



**NEAR EAST UNIVERSITY**

**FACULTY OF ARTIFICIAL INTELLIGENCE AND  
INFORMATICS**

**BSc PROGRAM in COMPUTER ENGINEERING**

**PROGRAM CATALOGUE**

**2025-2026 Academic Year**

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## **GENERAL INFORMATION ABOUT THE FACULTY**

### **1.1. Establishment of the Faculty**

#### **A) History of the Faculty and Academic Processes**

The Near East University Faculty of Artificial Intelligence and Informatics was established in 2025 and began its educational activities in the same year. Turkish citizens are admitted to the faculty's programs through the Student Selection and Placement Examination (OSYM) in line with the decision of the Council of Higher Education (YOK). The Faculty of Artificial Intelligence and Informatics was founded with the vision of becoming a leading institution in the contemporary world, integrating research and education through a student-centered approach and possessing international academic standards. The faculty offers undergraduate, master's, and doctoral programs in both Turkish and English.

#### **B) Educational Policy and Academic Goals**

The Faculty of Artificial Intelligence and Informatics, in line with its progressive educational philosophy, adopts a contemporary understanding of education and implements a student-centered teaching model that promotes interdisciplinary collaboration. The educational programs are structured in accordance with international standards. Graduates of the faculty make qualified contributions to the professional and academic fields as competent, innovative, and ethically responsible individuals in artificial intelligence, software engineering, and information technologies. The academic staff contribute to science and aim to lead technological advancement through their scientific research, R&D (Research and Development) activities, and community projects.

#### **C) Physical and Academic Infrastructure**

Located at the heart of the Near East University campus, the Faculty of Artificial Intelligence and Informatics possesses a modern infrastructure designed to support advanced education and training activities. The multi-story faculty building houses fully equipped classrooms, computer laboratories, seminar halls, academic and administrative offices, and shared facilities. Theoretical courses are delivered in 18 classrooms, all equipped with projection systems, smart boards, and internet connectivity. The faculty includes five fully equipped computer laboratories and specialized labs focused on artificial intelligence, machine learning, data science, cybersecurity, and software development, providing undergraduate and graduate students with opportunities for project-based and practical work.

The faculty collaborates with units such as the Near East University International Artificial Intelligence and IoT Research Center to strengthen its research activities. Dedicated offices are provided for academic staff, along with separate administrative units and a student affairs office. In addition, relaxation areas, meeting rooms, and club rooms are allocated to enhance students' social and academic engagement. These facilities enable students to gain hands-on experience alongside theoretical knowledge and to actively participate in university life.

#### **D) Accreditation and Quality Policy**

The Faculty of Artificial Intelligence and Informatics embraces national and international quality standards in its education and research processes and aims to enhance the quality of

education through a philosophy of continuous improvement. The faculty actively participates in national and international accreditation processes, regularly reviewing and improving its academic programs. These programs are structured with consideration for professional ethics, security standards, and current industry requirements, with the goal of equipping students with a strong and well-rounded professional foundation.

## **1.2. Mission, Vision, and Core Values of the Faculty**

### **A) Mission**

The Faculty of Artificial Intelligence and Informatics aims to achieve excellence and leadership at both regional and global levels in the fields of artificial intelligence and informatics education, research, and community engagement. Moving beyond traditional approaches focused solely on mathematics, physics, and the natural sciences, the faculty strives to cultivate a new generation of dynamic, innovative, and visionary professionals equipped with comprehensive scientific and practical

knowledge. Graduates are educated to be individuals who, guided by ethical values, can respond to the evolving demands of the global workforce and are ready to lead cutting-edge intelligent projects in the fields of informatics and data science.

### **B) Vision**

Drawing strength from its natural connection with technology, the Faculty of Artificial Intelligence and Informatics envisions creating a unique environment that fosters interdisciplinary collaboration, advanced research, and innovation. The faculty aims not only to contribute to scientific projects but also to educate professionals who will lead and shape these projects with a forward-looking perspective. In this context, it aspires to become a nationally and internationally recognized institution, pioneering both research and practical applications.

### **C) Core Values**

- 1). Embracing a culture of quality
- 2) Supporting continuous improvement
- 3) Ensuring sustainable development
- 4) Commitment to scientific and universal standards
- 5) Adherence to ethical values
- 6) Student-centered approach
- 7) Encouraging innovative thinking

## **1.3. Faculty's Aims and Objectives**

### **A) Goals of Faculty**

- To educate qualified engineers and researchers in the fields of artificial intelligence and informatics, contributing to scientific and technological development.
- To produce innovative solutions in education, research, and community service in accordance with ethical values and universal academic principles.

- To conduct interdisciplinary studies and strengthen scientific collaborations at national and international levels.
- To increase interaction with the public, private sector, and society, contributing to digital transformation and the information society.
- To develop students' analytical thinking, problem-solving, and lifelong learning skills.

## **B) Objectives of Faculty**

- To ensure that students acquire knowledge and skills in artificial intelligence and informatics according to international standards.
- To continuously improve educational programs to meet the technological needs of the era.
- To increase research activities and produce scientific projects at national and international levels.
- To strengthen knowledge and technology transfer through collaboration with public and private sectors.
- To increase societal contribution and promote AI literacy.
- To enhance graduates' analytical thinking, problem-solving, and innovative application competencies.

## **C) Goals and Objectives Covering the Field of Education**

**Goal 1:** To conduct pioneering research in artificial intelligence and informatics at national and international levels.

- Objective 1.1: To increase the number of scientific publications through interdisciplinary projects.
- Objective 1.2: To obtain support from national and international research funds.
- Objective 1.3: To establish and strengthen advanced research laboratories within the faculty.

**Goal 2:** To produce innovative AI solutions for regional and global challenges.

- Objective 2.1: To develop joint R&D projects with industry and public institutions.
- Objective 2.2: To carry out applied research in priority areas such as smart cities, health technologies, and cybersecurity.
- Objective 2.3: To strengthen technology transfer mechanisms to convert developed projects into societal benefits.

## **D) Goals and Objectives Covering the Field of Research**

**Goal 1:** To generate high-quality knowledge in artificial intelligence and informatics at a global level.

- Objective 1.1: To provide laboratory and project environments that enhance students' scientific research skills.
- Objective 1.2: To provide opportunities that strengthen the interdisciplinary researcher identity of academic staff.
- Objective 1.3: To support academic staff participation in national and international scientific events and conferences.

- Objective 1.4: To create academic support and funding mechanisms that encourage sustainable and innovative AI projects.

**Goal 2:** To develop innovative AI solutions addressing regional and global challenges.

- Objective 2.1: To develop joint R&D projects with industry, public institutions, and research centers.
- Objective 2.2: To conduct applied research in priority areas such as smart cities, health technologies, data science, and cybersecurity.
- Objective 2.3: To strengthen technology transfer mechanisms to convert scientific outputs into societal benefits.

## **E)Community and Educational Service-Oriented Goals and Objectives**

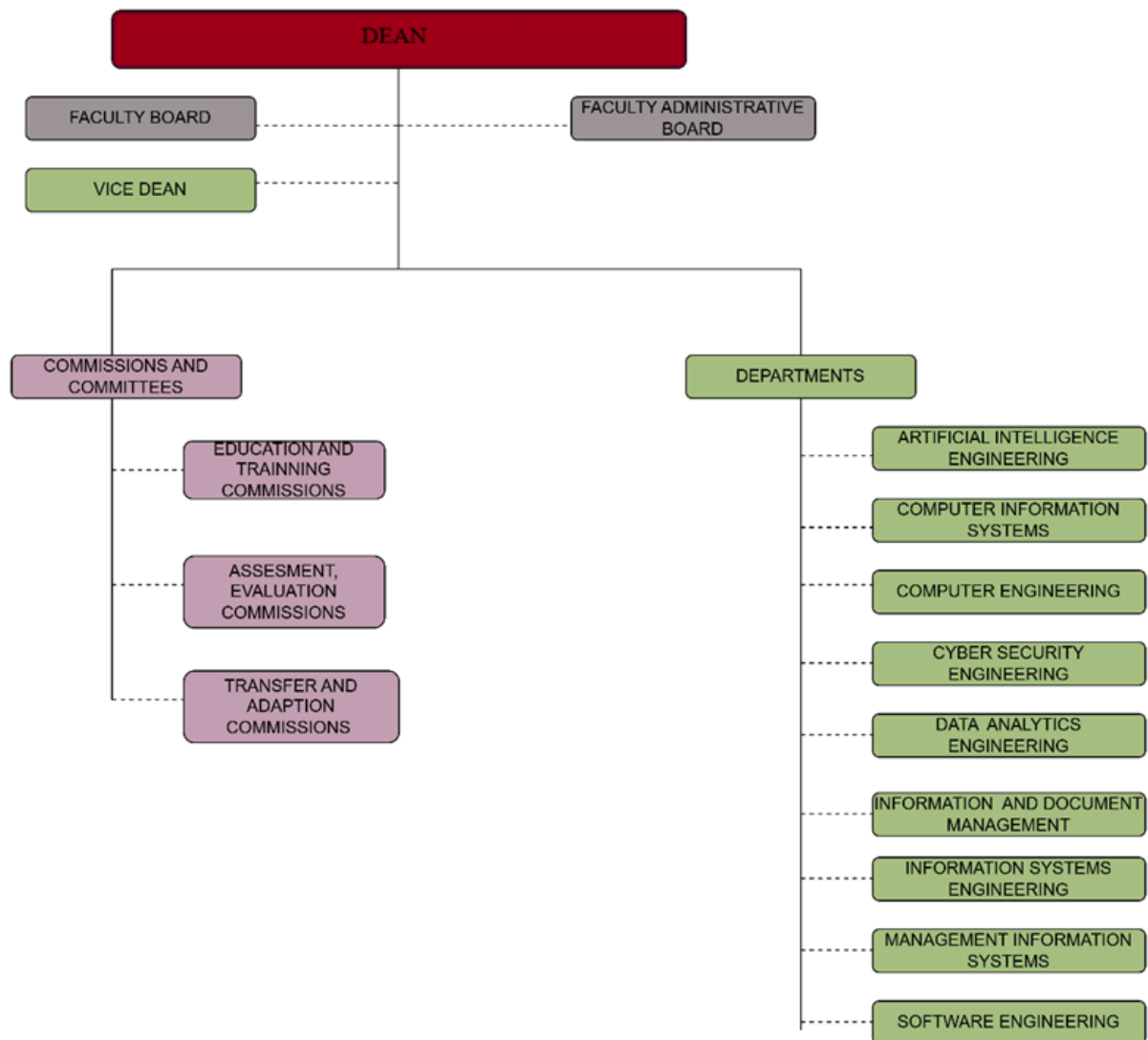
**Goal 1:** To educate qualified individuals who contribute to the digital transformation of society and promote AI literacy

- Objective 1.1: To support students' participation in community responsibility projects and technology-focused voluntary activities.
- Objective 1.2: To organize seminars, workshops, and training programs that increase digital awareness in society.
- Objective 1.3: To develop socially impactful projects in AI and informatics that address community needs.
- Objective 1.4: To establish joint education and certification programs with public and private sectors, contributing to technological development in society.

**Goal 2:** To provide sustainable educational services that support lifelong learning and professional development.

- Objective 2.1: To develop continuous education and certification programs that support the professional growth of academic staff and students.
- Objective 2.2: To accelerate society's adaptation to technology by conducting joint projects with local and international stakeholders.
- Objective 2.3: To create educational platforms with online and face-to-face content accessible to different age groups and professions.

### **1.4 Organizational Chart of the Faculty**



## 1.5. Faculty Administration

| Academic Title and Full Name  | Academic Unit of Appointment        |
|-------------------------------|-------------------------------------|
| Prof.Dr. Fadi Al-Turjman      | Software Engineering                |
| Prof.Dr. Nadire Çavuş         | Computer Informatics Systems        |
| Prof.Dr. Fezile Özdamlı       | Management Information Systems      |
| Prof. Dr. Gülsüm Aşıksoy      | Artificial Intelligence Engineering |
| Prof.Dr. Rahib Abiyev         | Computer Engineering                |
| Assoc.Dr. Idoko John Bush     | Cybersecurity Engineering           |
| Assoc.Dr. Seren Başaran       | Data Analytics Engineering          |
| Assist.Prof.Dr. Amr Abdelbari | Information Systems Engineering     |

## 1.6. Academic Staff of the Faculty

### A)Academic Structure and Departments

The Near East University Faculty of Artificial Intelligence and Informatics conducts innovative education and research activities in artificial intelligence, information technologies, and data science through its interdisciplinary structure.

The faculty consists of nine academic departments: Information and Records Management, Information Systems Engineering, Cybersecurity Engineering, Software Engineering, Computer Informatics Systems, Data Analysis Engineering, Artificial Intelligence Engineering, Management Information Systems, and Computer Engineering. Each department offers both theoretical and practical courses in its field, thereby contributing effectively to undergraduate and postgraduate programs.

Computer Engineering and Software Engineering provide fundamental engineering skills in software development, algorithms, and system design. Artificial Intelligence Engineering and Data Analysis Engineering offer advanced training and research opportunities in AI techniques, machine learning, and big data analytics. Cybersecurity Engineering focuses on network security, cryptography, and cyber defense. Information Systems Engineering and Management Information Systems emphasize the integration of information technologies into business and organizational structures. Computer Informatics Systems equips students with interdisciplinary IT infrastructure and solution development skills, while Information and Records Management contributes to society and academia through expertise in information resource management and digital archiving.

Through this comprehensive academic structure, the faculty delivers

technology-oriented, innovative, and research-based education, offering students a broad range of specializations and actively contributing to both regional and global scientific development.

### **B)Distribution and Strength of Academic Personnel**

| <b>No</b> | <b>Faculty/School/Institute</b>                    | <b>Department / Academic Unit</b>   | <b>Academic Staff (with Title)</b> |
|-----------|----------------------------------------------------|-------------------------------------|------------------------------------|
| <b>1</b>  | Faculty of Artificial Intelligence and Informatics | Software Engineering                | Prof.Dr. Fadi Al-Turjman           |
| <b>2</b>  | Faculty of Artificial Intelligence and Informatics | Computer Informatics Systems        | Prof.Dr. Nadire Çavuş              |
| <b>3</b>  | Faculty of Artificial Intelligence and Informatics | Management Information Systems      | Prof.Dr. Fezile Özdamlı            |
| <b>4</b>  | Faculty of Artificial Intelligence and Informatics | Artificial Intelligence Engineering | Prof. Dr. Gülsüm Aşıksoy           |
| <b>5</b>  | Faculty of Artificial Intelligence and Informatics | Computer Engineering                | Prof.Dr. Rahib Abiyev              |
| <b>6</b>  | Faculty of Artificial Intelligence and Informatics | Computer Engineering                | Assoc. Dr. Ahmet İlhan             |
| <b>7</b>  | Faculty of Artificial Intelligence and Informatics | Computer Engineering                | Assoc. Dr. Boran Şekeroğlu         |
| <b>8</b>  | Faculty of Artificial Intelligence and Informatics | Cybersecurity Engineering           | Assoc. Dr. Idoko John Bush         |
| <b>9</b>  | Faculty of Artificial Intelligence and Informatics | Computer Informatics Systems        | Assoc. Dr. Sahar Ebadinezhad       |
| <b>10</b> | Faculty of Artificial Intelligence and Informatics | Data Analysis Engineering           | Assoc. Dr.Seren Başaran            |

|    |                                                    |                                     |                                        |
|----|----------------------------------------------------|-------------------------------------|----------------------------------------|
| 11 | Faculty of Artificial Intelligence and Informatics | Information Systems Engineering     | Assist.Prof.Dr.Amr Abdelbari           |
| 12 | Faculty of Artificial Intelligence and Informatics | Computer Engineering                | Assist.Prof.Dr. Elbrus Bashir Imanov   |
| 13 | Faculty of Artificial Intelligence and Informatics | Artificial Intelligence Engineering | Assist.Prof.Dr. Kaan Uyar              |
| 14 | Faculty of Artificial Intelligence and Informatics | Computer Informatics Systems        | Assist.Prof.Dr. Nasim Ahmadzadeh       |
| 15 | Faculty of Artificial Intelligence and Informatics | Computer Engineering                | Assist.Prof.Dr. Ümit İlhan             |
| 16 | Faculty of Artificial Intelligence and Informatics | Software Engineering                | Assist.Dr. Oluwaseun Priscilla Olawale |
| 17 | Faculty of Artificial Intelligence and Informatics | Cybersecurity Engineering           | Dr. Galip Savaş İlgi                   |
| 18 | Faculty of Artificial Intelligence and Informatics | Data Analysis Engineering           | Dr. Hamit Altıparmak                   |
| 19 | Faculty of Artificial Intelligence and Informatics | Artificial Intelligence Engineering | Dr. Mohamad Ziad Altabel               |
| 20 | Faculty of Artificial Intelligence and Informatics | Computer Informatics Systems        | Dr. Oluwafemi Ayotunde Oke             |
| 21 | Faculty of Artificial Intelligence and Informatics | Information and Records Management  | Dr. Sıla Gürler                        |
| 22 | Faculty of Artificial Intelligence and Informatics | Software Engineering                | Dr.Ramiz Salama                        |
| 23 | Faculty of Artificial Intelligence and Informatics | Information Systems Engineering     | MSc. Çağrı Özkan                       |
| 24 | Faculty of Artificial Intelligence and Informatics | Information and Records Management  | MSc.Rabiu Abubakar                     |

|    |                                                    |                                     |                     |
|----|----------------------------------------------------|-------------------------------------|---------------------|
| 25 | Faculty of Artificial Intelligence and Informatics | Artificial Intelligence Engineering | MSc.Sinem Alturjman |
|----|----------------------------------------------------|-------------------------------------|---------------------|

### **C)Academic Development and Quality Policy**

Within the Near East University Faculty of Artificial Intelligence and Informatics, there are nine academic departments: Information and Records Management, Information Systems Engineering, Cybersecurity Engineering, Software Engineering, Computer Informatics Systems, Data Analysis Engineering, Artificial Intelligence Engineering, Management Information Systems, and Computer Engineering.

The faculty stands out with its expert and experienced academic staff. As of the 2024-2025 academic year, the faculty employs a total of 25 academic personnel, comprising 5 professors, 5 associate professors, 6 assistant professors (doctoral faculty members), 6 PhD holders, and 3 lecturers.

The academic staff provide education at both undergraduate and graduate levels and contribute to scientific studies in artificial intelligence and information technologies through their research. They also participate in various training and development programs to support their professional growth and play active roles in national and international projects, thereby advancing their individual academic careers and increasing the faculty's recognition at the international level.

## **2. COMPUTER ENGINEERING DEPARTMENT**

### **2.1 Brief History and Development of the Program**

The Bachelor of Science in Computer Engineering department at Near East University was originally established in 1990. **In 2015-2023, Bachelor of Science and Master of Science programs of the Computer Engineering department have been accredited by the Accreditation Agency for Degree Programmes in Engineering, Informatics, Natural Sciences and Mathematics (ASIIN) and Euro-Inf Framework Standards and Accreditation Criteria for Informatics Degree Programmes (EQANIE), headquartered in Germany.** This ASIIN accreditation confirms the high standards of our programmes and represents quality assurance of our educational programmes.

Currently, The Department of Computer Engineering operates under the administration of the Faculty of Artificial Intelligence and Informatics. The aims of the Computer Engineering Department are; bringing up experienced and knowledgeable individuals equipped with theoretical and practical information related to the discipline, and at the same time, bring up competent individuals who are able to contribute to the developments and research studies in the field, and be managers and instructors to continue to bring up qualified people who can effectively serve in this field.

By providing high quality educational opportunities, the vision of the Department of Computer Engineering is to be the most prestigious department of engineering so far is existing within the geography It is positioned in by bringing up individuals having the ability to adapt to the changes upcoming throughout the world, achieving international success and thus becoming leading engineers.

Computer Engineering Department currently offers the following programs:

- BS Degree in Computer Engineering
- MS Degree in Computer Engineering
- PhD. Degree in Computer Engineering

The department has two sections: English and Turkish, thus, the language of instruction is English and Turkish.

### **2.2. Type Of Education of the Program**

This is a First Cycle (Bachelor's Degree) program. The Bachelor's degree program is classified as a full time program. The Bachelor's degree program is aimed at Turkish, Cypriots and Foreign students, and teaching is given in English language. Studies in foreign universities can be included in the student's degree in NEU, if they are suitable to substitute studies in the NEU degree program. The Department of Computer Engineering also has foreign teachers and researchers, which makes it possible to widen both the educational and cultural perspective.

**Website of the higher education institute - <http://www.neu.edu.tr>**

### **2.3. Education Level of the Program**

Undergraduate curriculum according to Academic Regulation for Undergraduate Studies is arranged by the Computer Engineering Department and becomes effective upon the decision of the Engineering Faculty Board and approval of the University Senate.

The Computer Engineering Program takes four years and leads to a Bachelor's degree of Science in Computer Engineering. The Bachelor's degree requires the completion of 240 ECTS credits. The curriculum of the Bachelor's Degree in Computer Engineering was planned according to recommendations of ASIIN's subject-specific criteria (The Technical Committee 02, TC 02 and The Technical Committee 04, TC 04) and recommendations of The Association for Computing Machinery (ACM), and The Computer Society (IEEE-CS)<sup>1</sup>. The curriculum is classified into curricular categories represented in Table 1. A number of credits and a weight of a category in the program are indicated in Table 1. It includes studies of mathematics and science, studies of English and social science courses, studies of computer science and computer engineering obligatory courses, studies of computer engineering electives courses, bachelor's thesis and practical training.

| <b>Category</b>                         | <b>Notation</b> | <b>Credit</b> | <b>Weight, %</b> |
|-----------------------------------------|-----------------|---------------|------------------|
| Mathematics                             | MT              | 18            | 12.5             |
| Basic Science                           | BS              | 12            | 8.3              |
| English Composition & Social Science    | ECS             | 18            | 12.5             |
| Computer Science                        | CS              | 18            | 12.5             |
| Obligatory Computer Engineering Courses | OCE             | 55            | 38               |
| Elective Computer Engineering Courses   | ECE             | 18            | 12.5             |
| Bachelor's Thesis                       | BT              | 6             | 4.2              |
| Summer Internship                       | SI              | -             | -                |
| Total                                   |                 | 144           | 100              |

Each module of the program (Appendix E) is classified into curricular categories. Each module is assigned a number of semester credit hours, according to the number and types of formal activities within a given week. These are determined as follows:

- Lecture hours: presentation of material in a classroom setting
  - 3 credit hour = 4 “hour” of lecture per week
  - 2 credit hour = 2 “hour” of lecture per week
- Laboratory hours: formal experimentation in a laboratory setting
  - 1 credit hour = 2 “hour” laboratory session per week
- Recitation hours: problem-solving sessions, etc. in support of lecture material
  - 1 credit hour = 2 “hour” of recitation per week

The professional competence acquired in the required subject studies is further developed by elective subject choices. In the Bachelor's Degree Program the portion of elective studies is 13%. In exceptional cases, the elective subject can be chosen from other degree programs, if it is suitable for the degree. The application has to be

approved by the Head of Computer Engineering Department. With technical respect free electives on offer, students of the Bachelor's degree program may choose a certain specialization track to get a more distinguished qualifications profile.

**Teaching methods:** The Bachelor's program is full-time, on-campus program. The teaching methods applied in the Degree Program in Computer Engineering include lectures, classroom and laboratory exercises, computer training, different kinds of assignments, seminars, excursions, and Case-exercises. The courses also involve group and project work which train the social competences of the students.

The Department of Computer Engineering appreciates modern concepts and new methods in teaching and education methods that support educational objectives in addition to traditional methods. Traditional class attendance is compulsory for all courses except graduation projects. Problem solving sections of knowledge based courses are integrated with the theory sections.

The Department of Computer Engineering aims to reach its educational objectives by using several teaching methods. Both the traditional and modern teaching methods are employed at the department. Traditional teaching methods are face-to-face lectures and are class based, requiring all students to attend classes. At least 70% of class attendance is compulsory for all the courses. Lectures are conducted using standard computer based presentations in the form of pre-prepared slides. In addition, white boards and marker pens are used whenever necessary in order to explain difficult topics in greater detail, or to answer student questions. Students are encouraged to take notes during the presentations and ask questions if there are points that they are not clear about. Electronic copies of the slides are sent to students by e-mail after each class, and students are encouraged to go through the slides in their own time and make sure that they understand all presented information.

In addition to traditional teaching methods, a variety of other methods are used to support the teaching. Most computer based learning requires the use of computers as part of the learning process. Students use the departmental computer laboratories for their practical work in order to improve their practical skills. Students use computers in the laboratory under the supervision of either a teaching assistant or an instructor.

Educational methods used for the students can be classified into **teacher centered and student centered**. In **Teacher-Centered Approach**, the Teachers are the main authority figure. The primary role of the student is to passively receive information (via lectures and direct instruction) with an end goal of testing and assessment. It is the primary role of teachers to pass knowledge and information onto their students. In this model, teaching and assessment are viewed as two separate entities. Student learning is measured through objectively scored tests and assessments. In **Student-Centered Approach**, the teachers are an authority figure, teachers and students play an equally active role in the learning process. The teacher's primary role is to coach and facilitate student learning and overall comprehension of material. Student learning is measured through both formal and informal forms of assessment, including group projects, student portfolios, and class participation. Teaching and assessments are connected; student learning is continuously measured during teacher instruction.

Commonly used teaching methods may include class participation, demonstration, recitation, memorization, or combinations of these.

The students who successfully complete the program are awarded the degree of Bachelor of Science in Computer Engineering.

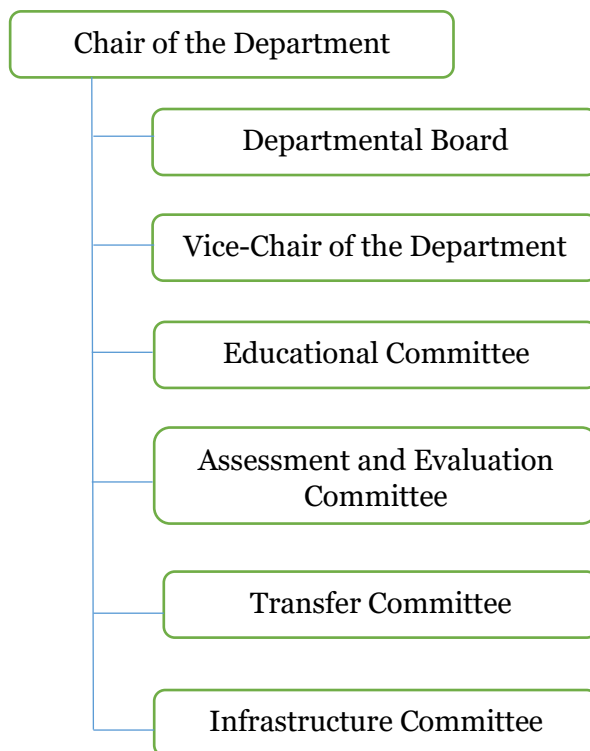
#### **2.4. Language of Education**

The students are studying in English

#### **2.5. Duration**

Duration of the Program is 4 years (excluding one year of English preparatory class for English programme), 2 semesters per year, 16 weeks per semester

#### **2.6. Organisational Chat**



### 2.7. Program Coordinator

Prof. Dr. Rahib H.Abiyev (Chairperson)

Phone: 00 90 392 223 64 64

E-mail: [rahib.abiyev@neu.edu.tr](mailto:rahib.abiyev@neu.edu.tr)

### 2.8. Program Management and Academic Staff

| No | Academic Staff                 |            |
|----|--------------------------------|------------|
| 1  | Prof.Dr.Rahib Abiyev           | Chair      |
| 2  | Assist.Prof.Dr. Umit Ilhan     | Vice-chair |
| 3  | Asocc.Prof.Dr. Boran Şekeroğlu | Lecturer   |
| 4  | Asocc.Prof.Dr. John Idoko Bush | Lecturer   |
| 5  | Assist.Prof.Dr. Elbrus Imanov  | Lecturer   |
| 6  | Dr. Ahmet Ilhan                | Lecturer   |
| 7  | Dr.Hamit Altiparmak            | Lecturer   |

## 3. MISSION AND VISION OF THE PROGRAM

### 3.1. Mission

**Mission** of Computer Engineering undergraduate and graduate programs is to provide students with an understanding of the fundamental principles of computer engineering, the skills needed to solve the complex engineering problems of modern society and the ability to continue to learn and develop throughout their careers. Second, through its research programs, the department contributes to the development and progress of computer technology and transfer research results to industry through publications.

The understanding of the fundamental principles of computer engineering includes an understanding of design methodologies for digital systems, computer architecture and integrated circuits, algorithms and data structures, operating systems, and a wide variety of software applications across various computer languages. There is an excellent opportunity in laboratories to put the theory and design methods into practice by using digital components, design simulators, and microcontrollers.

### 3.2. Vision

**Vision** of Computer Engineering BSc program is to be accredited nationally and internationally, communicate with other universities and the private sector consistently, provide quality education, such as in an international level and be one of the best computer engineering departments.

## 4. CORE VALUES of COMPUTER ENGINEERING PROGRAM

Core values for a **Computer Engineering program** define the guiding principles, attitudes, and ethical standards that shape how students, faculty, and graduates approach technology,

learning, and professional practice. Below are common and meaningful **core values** tailored to Computer Engineering:

**1. Integrity and Ethics**

- Upholding honesty, responsibility, and transparency in all academic, professional, and research activities.
- Respecting intellectual property and adhering to professional codes of conduct in technology development and use.

**2. Innovation and Creativity**

- Encouraging curiosity, imagination, and original thinking in designing and improving computing systems.
- Fostering an environment that supports experimentation and continuous innovation.

**3. Excellence and Lifelong Learning**

- Striving for academic and professional excellence in both theoretical and practical aspects of computer engineering.
- Emphasizing continuous learning to adapt to rapid technological advancements.

**4. Collaboration and Teamwork**

- Promoting effective communication and cooperation within multidisciplinary teams.
- Valuing diverse perspectives and collective problem-solving in engineering projects.

**5. Social Responsibility and Sustainability**

- Developing technologies that positively impact society and contribute to sustainable development.
- Considering the ethical, environmental, and social implications of engineering decisions.

**6. Technical Competence and Professionalism**

- Building strong foundations in hardware, software, and systems integration.
- Maintaining professionalism, accountability, and respect in academic and workplace environments.

**7. Global and Cultural Awareness**

- Recognizing the global impact of technology and appreciating cultural diversity in engineering solutions.
- Preparing graduates to work effectively in international and multicultural contexts.

**8. Leadership and Service**

- Inspiring initiative, responsibility, and leadership in solving complex engineering challenges.
- Encouraging community engagement and the use of technology for the public good.

**5. FIELDS OF ACTIVITY OF THE PROGRAM**

The fields of activity of a Computer Engineering program describe the professional areas, industries, and roles where graduates can apply their knowledge and skills. These fields typically combine hardware, software, and system integration aspects of computing.

Below fields of activity are presented

- **Computer Hardware Design and Development:** Design and testing of digital circuits, microprocessors, and embedded systems; Development of computer architectures, hardware interfaces, and integrated systems.
- **Software Engineering and Development:** Design, implementation, testing, and maintenance of software systems and applications; Involvement in full software development life cycles, from requirements analysis to deployment.
- **Computer Networks and Communication Systems:** Design, configuration, and management of wired and wireless networks; Work in network security, Internet of Things (IoT), and cloud-based systems.
- **Artificial Intelligence and Machine Learning:** Development of intelligent systems for data analysis, automation, and decision-making; Applications in image recognition, natural language processing, and robotics.
- **Cybersecurity:** Design and implementation of secure systems to protect data, networks, and infrastructure; Work in cryptography, risk assessment, and ethical hacking.
- **Embedded and Real-Time Systems:** Development of hardware–software integrated solutions for automotive, medical, and industrial devices; Design of real-time control and monitoring systems.
- **Data Science and Big Data Analytics:** Collection, processing, and interpretation of large-scale data for decision support and business intelligence; Implementation of database systems and data-driven applications.
- **Cloud Computing and Distributed Systems:** Development and management of scalable, distributed platforms and cloud-based infrastructures; Focus on virtualization, parallel computing, and performance optimization.
- **Robotics and Automation:** Design of robotic systems integrating sensors, actuators, and control algorithms; Application of AI and vision systems for autonomous operation.
- **Computer Vision and Image Processing:** Development of algorithms for object detection, pattern recognition, and visual data analysis; Applications in medical imaging, surveillance, and industrial inspection.
- **Control Systems and Digital Signal Processing:** Design of control algorithms and signal processing systems for communication and automation; Applications in audio, video, and sensor-based technologies.
- **Information Systems and Databases:** Design, implementation, and management of information systems for enterprises and organizations; Focus on data integrity, security, and performance.
- **Research and Development (R&D):** Participation in academic and industrial research projects; Development of new technologies, algorithms, and computing architectures.

## **6. OBJECTIVES AND GOALS**

### **6.1. Program Educational Objectives and goals**

The educational objectives of the Degree Program in Computer Engineering reflect the mission of Near East University. The Bachelor of Science program in Computer Engineering prepares the students to achieve the following career and professional objectives.

- To acquire a strong foundation in Computer Engineering area relevant to the current needs of industry to allow them to successfully compete for demanding and high quality jobs

- Analyze problems, propose algorithmic solutions, and implement them correctly and efficiently by applying their knowledge of mathematics, computing, systems and development tools.
- Propose engineering solutions using the information and communication technologies for the related problems of industry and government.
- To acquire clear communication abilities, ethical and social responsibilities for teamwork.
- Make positive contributions to their community and society by applying skills and abilities learned during their undergraduate program in computer engineering
- Improve knowledge and skills through lifelong learning and graduate studies.

The program's goal is to equip its graduates with both the fundamental scientific principles that underpin the key computing technologies in use today and the engineering skills that enable those principles to be applied in practice. Upon graduation, students should be equipped to pursue a career as computer professionals or, if they so wish, to pursue further academic studies. The graduates will be professionals who can be flexible and integrate in a relatively short time into a wide-range of different sectors of the industry.

Program Goals is to:

- Provide the public and private sectors with qualified computer engineering professionals.
- Provide computer engineering graduates with the necessary knowledge in fundamental theories, techniques, and tools to solve computer engineering problems, design hardware/software systems and improve their performance.
- Continuously update and expand their knowledge and skills to adapt to emerging technologies and pursue professional growth through advanced studies, certifications, or self-learning.
- Demonstrate high ethical standards, professional integrity, and social responsibility in applying computer engineering principles for the benefit of society and the environment.
- Work productively as individuals and as members or leaders of multidisciplinary teams, demonstrating effective communication and collaboration skills.

## **6.2. Research Objectives and Goals of the Computer Engineering Program**

Research objectives guide faculty, graduate students, and research groups toward advancing technology and addressing real-world problems through scientific inquiry.

- Conduct original and high-quality research that contributes to the advancement of computer engineering and emerging technologies in hardware, software, and intelligent systems.
- Foster collaboration across engineering, science, and applied disciplines to develop integrated solutions for complex technological and societal challenges.

- Address critical issues in information technologies, sustainability, energy efficiency, cybersecurity, and digital transformation that align with national and global development goals.
- Strengthen the program's research environment through the establishment of advanced laboratories, research centers, and partnerships with industry and academic institutions.
- Engage undergraduate and graduate students in research projects to develop analytical thinking, creativity, and independent problem-solving skills.
- Support the dissemination of research outcomes through publications in reputable journals, conference presentations, patents, and technology transfer initiatives.
- Encourage research that leads to innovative products, prototypes, and startups, contributing to technological advancement and economic development.

## 7. PROGRAM COMPETENCIES

### 7.1. Program Outcomes

| <b><i>Program Learning Outcomes</i></b> |                                                                                                                                                                                                                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                                       | To have adequate knowledge in Mathematics, Science and Computer Engineering; to be able to use theoretical and applied information in these areas on complex engineering problems.                                                                                             |
| 2                                       | To be able to identify, define, formulate, and solve complex Computer Engineering problems; to be able to select and apply proper analysis and modeling methods for this purpose.                                                                                              |
| 3                                       | To be able to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the requirements; to be able to apply modern design methods for this purpose.                                                           |
| 4                                       | To be able to devise, select, and use modern techniques and tools needed for analysis and solution of complex problems in Computer Engineering applications; to be able to use information technologies effectively.                                                           |
| 5                                       | To be able to design and conduct experiments, gather data, analyze and interpret results for investigating complex engineering problems or Computer Engineering research topics.                                                                                               |
| 6                                       | To be able to work efficiently in Computer Engineering disciplinary and multi-disciplinary teams; to be able to work individually.                                                                                                                                             |
| 7                                       | To be able to communicate effectively, both orally and in writing; to be able to author and comprehend written reports, to be able to prepare design and implementation reports, to present effectively, to be able to give and receive clear and comprehensible instructions. |

|    |                                                                                                                                                                                                                                                                              |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8  | To have knowledge about global and social impact of Computer Engineering practices on health, environment, and safety; to have knowledge about contemporary issues as they pertain to engineering; to be aware of the legal ramifications of Computer Engineering solutions. |
| 9  | To be aware of ethical behavior, professional and ethical responsibility; to have knowledge about standards utilized in engineering applications.                                                                                                                            |
| 10 | To have knowledge about industrial practices such as project management, risk management, and change management; to have awareness of entrepreneurship and innovation; to have knowledge about sustainable development.                                                      |
| 11 | To be able to collect data in the area of Computer Engineering, and to be able to communicate with colleagues in a foreign language. ("European Language Portfolio Global Scale", Level B1)                                                                                  |
| 12 | To be able to speak a second foreign language at a medium level of fluency efficiently.                                                                                                                                                                                      |
| 13 | To recognize the need for lifelong learning; to be able to access information, to be able to stay current with developments in science and technology; to be able to relate the knowledge accumulated throughout the human history to Computer Engineering.                  |

## 7.2.Relationship between Program Learning Outcomes and NQF Qualifications

### A. Structure of an NQF Qualification

- 1). Qualification Title: Bachelor's Degree in Computer Engineering
- 2). Level of Qualification: First Cycle / Bachelor's Degree
- 3). Qualification Type: Cycle: First Cycle (Undergraduate)/ Computer Engineering
- 4). Admission Requirements: Completion of secondary education (high school diploma or equivalent); Successful performance in national university entrance examination (e.g., YKS in Türkiye).
- 5). Qualification Requirements and Regulations
  - Successful completion of all courses, laboratories, and design projects in the approved curriculum.
  - Minimum cumulative GPA (e.g., 2.00/4.00).
  - Completion of required internship(s) and graduation project.
  - Total credits: 240 ECTS (typically 8 semesters).
- 6) Profile of the Program: A broad-based engineering program that integrates hardware and software knowledge to design, analyze, and develop computer systems, networks, and intelligent technologies. It combines theoretical foundations, applied laboratory work, and engineering design to prepare graduates for professional practice and lifelong learning.
- 7) Learning Outcomes (presented in 7.1)

- 8) Occupational Profiles of Graduates: Computer engineers, software developers, system analysts, hardware designers, network engineers, data scientists, or researchers. They may find employment in IT companies, telecommunications, manufacturing, defense, and public institutions, or pursue graduate studies
- 9) Access to Further Studies: Eligible for Master's Degree (Second Cycle) programs in Computer Engineering, Electrical–Electronics Engineering, Artificial Intelligence, and related fields.
- 10) Assessment and Grading: Based on midterm and final exams, laboratory work, design projects, assignments, and practical evaluations; Uses a letter grading system corresponding to a 4.00 GPA scale.
- 11) Mode of Study Full-time (face-to-face) education.
- 12) Program Director: Prof.Dr.Rahib Abiyev, Head of Department, Faculty of Engineering, Near East University

### 7.3.Relationship between Course & Program Outcomes Matrix

|                         |                                  | Program Outcomes |   |   |   |   |   |   |   |   |    |    |    |    |
|-------------------------|----------------------------------|------------------|---|---|---|---|---|---|---|---|----|----|----|----|
| Course Code             | Course Name                      | 1                | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 1st Year - 1st Semester |                                  |                  |   |   |   |   |   |   |   |   |    |    |    |    |
| ENG 101                 | English I                        | -                | - | - | - | - | - | - | 2 | - | -  | 4  | 5  | 3  |
| COM 001                 | Computer Engineering Orientation | 4                | 2 | - | 1 | - | 3 | - | 3 | 3 | 3  | -  | -  | 1  |
| CAM100                  | Campus Orientation               | -                | - | - | - | - | - | - | 1 | - | -  | 1  | -  | 3  |
| MTH 101                 | Calculus I                       | 5                | 4 | 4 | 2 | - | 2 | - | - | - | -  | -  | -  | 2  |
| PHY 101                 | General Physics I                | 5                | 4 | 4 | 2 | - | 2 | - | - | - | -  | -  | -  | 2  |
| AII 106                 | Introduction to Programming      | 2                | 5 | 4 | 5 | 4 | 4 | - | - | - | -  | -  | -  | -  |
| CHM 101                 | General Chemistry                | 5                | 4 | - | 2 | - | 2 | - | - | - | -  | -  | -  | 2  |
| YIT101                  | Turkish I for Foreigners         | -                | - | - | - | - | - | 5 | - | - | -  | -  | -  | 3  |
| 1st Year - 2nd Semester |                                  |                  |   |   |   |   |   |   |   |   |    |    |    |    |
| ENG 102                 | English II                       | -                | - | - | - | - | - | - | 2 | - | -  | 4  | 5  | 3  |
| AII 104                 | Discrete Structures              | 5                | 4 | 3 | 4 | 3 | 2 | - | - | - | -  | -  | -  | -  |
| MTH 102                 | Calculus II                      | 5                | 4 | 4 | 2 | 2 | - | - | - | - | -  | -  | -  | 2  |
| PHY 102                 | General Physics II               | 5                | 4 | 4 | 2 | 2 | - | - | - | - | -  | -  | -  | 2  |
| AII 102                 | Programming &Problem Solving     | 3                | 3 | 5 | 5 | 4 | 3 | - | - | - | -  | -  | -  | -  |
| YIT102                  | Turkish for Foreigners           | -                | - | - | - | - | - | - | 1 | - | -  | 1  | -  | 3  |
| GEC351                  | 21st Centry Skills               | -                | - | - | - | - | 1 | - | 2 | 4 | 3  | -  | -  | 3  |
|                         |                                  |                  |   |   |   |   |   |   |   |   |    |    |    |    |
| 2nd Year - 1st Semester |                                  |                  |   |   |   |   |   |   |   |   |    |    |    |    |
| AII 001                 | Logic Design                     | 4                | 5 | 4 | 3 | 5 | 2 | - | - | - | -  | -  | -  | 2  |

|                         |                                                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------------------------|----------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AII 201                 | Data Structures& Algorithms                                                | 4 | 4 | 5 | 4 | 4 | 1 | - | - | - | - | - | - | 1 |
| AII 204                 | Electrical Circuits                                                        | 5 | 3 | 4 | 3 | 3 | 1 | - | - | - | - | - | - | 1 |
| MTH 201                 | Differential Equations                                                     | 5 | 3 | 4 | 4 | 4 | - | - | - | - | - | - | - | 1 |
| AIT 103                 | Atatürk Principles & Reforms I                                             | - | - | - | - | - | - | 2 | 5 | 3 | - | - | - | 3 |
| MTH 113                 | Linear Algebra                                                             | 5 | 4 | 3 | 2 | 1 | - | - | - | - | - | - | - | 1 |
| 2nd Year - 2nd Semester |                                                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |
| AII 202                 | Database Management Systems                                                | 3 | 3 | 4 | 4 | 4 | - | - | - | - | - | - | - | - |
| ENG 201                 | English Communication Skills                                               | - | - | - | - | - | - | - | - | - | - | 4 | 5 | 3 |
| AII203                  | Computer Architecture and Organization                                     | 5 | 3 | 3 | 4 | 2 | - | - | - | - | - | - | - | 1 |
| AII 205                 | Basic Electronics                                                          | 4 | 3 | 5 | 2 | 3 | - | - | - | - | - | - | - | 3 |
| RE                      | Introduction to Molecular Biology or any of Mat.& Basic Sciences Electives | 5 | 4 | 1 | 4 | 3 | - | - | - | - | - | - | - | - |
| AIT104                  | Atatürk Principles & Reforms II                                            | - | - | - | - | - | - | 2 | 5 | 3 | - | - | - | 3 |
| COM 200                 | Summer Training I                                                          | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 3rd Year - 1st Semester |                                                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |
| COM 344                 | Automata Theory                                                            | 5 | 4 | 4 | 3 | 3 | 2 | - | - | - | - | - | - | - |
| AII 302                 | Operating Systems                                                          | 4 | 4 | 4 | 3 | 3 | 2 | - | - | - | - | - | - | - |
| COM 362                 | Signals and Systems for Computer Engineers                                 | 5 | 5 | 4 | 5 | 3 | 2 | - | - | - | - | - | - | - |
| COM 339                 | Programming Language Concepts                                              | 2 | 5 | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - |
| MTH 251                 | Probability and Statistics                                                 | 5 | 2 | - | 2 | 1 | - | - | - | - | - | - | - | 1 |
| CAR100                  | Career Planning                                                            | - | - | - | - | - | - | 1 | - | - | 1 | - | - | 3 |
| 3rd Year - 2nd Semester |                                                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |
| AII351                  | Embedded Systems                                                           | 5 | 4 | 4 | 4 | 2 | 2 | - | - | - | - | - | - | - |
| AII 303                 | Data Communications and Networking                                         | 2 | 5 | 2 | 4 | 4 | 2 | - | - | - | - | - | - | - |
| AII 002                 | Systems Simulation                                                         | 2 | 5 | 2 | 3 | - | 2 | - | - | - | - | - | - | - |
| COM 333                 | Operational Research                                                       | 5 | 5 | 5 | 5 | 2 | 2 | - | - | - | - | - | - | - |
| COM 382                 | Real Time Systems                                                          | 5 | 4 | 4 | 4 | 2 | 1 | - | - | - | - | - | - | 1 |
| COM 300                 | Summer Training II                                                         | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 4th Year - 1st Semester |                                                                            |   |   |   |   |   |   |   |   |   |   |   |   |   |
| COM 490                 | Engineering Design I                                                       | 4 | 5 | 5 | 4 | 5 | 5 | - | 2 | 2 | 2 | - | - | 5 |
| AII 003                 | Software Engineering                                                       | 2 | 4 | 5 | 4 | 3 | 4 | - | - | - | - | - | - | 2 |
| TE                      | Technical Elective                                                         | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TE                      | Technical Elective                                                         | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TE                      | Technical Elective                                                         | - | - | - | - | - | - | - | - | - | - | - | - | - |
| CHC100                  | Cyprus: History and Culture                                                | - | - | - | - | - | 1 | 2 | 1 | 3 | 4 | 1 | 1 | 4 |

| 4th Year - 2nd Semester                    |                                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|--------------------------------------------|-------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| COM 491                                    | Engineering Design II                           | 4 | 5 | 5 | 4 | 5 | 5 | - | - | 2 | 2 | 3 | - | 5 |  |
| AII426                                     | Economics For Engineers                         | 2 | - | - | - | - | - | - | 2 | 2 | - | 2 | - | 5 |  |
| AII439                                     | Occupational Health and Safety                  | - | - | 2 | 3 | - | 1 | 1 | 5 | 4 | 4 | - | - | 3 |  |
| TE                                         | Technical Elective                              | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| TE                                         | Technical Elective                              | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| FE                                         | Free Elective                                   | - | - | - | - | - | - | - | - | - | - | - | - | - |  |
| Technical (Field-Related) Elective Courses |                                                 |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| AII 005                                    | Internet Programming                            | 4 | 3 | 3 | 3 | - | 2 | - | - | - | - | - | - | - |  |
| AII 413                                    | Introduction to Artificial Intelligence         | 4 | 4 | 4 | 4 | 4 | - | 2 | - | - | - | - | - | - |  |
| AII415                                     | Decision Making                                 | 4 | 4 | 4 | 4 | 4 | - | 2 | - | - | - | - | - | - |  |
| AII 006                                    | Web Design and Programming                      | 3 | - | 3 | 4 | - | - | - | - | - | - | - | - | - |  |
| AII 402                                    | Computer Graphics                               | 4 | 3 | 2 | - | - | - | - | - | - | - | - | - | - |  |
| AII 411                                    | Digital Signal Processing                       | 4 | 3 | 4 | 3 | 1 | - | - | - | - | - | - | - | - |  |
| AII 007                                    | Multimedia Systems                              | 3 | 3 | 4 | 3 | 4 | 3 | - | - | - | - | 2 | - | - |  |
| COM 447                                    | Advanced Operating System                       | 2 | 1 | 3 | 5 | 3 | - | - | - | 3 | - | - | - | - |  |
| COM448                                     | Cryptography and Network Security               | 2 | 2 | 3 | 4 | - | 3 | - | - | - | - | - | - | - |  |
| AII 408                                    | Advanced Object Oriented Programming            | 4 | 4 | 4 | 5 | 2 | 4 | - | - | - | - | 3 | - | 4 |  |
| AII 409                                    | Object Oriented Programming II                  | 4 | 4 | 4 | 5 | 2 | - | - | - | - | - | - | - | - |  |
| COM447                                     | Advanced Operating System                       | 2 | 2 | 3 | 4 | 2 | 3 | - | - | - | - | - | - | - |  |
| AII 404                                    | Neural Networks                                 | 4 | 5 | 4 | 3 | 1 | - | - | - | - | - | - | - | - |  |
| COM 410                                    | Parallel Computer Architecture                  | 3 | 5 | 4 | - | - | 4 | - | - | - | - | - | - | - |  |
| AII 401                                    | Microprocessor Systems                          | 4 | 3 | 4 | 4 | - | - | - | - | - | - | - | - | - |  |
| COM414                                     | Digital Control Systems                         | 5 | 5 | 4 | 3 | 3 | 2 | - | - | - | - | - | - | - |  |
| AII 417                                    | Mobile Computing                                | 4 | 3 | 4 | 4 | - | 3 | - | - | - | - | - | - | - |  |
| AII 406                                    | System Programming                              | 3 | 3 | 3 | 4 | 2 | - | - | - | - | - | - | - | - |  |
| COM 452                                    | Introduction to Parallel Computing              | 2 | 4 | 5 | 3 | 3 | - | - | - | - | - | - | - | - |  |
| COM 454                                    | Advanced Computer Architecture and Organization | 2 | 4 | 5 | 3 | 4 | - | - | - | - | - | - | - | - |  |
| COM 416                                    | Computer Networks                               | 2 | 5 | 4 | 3 | 2 | - | - | - | - | - | - | - | - |  |
| COM 430                                    | Programming Languages I                         | 5 | 4 | 4 | 5 | 2 | 4 | - | - | - | - | 3 | - | 3 |  |
| AII 407                                    | Programming Languages II                        | 3 | 4 | 4 | 4 | 4 | 3 | - | - | - | - | 2 | - | - |  |
| COM 414                                    | Digital Control Systems                         | 5 | 5 | 5 | 5 | - | 3 | - | - | - | - | - | - | - |  |
| AII 405                                    | Computer Hardware                               | 4 | 4 | 4 | 4 | 3 | - | - | - | - | - | - | - | - |  |
| COM315                                     | Algorithms                                      | 5 | 5 | 4 | 4 | 3 | - | - | - | - | - | - | - | - |  |

|         |                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------|----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AII 412 | Database Applications            | 4 | 5 | 3 | 5 | 3 | 2 | - | - | - | - | - | - | - |
| AII 419 | Digital Image Processing         | 2 | 4 | 4 | 3 | 3 | 1 | - | - | - | - | - | - | - |
| COM 471 | Hardware Design using FPGAs      | 4 | 4 | 4 | 5 | 2 | 4 | - | - | - | - | 3 | - | 2 |
| AII 415 | Decision Making                  | 5 | 4 | 4 | 4 | 4 | - | 2 | - | - | - | - | - | - |
| AII423  | Introduction to Robotic Systems  | 4 | 4 | - | 3 | 3 | 1 | - | - | - | - | - | - | - |
| AII445  | Introduction to Machine Learning | 5 | 4 | 5 | 4 | 4 | - | 2 | - | - | - | - | - | - |
| AII341  | Computer Network Design          | 2 | 2 | 3 | 2 | 2 | 4 | - | 1 | - | - | - | - | 2 |

\* 1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

### **-Occupational Profiles Of Graduates**

Graduates of Computer Engineering program may work in the Information Technologies department of a bank, a university, a hospital, a public institution, or a private company. Additionally, they may be employed as system analyst, application programmer, data base administrator, network designer, security administrator, system evaluator, system programmer, system designer, standard and methods inspector, final user support specialist in production, marketing, financial affairs, human resources and/or research and development departments of a production company.

#### **- Access To Further Studies**

The students graduating from this program may apply to graduate programs.

## **8.COURSE LIST**

### **8.1.Program Structure**

The undergraduate program in Computer Engineering consists of 47 courses with 240 ECTS credits in total.

There are at least 5 courses in each semester, excluding common compulsory courses and elective courses.

In each program, there are common compulsory courses identified by the Higher Education Council of Turkey (YÖK) and other common courses determined by the University Senate.

Beginning from the junior (third) year, elective courses are anticipated in each semester.

25% of the elective courses are taken from other faculties.

There are at least 7 elective courses in each undergraduate program.

### **8.2. Distribution of the Courses**

| COURSES OFFERED THROUGHOUT THE UNIVERSITY |                    |                                                                                                                                                                |
|-------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Common University Courses                 | Campus Orientation | The students are registered to this course at the beginning of the first semester of the freshman year to familiarize them with the campus life at NEU.        |
|                                           | Career Planning    | The students are registered to this course at the beginning of their second semester of the freshman year to help them prepare for work life after graduation. |

|                                         |                                                                                                                                                                    |                                                                                                                                                                                       |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                         | Cyprus History and Culture                                                                                                                                         | This course is taken by students in their freshmen year and it aims to help them to familiarize them with the local history and culture.                                              |
| Common Compulsory Courses (YÖK Courses) | Turkish Language I-II<br>(Turkish for Foreigners I & II to replace this course for international students)<br>Principles of Atatürk and History of Revolution I-II | These are the compulsory courses which are required to be offered in all of the associate and undergraduate programs in Turkey according to the Higher Education Legislation.         |
|                                         | Information Technologies                                                                                                                                           | This course is anticipated in all the associate and undergraduate programs in Turkey in order to make the students gain the qualifications related to basic information technologies. |
|                                         | Foreign Language (ENGLISH) I & II                                                                                                                                  | This course is offered in the first and second semester and conducted according to the program curriculum of each faculty.                                                            |

### 8.3. Semester-wise Distribution of Courses

List of courses of taken each semester are given below.

#### BSc in Computer Engineering

##### 1st Semester

| CODE            | COURSE NAME                                   | DERS ADI                               | C/E | T  | P | C  | E  | prerequisite |
|-----------------|-----------------------------------------------|----------------------------------------|-----|----|---|----|----|--------------|
| COM106          | Introduction to Programming                   | Programlamaya Giriş                    | C   | 3  | 2 | 4  | 6  |              |
| CHM101          | General Chemistry                             | Genel Kimya                            | C   | 3  | 2 | 4  | 5  |              |
| ENG101          | English I                                     | İngilizce I                            | C   | 3  | 0 | 2  | 3  |              |
| MTH101          | Calculus I                                    | Matematik I                            | C   | 4  | 0 | 4  | 5  |              |
| PHY101          | General Physics I                             | Genel Fizik I                          | C   | 3  | 2 | 4  | 5  |              |
| CAM100          | Campus Orientation                            | Kampüse Uyum                           | C   | 2  | 0 | 0  | 2  |              |
| YİT101 / TUR101 | Turkish for Foreigners I / Turkish Language I | Yabancılar için Türkçe I / Türk Dili I | C   | 2  | 0 | 2  | 2  |              |
| COM001          | Computer Engineering Orientation              | Bilgisayar Mühendisliği Yönlendirme    | C   | 2  | 0 | 0  | 2  |              |
| Total           |                                               |                                        |     | 22 | 6 | 20 | 30 |              |

##### 2nd Semester

| CODE   | COURSE NAME                   | DERS ADI                  | C/E | T | P | C | E |        |
|--------|-------------------------------|---------------------------|-----|---|---|---|---|--------|
| AII104 | Discrete Structures           | Ayrık Yapılar             | C   | 3 | 0 | 3 | 5 |        |
| AII102 | Programming & Problem Solving | Programlama ve Soru Çözme | C   | 3 | 2 | 4 | 6 | AII106 |
| ENG102 | English II                    | İngilizce II              | C   | 3 | 0 | 2 | 3 | ENG101 |

|                    |                                                    |                                                        |     |    |   |    |    |        |
|--------------------|----------------------------------------------------|--------------------------------------------------------|-----|----|---|----|----|--------|
| MTH102             | Calculus II                                        | Matematik II                                           | C   | 4  | 0 | 4  | 6  | MTH102 |
| PHY102             | General Physics II                                 | Genel Fizik II                                         | C   | 3  | 2 | 4  | 6  | PHY101 |
| YİT102 /<br>TUR102 | Turkish for Foreigners<br>II / Turkish Language II | Yabancılar için Türkçe II /<br>Türk Dili II            | C   | 2  | 0 | 2  | 2  | YIT101 |
| GEC351             | 21st Century Skills                                | 21. Yüzyıl Becerileri                                  | E   | 2  | 0 | 0  | 2  |        |
|                    |                                                    |                                                        |     |    |   |    |    |        |
| Total              |                                                    |                                                        |     | 20 | 4 | 19 | 30 |        |
|                    | 3rd Semester                                       |                                                        |     |    |   |    |    |        |
| CODE               | COURSE NAME                                        | DERS ADI                                               | C/E | T  | P | C  | E  |        |
| AII001             | Logic Design                                       | Sayısal Mantık                                         | C   | 3  | 2 | 4  | 6  | AII104 |
| AII201             | Data Structures&<br>Algorithms                     | Veri Yapıları ve<br>Algoritmalar                       | C   | 3  | 2 | 4  | 6  | AII102 |
| AII204             | Electrical Circuits                                | Elektrik Devreleri                                     | C   | 3  | 0 | 3  | 5  | PHY102 |
| MTH201             | Differential Equations                             | Diferansiyel Denklemler                                | C   | 4  | 0 | 4  | 6  | MTH101 |
| AİT103 /<br>AİT101 | Atatürk Principles &<br>Reforms I                  | Atatürk Prensipleri ve<br>Reformları I                 | C   | 2  | 0 | 2  | 2  |        |
| MTH113             | Linear Algebra                                     | Lineer Cebir                                           | C   | 3  | 0 | 3  | 5  |        |
|                    |                                                    |                                                        |     |    |   |    |    |        |
| Total              |                                                    |                                                        |     | 18 | 4 | 20 | 30 |        |
|                    | 4th Semester                                       |                                                        |     |    |   |    |    |        |
| CODE               | COURSE NAME                                        | DERS ADI                                               | C/E | T  | P | C  | E  |        |
| AII202             | Database Management<br>Systems                     | Veri Tabanı Yönetim<br>Sistemleri                      | C   | 3  | 2 | 4  | 5  | AII201 |
| AII203             | Computer Architecture<br>and Organization          | Bilgisayar Mimarisi ve<br>Organizasyonu                | C   | 3  | 2 | 4  | 5  | AII001 |
| COM208             | Electronics I                                      | Elektronik I                                           | C   | 3  | 2 | 4  | 5  | AII204 |
| ENG201             | English Communication<br>Skills                    | İngilizce İletişim                                     | C   | 3  | 0 | 3  | 4  | ENG102 |
| AİT104 /<br>AİT102 | Atatürk Principles &<br>Reforms II                 | Atatürk Prensipleri ve<br>Reformları II                | C   | 2  | 0 | 2  | 2  | AİT103 |
| RE                 | Restricted Electives                               | Sınırlı Seçmeli                                        | E   | 3  | 0 | 3  | 4  |        |
| COM200             | Summer Training I                                  | Staj 1                                                 | C   | 0  | 0 | 0  | 5  |        |
| Total              |                                                    |                                                        |     | 17 | 6 | 20 | 30 |        |
|                    | 5th Semester                                       |                                                        |     |    |   |    |    |        |
| CODE               | COURSE NAME                                        | DERS ADI                                               | C/E | T  | P | C  | E  |        |
| AII302             | Operating Systems                                  | İşletim Sistemleri                                     | C   | 3  | 0 | 3  | 6  | AII203 |
| COM362             | Signals and Systems<br>for Computer<br>Engineers   | Bilgisayar Mühendisleri<br>için Sinyaller ve Sistemler | C   | 3  | 2 | 4  | 6  | MTH201 |
| COM339             | Programming                                        | Programlama Dilleri                                    | C   | 3  | 0 | 3  | 5  | AII106 |

|        |                                    |                             |     |    |   |    |    |        |
|--------|------------------------------------|-----------------------------|-----|----|---|----|----|--------|
|        | Language Concepts                  | Kavramı                     |     |    |   |    |    |        |
| MTH251 | Probability and Statistics         | Olasılık ve İstatistik      | C   | 3  | 0 | 3  | 6  | MTH102 |
| COM344 | Automata Theory                    | Otomata Teorisi             | C   | 3  | 0 | 3  | 5  | AII104 |
| CAR100 | Career Planning                    | Kariyer Planlama            | C   | 2  | 0 | 0  | 2  |        |
| Total  |                                    |                             |     | 17 | 2 | 16 | 30 |        |
|        | 6th Semester                       |                             |     |    |   |    |    |        |
| CODE   | COURSE NAME                        | DERS ADI                    | C/E | T  | P | C  | E  |        |
| AII351 | Embedded Systems                   | Gömülü Sistemler            | C   | 3  | 2 | 4  | 5  | AII203 |
| AII303 | Data Communications and Networking | Veri İletişimi ve Ağlar     | C   | 3  | 2 | 4  | 5  |        |
| COM333 | Operational Research               | Yöneylem Araştırması        | E   | 3  | 0 | 3  | 5  | AII201 |
| COM382 | Real Time Systems                  | Gerçek Zamanlı Sistemler    | E   | 3  | 0 | 3  | 5  | MTH201 |
| AII002 | Systems Simulation                 | Sistem Simülasyonu          | C   | 3  | 0 | 3  | 5  | MTH251 |
| COM300 | Summer Training II                 | Staj II                     | C   | 0  | 0 | 0  | 5  |        |
| Total  |                                    |                             |     | 15 | 4 | 17 | 30 |        |
|        | 7th Semester                       |                             |     |    |   |    |    |        |
| CODE   | COURSE NAME                        | DERS ADI                    | C/E | T  | P | C  | E  |        |
| COM490 | Engineering Design I               | Mühendislik Tasarımı I      | C   | 2  | 2 | 3  | 7  |        |
| AII003 | Software Engineering               | Yazılım Mühendisliği        | C   | 3  | 0 | 3  | 6  | COM339 |
| TE     | Technical Elective                 | Teknik Seçmeli              | E   | 3  | 0 | 3  | 5  |        |
| TE     | Technical Elective                 | Teknik Seçmeli              | E   | 3  | 0 | 3  | 5  |        |
| TE     | Technical Elective                 | Teknik Seçmeli              | E   | 3  | 0 | 3  | 5  |        |
| CHC100 | Cyprus: History and Culture        | Kıbrıs Kültürü ve Tarihi    | E   | 2  | 0 | 0  | 2  |        |
| Total  |                                    |                             |     | 16 | 2 | 15 | 30 |        |
|        | 8th Semester                       |                             |     |    |   |    |    |        |
| CODE   | COURSE NAME                        | DERS ADI                    | C/E | T  | P | C  | E  |        |
| COM491 | Engineering Design II              | Mühendislik Tasarımı II     | C   | 2  | 2 | 3  | 8  | COM490 |
| AII426 | Economics For Engineers            | Mühendisler için Ekonomi    | E   | 3  | 0 | 3  | 5  |        |
| FE     | Free Elective                      | Serbest Seçmeli             | E   | 3  | 0 | 3  | 5  |        |
| TE     | Technical Elective                 | Teknik Seçmeli              | E   | 3  | 0 | 3  | 5  |        |
| TE     | Technical Elective                 | Teknik Seçmeli              | E   | 3  | 0 | 3  | 5  |        |
| AII439 | Occupational Health and Safety     | Mühendisler İçin İş Sağlığı | E   | 2  | 0 | 2  | 2  |        |
| Total  |                                    |                             |     | 16 | 2 | 18 | 30 |        |

YIT101, YIT102, AIT103, AIT104 are designated for oversee students (foreigners). AIT101, AIT 102, TUR101, TUR102 are designated for the students of Turkish nationality.

MT: Mathematics, BS: Basic Science, ECS: English Composition and Social Sciences, CS: Computer Science, OCE: Obligatory Computer Engineering Courses, ECE: Elective Computer Engineering Courses, BT: Bachelor's Thesis, SI: Summer Internship.

#### 8.4. Types of Elective Courses

| Technical Electives |                                                 |                                               |   |   |   |   |
|---------------------|-------------------------------------------------|-----------------------------------------------|---|---|---|---|
| CODE                | COURSE NAME                                     | DERS ADI                                      | T | P | C | E |
| AII401              | Microprocessor Systems                          | Mikroişlemci Sistemleri                       | 3 | 0 | 3 | 5 |
| AII402              | Computer Graphics                               | Bilgisayar Grafikleri                         | 3 | 0 | 3 | 5 |
| COM410              | Parallel Computer Architecture                  | Paralel Bilgisayar Mimarisi                   | 3 | 0 | 3 | 5 |
| COM414              | Digital Control Systems                         | Dijital Kontrol Sistemleri                    | 3 | 0 | 3 | 5 |
| COM416              | Computer Networks                               | Bilgisayar Ağları                             | 3 | 0 | 3 | 5 |
| AII404              | Neural Networks                                 | Sinir Ağları                                  | 3 | 0 | 3 | 5 |
| AII405              | Computer Hardware                               | Bilgisayar Donanımı                           | 3 | 0 | 3 | 5 |
| AII406              | System Programming                              | Sistem Programlama                            | 3 | 0 | 3 | 5 |
| COM430              | Programming Languages I                         | Programlama Dilleri I                         | 3 | 0 | 3 | 5 |
| AII407              | Programming Languages II                        | Programlama Dilleri II                        | 3 | 0 | 3 | 5 |
| AII005              | Internet Programming                            | İnternet Programlama                          | 3 | 0 | 3 | 5 |
| AII408              | Advanced Object Oriented Programming            | Gelişmiş Nesne Yönelimli Programlama          | 3 | 0 | 3 | 5 |
| AII409              | Object Oriented Programming II                  | Nesne Yönelimli Programlama II                | 3 | 0 | 3 | 5 |
| COM447              | Advanced Operating System                       | Gelişmiş İşletim Sistemi                      | 3 | 0 | 3 | 5 |
| AII411              | Digital Signal Processing                       | Dijital Sinyal İşleme                         | 3 | 0 | 3 | 5 |
| AII412              | Database Applications                           | Veritabanı Uygulamaları                       | 3 | 0 | 3 | 5 |
| AII413              | Introduction to Artificial Intelligence         | Yapay Zeka'ya Giriş                           | 3 | 0 | 3 | 5 |
| COM452              | Introduction to Parallel Computing              | Paralel Hesaplamaya Giriş                     | 3 | 0 | 3 | 5 |
| AII415              | Decision Making                                 | Karar Verme                                   | 3 | 0 | 3 | 5 |
| COM454              | Advanced Computer Architecture and Organization | Gelişmiş Bilgisayar Mimarisi ve Organizasyonu | 3 | 0 | 3 | 5 |
| AII417              | Mobile Computing                                | Mobil Hesaplama                               | 3 | 0 | 3 | 5 |
| AII419              | Digital Image Processing                        | Dijital Görüntü İşleme                        | 3 | 0 | 3 | 5 |
| COM471              | Hardware Design using FPGAs                     | FPGA'ları Kullanarak Donanım Tasarımı         | 3 | 0 | 3 | 5 |

|        |                                  |                             |   |   |   |   |
|--------|----------------------------------|-----------------------------|---|---|---|---|
| AII006 | Web Design and Programming       | Web Tasarımı ve Programlama | 3 | 0 | 3 | 5 |
| AII007 | Multimedia Systems               | Multimedya Sistemleri       | 3 | 0 | 3 | 5 |
| AII435 | Mechatronics                     | Mekatronik                  | 3 | 0 | 3 | 5 |
| AII423 | Robotic Systems                  | Robotik Sistemler           | 3 | 0 | 3 | 5 |
| AII445 | Introduction to Machine Learning | Makine Öğrenmesine Giriş    | 3 | 0 | 3 | 5 |
| AII439 | Occupational Safety (Elective)   | İş Sağlığı ve Güvenliği     | 2 | 0 | 3 | 3 |

| Restricted Electives |                    |                |   |   |   |   |
|----------------------|--------------------|----------------|---|---|---|---|
| CODE                 | COURSE NAME        | DERS ADI       | T | P | C | E |
| MTH323               | Numerical Analysis | Sayısal Analiz | 3 | 0 | 3 | 4 |
| COM315               | Algorithms         | Algoritmalar   | 3 | 0 | 3 | 4 |
| AII217               | Microbiology       | Mikrobiyoloji  | 3 | 0 | 3 | 4 |
| BME102               | Biochemistry       | Biyokimya      | 3 | 0 | 3 | 4 |

| Free Electives |                            |                                |   |   |   |   |
|----------------|----------------------------|--------------------------------|---|---|---|---|
| CODE           | COURSE NAME                | DERS ADI                       | T | P | C | E |
| AII427         | Management for Engineers   | Mühendisler için Yönetim       | 3 | 0 | 3 | 5 |
| BME102         | One of Technical Electives | Teknik Seçmeli Derslerden Biri | 3 | 0 | 3 | 5 |

#### Additional Notes

A total of 240 ECTS credits of courses are required to graduate. The Computer Engineering students must complete technical and non-technical elective courses to provide a total of 240 ECTS credits. Otherwise they will not be deemed to fulfill the conditions to graduate from the program.

#### **Elective Courses**

The students of Computer Engineering department must take 5 technical elective courses to graduate.

These courses must be selected from the Technical Elective Courses list. Courses that are not in this list cannot be accepted as technical electives.

ECTS credits of elective courses should be equal or greater than the credits specified in the curriculum.

#### Important Information about the Non-technical Electives

The students of Computer Engineering department must take 1 free elective courses to graduate. These can be selected from the General Elective Courses (courses with GEC codes) or General Common Elective (courses with GCE codes), which are offered by the Common Courses Coordination Unit (odk.neu.edu.tr) or from technical elective courses. The list of these courses are updated every semester.

ECTS credits of GEC/GCE courses should be equal or greater than the credits specified in the curriculum.

\* The Computer Engineering students must ensure that while selecting a new technical, GEC or GCE elective course, it should not be the same, similar or less comprehensive as any course you have previously taken in your curriculum or any compulsory course in your curriculum that you have not taken yet. In this case, the courses you have taken will not be counted as any elective courses and will not fulfill any qualifications in the curriculum.

If you need support for these courses due to your disability, please refer to Disability Support Unit.  
Contact; [engelsiz@neu.edu.tr](mailto:engelsiz@neu.edu.tr)

### **8.5.Course Syllabus**

Information regarding the syllabi of all courses included in the program is provided below. It includes the content, objectives, learning outcomes, instructional plan, assessment methods, and other important information related to the course.

| NEAR EAST UNIVERSITY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------|----------------------|---------|---------------------------|------|------|------------|------|---------------------|--|
| COMPUTER ENGINEERING                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |
| COURSE SYLLABUS                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |
| Course Code: AII001                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Course Name: Logic Design                                                                                                  |             |                      |         | Course Status: Compulsory |      |      | Credits: 4 |      | ECTS: 6             |  |
| Course Language: English                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Type of Course: Face-to-face                                                                                               |             | Prerequisite: AII104 |         | Year: 2                   |      |      | Term: Fall |      | Continuation : % 70 |  |
| Weekly Class Hours                                                        | Class time                                                                                                                                                                                                                                                                                                                                                                                                                                             | Laboratory                                                                                                                 | Application | Learning Sessions    |         |                           |      |      |            |      |                     |  |
|                                                                           | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 2                                                                                                                          |             | *PS                  |         | *KR                       |      | *R   |            | *I   |                     |  |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                            |             | 1                    |         | 1                         |      | 1    |            | 1    |                     |  |
| Learning Outcomes of the Course                                           | Upon completing this course, students will                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | LO1                                                                                                                                                                                                                                                                                                                                                                                                                                                    | be able to use various number systems and performs the conversion between them.                                            |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | LO2                                                                                                                                                                                                                                                                                                                                                                                                                                                    | be able to use the minimization methods to minimize the cost of realizing a logic function with physical circuit elements. |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | LO3                                                                                                                                                                                                                                                                                                                                                                                                                                                    | be able to analyse and design combinational logic circuits.                                                                |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | LO4                                                                                                                                                                                                                                                                                                                                                                                                                                                    | be able to analyse and design synchronous and asynchronous sequential logic circuits.                                      |             |                      |         |                           |      |      |            |      |                     |  |
| The Relationship Between Learning Outcomes and Program Competencies       |                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PR** 1                                                                                                                     | PR 2        | PR 3                 | PR 4    | PR 5                      | PR 6 | PR 7 | PR 8       | PR 9 | PR 10               |  |
|                                                                           | LO1                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                                                                                                                          | 3           | 3                    | 3       | 3                         | 3    | 3    | 1          | 1    | 1                   |  |
|                                                                           | LO2                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                                                                                                                          | 3           | 5                    | 5       | 3                         | 5    | 5    | 1          | 1    | 1                   |  |
|                                                                           | LO3                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                                                                                                                          | 5           | 5                    | 5       | 5                         | 5    | 5    | 5          | 2    | 5                   |  |
|                                                                           | LO4                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 5                                                                                                                          | 5           | 5                    | 5       | 5                         | 5    | 5    | 5          | 2    | 5                   |  |
|                                                                           | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1: None                                                                                                                    | 2: Weak     | 3: Middle            | 4: Good | 5: Very good              |      |      |            |      |                     |  |
| Course Description                                                        | Introduction to number systems and codes. Boolean algebra and logic gates. Simplification of switching functions. Combinational logic. Combinational circuit design with programmable devices. Introduction to sequential devices. Modular sequential logic. Analysis and synthesis of synchronous sequential circuits. Sequential circuits with programmable logic devices. Introduction to microprocessors programming.                              |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |
| Course Objectives                                                         | To provide the ability to analyse and design combinational digital logic circuits. To provide the ability to analyse and design sequential digital logic circuits. To provide the ability to analyse and design modular, hierarchical digital systems.                                                                                                                                                                                                 |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |
| Textbook / Resources                                                      | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                      | V.P. Nelson, H.T. Nagle, B.D. Carroll, D. Irwin. Digital Logic Circuit Analysis and Design. Pearson. 2/e. 2021.            |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Hüseyin Ekiz. Mantık Devreleri Sayısal Elektronik. Değişim Yayıncılık. 2008.                                               |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                      | M. Morris Mano. Sayısal Tasarım 2. Basım'dan Çeviri. Literatür Yayıncılık. 2002.                                           |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                      | M.M.R. Mano, M.D. Ciletti, Digital Design, Global Edition, 6th Edition, Pearson, 2019.                                     |             |                      |         |                           |      |      |            |      |                     |  |
|                                                                           | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                      | www and artificial intelligence tools (ChatGPT, Gemini & DeepSeek)                                                         |             |                      |         |                           |      |      |            |      |                     |  |
| Teaching Methods of the Course                                            | Problem Solving Method, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |
| Course Content                                                            | Fundamental concepts of digital electronics. Number systems and codes related to digital logic circuits. Logic gates and their operations. Boolean algebra, Karnaugh maps, and simplification of digital logic circuits. Combinational logic circuits. Decoders/encoders and de/multiplexers. Flip-Flops and latches. Parity circuits and arithmetic logic. Sequential logic circuits, design of synchronous counters, registers, and register arrays. |                                                                                                                            |             |                      |         |                           |      |      |            |      |                     |  |

|                                                                                                                                        |                                                                                                                                                                                                                                                       |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--|--------------------------|--|------------------|--|----------------------------------------------|--------|--------------------------|--|----------------------|--|
| Topics to be Covered Each Week                                                                                                         | Week                                                                                                                                                                                                                                                  | Subject                                                    |  |                          |  | Activities       |  |                                              | Source |                          |  |                      |  |
|                                                                                                                                        | 1                                                                                                                                                                                                                                                     | Introduction to digital systems, Number systems and codes. |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 2                                                                                                                                                                                                                                                     | Number systems and codes.                                  |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 3                                                                                                                                                                                                                                                     | Logic gates and circuits.                                  |  |                          |  | PS,KR,R,I        |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 4                                                                                                                                                                                                                                                     | Design and analysis of combinational circuits.             |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 5                                                                                                                                                                                                                                                     | Design and analysis of combinational circuits.             |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 6                                                                                                                                                                                                                                                     | Design and analysis of combinational circuits.             |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 7                                                                                                                                                                                                                                                     | Design and analysis of combinational circuits.             |  |                          |  | PS,KR,R,I        |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 8                                                                                                                                                                                                                                                     | Midterm exam                                               |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
|                                                                                                                                        | 9                                                                                                                                                                                                                                                     | Introduction to Sequential Circuits.                       |  |                          |  | PS,KR,R,I        |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 10                                                                                                                                                                                                                                                    | Synchronous sequential circuit analysis.                   |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 11                                                                                                                                                                                                                                                    | Synchronous sequential circuit design.                     |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 12                                                                                                                                                                                                                                                    | Synchronous sequential circuit design.                     |  |                          |  | PS,KR,R,I        |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 13                                                                                                                                                                                                                                                    | Asynchronous sequential circuit analysis.                  |  |                          |  | PS,KR,I          |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 14                                                                                                                                                                                                                                                    | Asynchronous sequential circuit design.                    |  |                          |  | PS,KR,R,I        |  |                                              | 1,-,5  |                          |  |                      |  |
|                                                                                                                                        | 15                                                                                                                                                                                                                                                    | Review of the Semester.                                    |  |                          |  | PS,KR,R,I        |  |                                              | 1,-,5  |                          |  |                      |  |
| 16                                                                                                                                     | Final exam                                                                                                                                                                                                                                            |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
| Evaluation Criteria                                                                                                                    | Method                                                                                                                                                                                                                                                |                                                            |  | Contribution %           |  | Source           |  | Relevant Qualifications                      |        |                          |  |                      |  |
|                                                                                                                                        | 1                                                                                                                                                                                                                                                     | Midterm exam                                               |  | 30                       |  | 1,-,5            |  | PR1,PR2,PR3,PR4,PR6,PR7                      |        |                          |  |                      |  |
|                                                                                                                                        | 2                                                                                                                                                                                                                                                     | Laboratory                                                 |  | 10                       |  | 1,-,5            |  | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10     |        |                          |  |                      |  |
|                                                                                                                                        | 3                                                                                                                                                                                                                                                     | Final exam                                                 |  | 60                       |  | 1,-,5            |  | PR1,PR2,PR3,PR4,PR6,PR7                      |        |                          |  |                      |  |
| Limitations on the Use of Artificial Intelligence                                                                                      | * The use of AI tools should not conflict with the existing principles and policies of Near East University.                                                                                                                                          |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
|                                                                                                                                        | * AI tool responses can be biased, inaccurate or misleading and is further limited by their last software update. Students should not let AI tools generate facts also skip critical thinking by accepting AI generated answers without verification. |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
|                                                                                                                                        | * Transparency is essential in the use of AI tools. Students should specified where, why, and how they used AI tools in the bibliography and acknowledgements sections.                                                                               |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
|                                                                                                                                        | * The lab reports will be checked by the instructor for AI generated content using Turnitin AI Detection. AI generated content must not exceed 10% of the total word count of the reports.                                                            |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
|                                                                                                                                        | * It is each student's responsibility to follow the guidelines and ensure their work meets academic integrity standards. Inappropriate use of the AI tools will be considered academic misconduct, resulting in a zero grade.                         |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
| Learning Program                                                                                                                       |                                                                                                                                                                                                                                                       |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
| Educational Tool                                                                                                                       |                                                                                                                                                                                                                                                       | Quantity                                                   |  | Student Workload (Hours) |  | Educational Tool |  | Quantity                                     |        | Student Workload (Hours) |  |                      |  |
| Course duration in class                                                                                                               |                                                                                                                                                                                                                                                       | 14                                                         |  | 4      56                |  | Midterm exam     |  | 1                                            |        | 21      21               |  |                      |  |
| Self-Study                                                                                                                             |                                                                                                                                                                                                                                                       | 14                                                         |  | 4      56                |  | Final exam       |  | 1                                            |        | 37      37               |  |                      |  |
| Laboratory                                                                                                                             |                                                                                                                                                                                                                                                       | 10                                                         |  | 1      10                |  |                  |  |                                              |        |                          |  |                      |  |
| Total Workload                                                                                                                         |                                                                                                                                                                                                                                                       |                                                            |  | 180                      |  |                  |  | Estimated ECTS Credit (Total Workload/ 30) : |        | 6                        |  | Approximately      6 |  |
| * For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |                                                                                                                                                                                                                                                       |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |
| ** Program Requirements                                                                                                                |                                                                                                                                                                                                                                                       |                                                            |  |                          |  |                  |  |                                              |        |                          |  |                      |  |

| NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS FACULTY |                                                                     |                                                                                                                                                                 |             |                    |                              |         |           |        |        |                   |      |
|------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------------|------------------------------|---------|-----------|--------|--------|-------------------|------|
| COMPUTER ENGINEERING DEPARTMENT                                        |                                                                     |                                                                                                                                                                 |             |                    |                              |         |           |        |        |                   |      |
| COURSE SYLLABUS                                                        |                                                                     |                                                                                                                                                                 |             |                    |                              |         |           |        |        |                   |      |
| Course Code: AII002                                                    | Course Name:SYSTEM SIMULATION                                       |                                                                                                                                                                 |             |                    | Course Status:<br>COMPULSORY |         | Credits:3 |        | ECTS:6 |                   |      |
| Course Language: ENGLISH                                               | Type of Course:FACE TO FACE                                         |                                                                                                                                                                 |             | Prerequisite: NONE |                              | Year: 3 |           | Term:5 |        | Continuation: %70 |      |
| Weekly Class Hours                                                     | Class time                                                          | Laboratory                                                                                                                                                      | Application | Learning Sessions  |                              |         |           |        |        |                   |      |
|                                                                        | 3                                                                   | 0                                                                                                                                                               | .0          | *PS                |                              | *KR     |           | *R     |        | *I                |      |
|                                                                        |                                                                     |                                                                                                                                                                 |             | 3                  |                              | 3       |           | 0      |        | 0                 |      |
| Learning Outcomes of the Course                                        | Upon completing this course, students will                          |                                                                                                                                                                 |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO1                                                                | Ability to understand and apply knowledge of mathematics, science, and engineering                                                                              |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO2                                                                | An ability to analyze a problem, identify and define the computing requirements appropriate to its solution                                                     |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO3                                                                | An ability to apply mathematical foundations, algorithmic principles, and computer engineering techniques in the modelling and design of computer-based systems |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO4                                                                | An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social aspects         |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO5                                                                | Planning and carrying out experiments, as well as to analyze and interpret data                                                                                 |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO6                                                                | Ability to use the techniques, skills and modern engineering tools necessary for engineering practice                                                           |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO7                                                                | An understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering                                     |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO8                                                                | An ability to work productively in a multidisciplinary team, in particular to carry out projects involving computer engineering skills                          |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►LO9                                                                | An ability to communicate effectively with a range of audiences                                                                                                 |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | ►L10                                                                | A recognition of the need for, and an ability to engage in life-long learning                                                                                   |             |                    |                              |         |           |        |        |                   |      |
|                                                                        | The Relationship Between Learning Outcomes and Program Competencies |                                                                                                                                                                 | PR** 1      | PR 2               | PR 3                         | PR 4    | PR 5      | PR 6   | PR 7   | PR 8              | PR 9 |

|                      |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                              |         |   |         |   |           |         |   |              |
|----------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------|---|---------|---|-----------|---------|---|--------------|
|                      | LO1                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                                                            | 1       | 1 | 2       | 2 | 1         | 1       | 2 | 3            |
|                      | LO 2               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                                                            | 1       | 1 | 3       | 2 | 2         | 1       | 1 | 2            |
|                      | LO 3               | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                                                            | 1       | 1 | 1       | 1 | 1         | 1       | 2 | 1            |
|                      | LO 4               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4                                                            | 2       | 2 | 2       | 2 | 1         | 3       | 3 | 2            |
|                      | LO 5               | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                                                            | 2       | 2 | 2       | 1 | 1         | 4       | 2 | 2            |
|                      | LO 6               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3                                                            | 3       | 2 | 4       | 4 | 1         | 1       | 2 | 2            |
|                      | LO7                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                                                            | 1       | 3 | 3       | 1 | 2         | 2       | 2 | 1            |
|                      | LO8                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                                                            | 1       | 1 | 3       | 3 | 2         | 1       | 1 | 3            |
|                      | LO9                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 4                                                            | 2       | 2 | 2       | 2 | 1         | 3       | 3 | 2            |
|                      | L10                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                                                            | 2       | 2 | 2       | 1 | 1         | 4       | 2 | 2            |
|                      | Contribution Level |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                              | 1: NONE |   | 2: Weak |   | 3: MIDDLE | 4: GOOD |   | 5: VERY GOOD |
| Course Description   |                    | Study system simulation operarions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                              |         |   |         |   |           |         |   |              |
| Course Objectives    |                    | To explain/describe the identified concept(s).<br>To raise and develop awareness related to the relevant concept(s).<br>To discuss the validity of the identified concept(s).<br>To develop the selected/determined skills.<br>To examine the selected topics in depth/in detail.<br>To enhance students’ existing knowledge regarding the identified concepts/theories/topics.<br>To develop students’ ideas/knowledge/understanding within the context of the selected concepts.<br>To refresh students’ existing knowledge regarding the identified concepts/theories/topics.<br>To encourage innovation.<br>To develop critical thinking<br>By examining other approaches, to ensure that students gain knowledge about educational policies, structures, and practices on a global scale. |                                                              |         |   |         |   |           |         |   |              |
| Textbook / Resources |                    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Discrete-Event System Simulation. By: J. Banks and B. Nelson |         |   |         |   |           |         |   |              |
|                      |                    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Simulation Modeling and Analysis. By: A. Law and W. Kelton   |         |   |         |   |           |         |   |              |
|                      |                    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                              |         |   |         |   |           |         |   |              |

|                                |                                                                                                                                                                                                                                                                                                           |                                             |                |        |                                          |        |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------|--------|------------------------------------------|--------|
|                                | 4                                                                                                                                                                                                                                                                                                         |                                             |                |        |                                          |        |
|                                | 5                                                                                                                                                                                                                                                                                                         |                                             |                |        |                                          |        |
| Teaching Methods of the Course | Lectures, Problem Solving,Projects, Question-Answer                                                                                                                                                                                                                                                       |                                             |                |        |                                          |        |
| Course Content                 | Introduction to simulation as a problem solving tool . Methodology of simulation . The use of computers. Classification of simulation . (Monte Carlo Techniques. Markov Models. Basics of queueing theory. Planing of a computer simulation experiment. Introduction to simulation programming languages. |                                             |                |        |                                          |        |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                      | Subject                                     |                |        | Activities                               | Source |
|                                | 1                                                                                                                                                                                                                                                                                                         | Introduction to Simulation                  |                |        | KR                                       | 1&2    |
|                                | 2                                                                                                                                                                                                                                                                                                         | Discrete-Event System Simulation            |                |        | KR                                       | 1&2    |
|                                | 3                                                                                                                                                                                                                                                                                                         | Simulation of Queueing Systems              |                |        | KR                                       | 1&2    |
|                                | 4                                                                                                                                                                                                                                                                                                         | Simulation of Inventory Systems             |                |        | KR, PS                                   | 1&2    |
|                                | 5                                                                                                                                                                                                                                                                                                         | Manual Simulation Using Event Scheduling    |                |        | KR, PS                                   | 1&2    |
|                                | 6                                                                                                                                                                                                                                                                                                         | Random Number Generation                    |                |        | KR, PS                                   | 1&2    |
|                                | 7                                                                                                                                                                                                                                                                                                         | Examination (Mid term)                      |                |        | KR, PS                                   | 1&2    |
|                                | 8                                                                                                                                                                                                                                                                                                         | Statistical Models                          |                |        | KR                                       | 1&2    |
|                                | 9                                                                                                                                                                                                                                                                                                         | The Event Scheduling/Time Advance Algorithm |                |        | KR                                       | 1&2    |
|                                | 10                                                                                                                                                                                                                                                                                                        | Project Assignments and discussion          |                |        | PS                                       | 1&2    |
|                                | 11                                                                                                                                                                                                                                                                                                        | Introductiön to Simulation Software         |                |        | PS                                       | 1&2    |
|                                | 12                                                                                                                                                                                                                                                                                                        | Simulation Software applications            |                |        | KR, PS                                   | 1&2    |
|                                | 13                                                                                                                                                                                                                                                                                                        | Prroject presentation and Q&A               |                |        | KR, PS                                   | 1&2    |
|                                | 14                                                                                                                                                                                                                                                                                                        | Examination (Final)                         |                |        | PS                                       | 1&2    |
| Evaluation Criteria            | Method                                                                                                                                                                                                                                                                                                    |                                             | Contribution % | Source | Relevant Qualifications                  |        |
|                                | 1                                                                                                                                                                                                                                                                                                         | Midterm Exam                                | 35             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |        |
|                                | 2                                                                                                                                                                                                                                                                                                         | Final Exam                                  | 50             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |        |
|                                | 3                                                                                                                                                                                                                                                                                                         | Term projext                                | 15             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |        |
|                                | 4                                                                                                                                                                                                                                                                                                         |                                             |                |        |                                          |        |

|                                                                                                                                      |          |                          |    |                                                      |                                              |                          |          |               |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|------------------------------------------------------|----------------------------------------------|--------------------------|----------|---------------|-----|
|                                                                                                                                      | 5        |                          |    |                                                      |                                              |                          |          |               |     |
|                                                                                                                                      | 6        |                          |    |                                                      |                                              |                          |          |               |     |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        |                          |    |                                                      |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                          |    |                                                      |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                          |    |                                                      |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                          |    |                                                      |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                          |    |                                                      |                                              |                          |          |               |     |
| Learning Program                                                                                                                     |          |                          |    |                                                      |                                              |                          |          |               |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                                     | Quantity                                     | Student Workload (Hours) |          |               |     |
| Course Hours                                                                                                                         | 14       | 14x3                     | 42 | Knowledge Reinforcement and Problem Solving Sessions | 7                                            | 4x7                      | 28       |               |     |
| Preparation for the Course:                                                                                                          | 14       | 14x3                     | 42 |                                                      |                                              |                          |          |               |     |
| Research Project 1                                                                                                                   | 1        | 1x4                      | 4  |                                                      |                                              |                          |          |               |     |
| Research Project 2                                                                                                                   |          |                          |    |                                                      |                                              |                          |          |               |     |
| Research Project 3                                                                                                                   |          |                          |    |                                                      |                                              |                          |          |               |     |
| In-Class Discussion/Practice                                                                                                         | 2        | 2x6                      | 12 |                                                      |                                              |                          |          |               |     |
| Preparation for Activities                                                                                                           | 2        | 2x24                     | 48 |                                                      |                                              |                          |          |               |     |
| Total Workload                                                                                                                       |          | 176                      |    |                                                      | Estimated ECTS Credit (Total Workload/ 30) : |                          | 5.866667 | Approximately | 5.9 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                                      |                                              |                          |          |               |     |

\*\* Program Requirements

| NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS FACULTY |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|---------|-----------|--------|--------|-------------------|------|-------|
| COMPUTER ENGINEERING DEPARTMENT                                        |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
| COURSE SYLLABUS                                                        |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
| Course Code: AII004                                                    | Course Name:PROGRAMMING LANGUAGES I        |                                                                                                                                                                 |                    | Course Status:<br>COMPULSORY |         | Credits:3 |        | ECTS:6 |                   |      |       |
| Course Language:<br>ENGLISH                                            | Type of Course:FACE TO FACE                |                                                                                                                                                                 | Prerequisite: NONE |                              | Year: 3 |           | Term:5 |        | Continuation: %70 |      |       |
| Weekly Class Hours                                                     | Class time                                 | Laboratory                                                                                                                                                      | Application        | Learning Sessions            |         |           |        |        |                   |      |       |
|                                                                        | 2                                          | 1                                                                                                                                                               | 0                  | *PS                          | *KR     |           | *R     |        | *I                |      |       |
|                                                                        |                                            |                                                                                                                                                                 |                    | 3                            | 3       |           | 0      |        | 0                 |      |       |
| Learning Outcomes of the Course                                        | Upon completing this course, students will |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO1                                      | Ability to understand and apply knowledge of mathematics, science, and engineering                                                                              |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO2                                      | An ability to analyze a problem, identify and define the computing requirements appropriate to its solution                                                     |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO3                                      | An ability to apply mathematical foundations, algorithmic principles, and computer engineering techniques in the modelling and design of computer-based systems |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO4                                      | An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social aspects         |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO5                                      | Planning and carrying out experiments, as well as to analyze and interpret data                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO6                                      | Ability to use the techniques, skills and modern engineering tools necessary for engineering practice                                                           |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO7                                      | An understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering                                     |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO8                                      | An ability to work productively in a multidisciplinary team, in particular to carry out projects involving computer engineering skills                          |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► LO9                                      | An ability to communicate effectively with a range of audiences                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ► L10                                      | A recognition of the need for, and an ability to engage in life-long learning                                                                                   |                    |                              |         |           |        |        |                   |      |       |
| The Relationship Between Learning Outcomes and Program                 |                                            | PR** 1                                                                                                                                                          | PR 2               | PR 3                         | PR 4    | PR 5      | PR 6   | PR 7   | PR 8              | PR 9 | PR 10 |
|                                                                        | LO1                                        | 2                                                                                                                                                               | 2                  | 1                            | 1       | 2         | 2      | 1      | 1                 | 2    | 3     |



|                                |                                                     |                                                    |                |        |                                          |        |
|--------------------------------|-----------------------------------------------------|----------------------------------------------------|----------------|--------|------------------------------------------|--------|
|                                | 5                                                   |                                                    |                |        |                                          |        |
| Teaching Methods of the Course | Lectures, Problem Solving, Labwork, Question-Answer |                                                    |                |        |                                          |        |
| Course Content                 | Visual basic.net programming                        |                                                    |                |        |                                          |        |
| Topics to be Covered Each Week | Week                                                | Subject                                            |                |        | Activities                               | Source |
|                                | 1                                                   | Introduction to Integrated Development Environment |                |        | KR                                       | 1&2    |
|                                | 2                                                   | Forms and Menues                                   |                |        | KR                                       | 1&2    |
|                                | 3                                                   | Controls and their properties                      |                |        | KR                                       | 1&2    |
|                                | 4                                                   | Variables                                          |                |        | KR, PS                                   | 1&2    |
|                                | 5                                                   | Events                                             |                |        | KR, PS                                   | 1&2    |
|                                | 6                                                   | Arithmetical and logical Operators                 |                |        | KR, PS                                   | 1&2    |
|                                | 7                                                   | Decision Making                                    |                |        | KR, PS                                   | 1&2    |
|                                | 8                                                   | Project evaluation                                 |                |        | KR                                       | 1&2    |
|                                | 9                                                   | Loops                                              |                |        | KR, PS                                   | 1&2    |
|                                | 10                                                  | Bult in functions                                  |                |        | PS                                       | 1&2    |
|                                | 11                                                  | Subroutine and functions                           |                |        | PS                                       | 1&2    |
|                                | 12                                                  | Error management and debugging                     |                |        | PS                                       | 1&2    |
|                                | 13                                                  | Database connection                                |                |        | PS                                       | 1&2    |
|                                | 14                                                  | Examination (Final)                                |                |        | PS                                       | 1&2    |
| Evaluation Criteria            | Method                                              |                                                    | Contribution % | Source | Relevant Qualifications                  |        |
|                                | 1                                                   | Project                                            | 40             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |        |
|                                | 2                                                   | Final Exam                                         | 50             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |        |
|                                | 3                                                   | Labwork                                            | 10             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |        |
|                                | 4                                                   |                                                    |                |        |                                          |        |
|                                | 5                                                   |                                                    |                |        |                                          |        |
|                                | 6                                                   |                                                    |                |        |                                          |        |

|                                                                                                                                      |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|------------------------------------------------------|----------|--------------------------|---------------|--|--|--|--|-----|
| Limitations on the Use of Artificial Intelligence                                                                                    | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Learning Program                                                                                                                     |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                                     | Quantity | Student Workload (Hours) |               |  |  |  |  |     |
| Course Hours                                                                                                                         | 14       | 14x3                     | 42 | Knowledge Reinforcement and Problem Solving Sessions | 7        | 4x7                      | 28            |  |  |  |  |     |
| Preparation for the Course:                                                                                                          | 14       | 14x3                     | 42 |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 1                                                                                                                   | 1        | 1x4                      | 4  |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 2                                                                                                                   |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 3                                                                                                                   |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| In-Class Discussion/Practice                                                                                                         | 2        | 2x6                      | 12 |                                                      |          |                          |               |  |  |  |  |     |
| Preparation for Activities                                                                                                           | 2        | 2x24                     | 48 |                                                      |          |                          |               |  |  |  |  |     |
| Total Workload                                                                                                                       |          | 176                      |    | Estimated ECTS Credit (Total Workload/ 30) :         |          | 5.866667                 | Approximately |  |  |  |  | 5.9 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                                        |                                                                                                                        |             |                   |                                      |         |            |              |         |      |                      |
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| DEPARTMENT OF COMPUTER ENGINEERING                                       |                                                        |                                                                                                                        |             |                   |                                      |         |            |              |         |      |                      |
| COURSE SYLLABUS                                                          |                                                        |                                                                                                                        |             |                   |                                      |         |            |              |         |      |                      |
| Course Code:<br>AII005                                                   | Course Name: Internet Programming                      |                                                                                                                        |             |                   | Course Status:<br>Technical Elective |         | Credits: 3 |              | ECTS: 5 |      |                      |
| Course Language:<br>English                                              | Type of Course: Online                                 |                                                                                                                        |             | Prerequisite: No  |                                      | Year: 4 |            | Term: Spring |         |      | Continuation:<br>70% |
| Weekly Class Hours                                                       | Class time                                             | Laboratory                                                                                                             | Application | Learning Sessions |                                      |         |            |              |         |      |                      |
|                                                                          | 2                                                      | 0                                                                                                                      | 1           | *PS               | *KR                                  | *R      |            |              | *I      |      |                      |
|                                                                          |                                                        |                                                                                                                        |             | 1                 | 1                                    | 1       |            |              | 1       |      |                      |
| Learning Outcomes of the Course                                          | Upon completing this course, students will be able to: |                                                                                                                        |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 1                                                  | Understand the structure of web pages and create well-organized, semantic layouts.                                     |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 2                                                  | Apply styling and design principles to develop responsive and visually effective user interfaces.                      |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 3                                                  | Build dynamic server-side components to process input, manage sessions, and generate adaptable content.                |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 4                                                  | Implement form handling and validation to ensure accurate and secure data submission.                                  |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 5                                                  | Integrate server-side applications with databases to perform data retrieval, insertion, updating, and deletion.        |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 6                                                  | Design and manage relational data structures, including the creation of tables, relationships, and queries.            |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 7                                                  | Combine front-end and back-end processes to develop functional, data-driven web applications.                          |             |                   |                                      |         |            |              |         |      |                      |
|                                                                          | ►LO 8                                                  | Test, evaluate, and deploy web applications while ensuring usability, reliability, and compatibility across platforms. |             |                   |                                      |         |            |              |         |      |                      |
| The Relationship Between Learning Outcomes and Program Competencies      |                                                        | PR** 1                                                                                                                 | PR 2        | PR 3              | PR 4                                 | PR 5    | PR 6       | PR 7         | PR 8    | PR 9 | PR 10                |
|                                                                          | LO1                                                    | 2                                                                                                                      | 3           | 2                 | 4                                    | 1       | 4          | 3            | 2       | 4    | 2                    |
|                                                                          | LO 2                                                   | 2                                                                                                                      | 3           | 2                 | 5                                    | 1       | 5          | 3            | 2       | 4    | 2                    |
|                                                                          | LO 3                                                   | 3                                                                                                                      | 4           | 4                 | 4                                    | 1       | 5          | 3            | 3       | 3    | 3                    |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                           |   |         |   |         |                                                                                               |         |   |   |              |  |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---|---------|---|---------|-----------------------------------------------------------------------------------------------|---------|---|---|--------------|--|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3                                                         | 4 | 3       | 4 | 1       | 5                                                                                             | 5       | 3 | 3 | 3            |  |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3                                                         | 5 | 5       | 4 | 2       | 5                                                                                             | 3       | 3 | 3 | 3            |  |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3                                                         | 4 | 5       | 4 | 3       | 4                                                                                             | 2       | 2 | 2 | 3            |  |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3                                                         | 5 | 5       | 5 | 2       | 5                                                                                             | 3       | 4 | 4 | 4            |  |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3                                                         | 4 | 3       | 5 | 4       | 5                                                                                             | 3       | 3 | 4 | 4            |  |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                           |   | 1: NONE |   | 2: Weak | 3: MIDDLE                                                                                     | 4: GOOD |   |   | 5: VERY GOOD |  |
| Course Description             | This course introduces the fundamental concepts and techniques of internet-based application development. Students learn how to design and construct structured web pages, apply styling principles for visually effective interfaces, and develop dynamic web applications through server-side programming. The course also provides essential knowledge of data-driven web development, including database design, query creation, and integration of web applications with data sources. Emphasis is placed on combining front-end and back-end components to create functional, interactive, and user-centered applications. By the end of the course, students will be able to build, test, and deploy complete web applications while considering usability, reliability, and best development practices. |                                                           |   |         |   |         |                                                                                               |         |   |   |              |  |
| Course Objectives              | The objective of this course is to equip students with the knowledge and skills necessary to design, develop, and deploy dynamic, data-driven web applications. Students will gain competencies in creating structured web interfaces, implementing server-side logic, managing user interaction and data flow, and integrating web applications with relational databases. The course aims to develop students’ ability to combine front-end and back-end technologies to produce functional, reliable, and user-focused web solutions.                                                                                                                                                                                                                                                                        |                                                           |   |         |   |         |                                                                                               |         |   |   |              |  |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | HTML & CSS: Design and Build Websites by Jon Duckett      |   |         |   |         |                                                                                               |         |   |   |              |  |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Beginning Active Server Pages 3.0 by David Buser et al.   |   |         |   |         |                                                                                               |         |   |   |              |  |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Access 2019 Bible by Michael Alexander & Richard Kusleika |   |         |   |         |                                                                                               |         |   |   |              |  |
| Teaching Methods of the Course | Lecture Method, Discussion Method, and Question-Answer Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                           |   |         |   |         |                                                                                               |         |   |   |              |  |
| Course Content                 | This course covers the fundamentals of web development, including creating structured and semantic web pages using HTML, applying styling and responsive design principles with CSS, and developing dynamic server-side applications using ASP with VBScript. Students will learn to handle user input, perform server-side validation, manage sessions, and integrate web applications with relational databases using Microsoft Access. The course also emphasizes combining front-end and back-end components to build functional, data-driven web applications, along with debugging, testing, and deploying websites. Practical exercises and projects throughout the course enable students to apply these skills to develop complete, interactive, and reliable web applications.                        |                                                           |   |         |   |         |                                                                                               |         |   |   |              |  |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Subject                                                   |   |         |   |         | Activities                                                                                    |         |   |   | Source       |  |
|                                | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Introduction to Internet Programming                      |   |         |   |         | Explore different websites, identify client-server components, and create a simple HTML page. |         |   |   | 1            |  |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | HTML Basics – Structure and Elements                      |   |         |   |         | Create a personal profile page using headings, paragraphs, lists, images, and links.          |         |   |   | 1            |  |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Advanced HTML – Forms, Tables, and Multimedia             |   |         |   |         | Build a registration form with various input types and a table displaying sample data.        |         |   |   | 1            |  |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | CSS Fundamentals – Styling and Layout                     |   |         |   |         | Apply styles to the profile page from Week 2, including fonts, colors, and backgrounds.       |         |   |   | 1            |  |

|                                                   |          |                                                                                                                                 |                |                  |                                                                                               |                          |  |         |  |
|---------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|-----------------------------------------------------------------------------------------------|--------------------------|--|---------|--|
|                                                   | 5        | Advanced CSS – Responsive Design and Animations                                                                                 |                |                  | Make the profile page responsive and add hover effects or simple animations to elements.      |                          |  | 1       |  |
|                                                   | 6        | Introduction to ASP and VBScript                                                                                                |                |                  | Create a basic ASP page that displays the current date, time, and simple calculations.        |                          |  | 2       |  |
|                                                   | 7        | Visa Exam                                                                                                                       |                |                  |                                                                                               |                          |  |         |  |
|                                                   | 8        | Server-Side Programming – Form Handling and Validation                                                                          |                |                  | Process the registration form from Week 3 using ASP and implement server-side validation.     |                          |  | 2       |  |
|                                                   | 9        | Database Fundamentals – Microsoft Access Basics                                                                                 |                |                  | Design a student database with tables, relationships, and sample queries.                     |                          |  | 3       |  |
|                                                   | 10       | Integrating ASP with Databases                                                                                                  |                |                  | Connect the ASP form to the Access database and save user input into a table.                 |                          |  | 2, 3    |  |
|                                                   | 11       | Advanced ASP and Database Techniques                                                                                            |                |                  | Implement data update, delete, and retrieval functionality for the database through ASP.      |                          |  | 2, 3    |  |
|                                                   | 12       | Building Dynamic Web Applications (Front-End & Back-End Integration)                                                            |                |                  | Combine HTML, CSS, ASP, and Access database to create a small interactive web application.    |                          |  | 1, 2, 3 |  |
|                                                   | 13       | Testing, Deployment, and Project Presentation                                                                                   |                |                  | Test and debug the web application, check for browser compatibility, and present the project. |                          |  | 1, 2, 3 |  |
|                                                   | 14       | Final Exam                                                                                                                      |                |                  |                                                                                               |                          |  |         |  |
| Evaluation Criteria                               | Method   |                                                                                                                                 | Contribution % | Source           | Relevant Qualifications                                                                       |                          |  |         |  |
|                                                   | 1        | Visa Exam                                                                                                                       | 30             | 1, 2             | PR2, PR3, PR4, PR6                                                                            |                          |  |         |  |
|                                                   | 2        | Final Exam                                                                                                                      | 50             | 1, 2, 3          | PR2, PR3, PR4, PR5, PR6                                                                       |                          |  |         |  |
|                                                   | 3        | Project                                                                                                                         | 20             | 1, 2, 3          | PR2, PR3, PR4, PR5, PR6, PR8, PR9                                                             |                          |  |         |  |
| Limitations on the Use of Artificial Intelligence | *        | No artificial intelligence methods or software are used in the instruction, learning activities, or assessments of this course. |                |                  |                                                                                               |                          |  |         |  |
| Learning Program                                  |          |                                                                                                                                 |                |                  |                                                                                               |                          |  |         |  |
| Educational Tool                                  | Quantity | Student Workload (Hours)                                                                                                        |                | Educational Tool | Quantity                                                                                      | Student Workload (Hours) |  |         |  |
| Weekly Theoretical and Practical Course Hours     | 12       | 3                                                                                                                               | 36             |                  |                                                                                               |                          |  |         |  |
| Visa Exam Preparation                             | 1        | 20                                                                                                                              | 20             |                  |                                                                                               |                          |  |         |  |
| Final Exam Preparation                            | 1        | 30                                                                                                                              | 30             |                  |                                                                                               |                          |  |         |  |
| Project                                           | 1        | 10                                                                                                                              | 10             |                  |                                                                                               |                          |  |         |  |
| Reading / Study                                   | 12       | 5                                                                                                                               | 60             |                  |                                                                                               |                          |  |         |  |
| Visa Exam                                         | 1        | 1                                                                                                                               | 1              |                  |                                                                                               |                          |  |         |  |

|                                                                                                                                      |   |     |   |                                              |     |  |               |  |     |
|--------------------------------------------------------------------------------------------------------------------------------------|---|-----|---|----------------------------------------------|-----|--|---------------|--|-----|
| Final Exam                                                                                                                           | 1 | 2   | 2 |                                              |     |  |               |  |     |
| Total Workload                                                                                                                       |   | 159 |   | Estimated ECTS Credit (Total Workload/ 30) : | 5.3 |  | Approximately |  | 5.3 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |   |     |   |                                              |     |  |               |  |     |

|                                                                           |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
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| NEAR EAST UNIVERSITY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
| INFORMATION SYSTEMS ENGINEERING                                           |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
| COURSE SYLLABUS                                                           |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
| Course Code: AII006                                                       |                                                                                                                                                                                                                                                                                                                                                | Course Name: Webpage Design and Programming                                                                                                                                           |             |                   |         | Course Status: Compulsory |      | Credits: 3   |      | ECTS: 4            |       |
| Course Language: English                                                  |                                                                                                                                                                                                                                                                                                                                                | Type of Course: Face-to-face                                                                                                                                                          |             | Prerequisite: -   |         | Year: 2                   |      | Term: Spring |      | Continuation: % 70 |       |
| Weekly Class Hours                                                        | Class time                                                                                                                                                                                                                                                                                                                                     | Laboratory                                                                                                                                                                            | Application | Learning Sessions |         |                           |      |              |      |                    |       |
|                                                                           | 3                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                       |             | *PS               |         | *KR                       |      | *R           |      | *I                 |       |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       |             | 1                 |         | 1                         |      |              |      | 1                  |       |
| Learning Outcomes of the Course                                           | Upon completing this course, students will                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO1                                                                                                                                                                                                                                                                                                                                            | be able to explore, evaluate, discuss and gain experience on current web based technologies taking into account contextual factors and the ethical, logical, and cultural dimensions. |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO2                                                                                                                                                                                                                                                                                                                                            | be able to understand and apply design principles around typography, color, layout, content, structuring, navigation and accessibility issues.                                        |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO3                                                                                                                                                                                                                                                                                                                                            | be able to use available technology as an aid to effective written, verbal, and visual communication to design, code, debug, test and document web sites.                             |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO4                                                                                                                                                                                                                                                                                                                                            | be able to understand the web server administration.                                                                                                                                  |             |                   |         |                           |      |              |      |                    |       |
| The Relationship Between Learning Outcomes and Program Competencies       |                                                                                                                                                                                                                                                                                                                                                | PR** 1                                                                                                                                                                                | PR 2        | PR 3              | PR 4    | PR 5                      | PR 6 | PR 7         | PR 8 | PR 9               | PR 10 |
|                                                                           | LO1                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO2                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO3                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO4                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | Contribution Level                                                                                                                                                                                                                                                                                                                             | 1: None                                                                                                                                                                               | 2: Weak     | 3: Middle         | 4: Good | 5: Very good              |      |              |      |                    |       |
| Course Description                                                        | History of the internet. Basic Colour Theory. Web Graphics. Accessibility. HyperText Markup Language (HTML). HTML5. Cascading Style Sheets (CSS). CSS3. Javascript. Page Layout. Design Issues. Responsive Web Design.                                                                                                                         |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
| Course Objectives                                                         | To teach the basics and the history of the www and internet. To provide students with a comprehensive mastery of HyperText Markup Language (HTML5) coding practices. To teach the Cascading Style Sheets (CSS3), Responsive Web Design principles and Javascript usage. To teach the design, implementation and maintenance stages of websites |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
| Textbook / Resources                                                      | 1                                                                                                                                                                                                                                                                                                                                              | Morris T., Web Development and Design Foundations with HTML5, Global Edition, 10/E, Pearson, 2021                                                                                     |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | 2                                                                                                                                                                                                                                                                                                                                              | Morris T., Basics of Web Design: HTML5 & CSS, 6/e, Pearson, 2022                                                                                                                      |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | 3                                                                                                                                                                                                                                                                                                                                              | Robbins J. N., Learning Web Design, A Beginner's Guide to (X)HTML, Style Sheets, and Web Graphics, 4th Edition, O'Reilly, 2012                                                        |             |                   |         |                           |      |              |      |                    |       |
|                                                                           | 4                                                                                                                                                                                                                                                                                                                                              | Online materyaller                                                                                                                                                                    |             |                   |         |                           |      |              |      |                    |       |
| Teaching Methods of the Course                                            | Problem Solving Method, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                   |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |
| Course Content                                                            | HTML Basics. Configuring Colour and Text with CSS. Visual Elements and Graphics. Web Design. Page Layout with CSS. More on Links, Lists, and Layout. Tables. Forms. Website Development. Web Multimedia and Interactivity. E-Commerce Overview. Promotion for Web Developers. Introduction to JavaScript.                                      |                                                                                                                                                                                       |             |                   |         |                           |      |              |      |                    |       |



| NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS      |                                              |                                                                                                                                                                |             |                      |                           |         |            |              |         |                   |       |
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| COMPUTER ENGINEERING                                                |                                              |                                                                                                                                                                |             |                      |                           |         |            |              |         |                   |       |
| COURSE SYLLABUS                                                     |                                              |                                                                                                                                                                |             |                      |                           |         |            |              |         |                   |       |
| Course Code: AII102                                                 | Course Name: PROGRAMMING AND PROBLEM SOLVING |                                                                                                                                                                |             |                      | Course Status: COMPULSORY |         | Credits: 4 |              | ECTS: 5 |                   |       |
| Course Language: ENGLISH                                            | Type of Course: FACE-TO-FACE                 |                                                                                                                                                                |             | Prerequisite: COM106 |                           | Year: 1 |            | Term: SPRING |         | Continuation: %70 |       |
| Weekly Class Hours                                                  | Class time                                   | Laboratory                                                                                                                                                     | Application | Learning Sessions    |                           |         |            |              |         |                   |       |
|                                                                     | 3                                            | 2                                                                                                                                                              | 0           | *PS                  | *KR                       |         | *R         |              | *I      |                   |       |
|                                                                     |                                              |                                                                                                                                                                |             | 0                    | 0                         |         | 0          |              | 0       |                   |       |
| Learning Outcomes of the Course                                     | Upon completing this course, students will   |                                                                                                                                                                |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO1                                         | Understand the fundamental concepts of programming, including data types, variables, operators, and control structures, using the Python programming language. |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO2                                         | Apply conditional statements and iterative loops to develop algorithms that solve structured computational problems.                                           |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO3                                         | Demonstrate the ability to use built-in Python data structures such as lists, tuples, dictionaries, and sets for data organization and manipulation.           |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO4                                         | Develop modular programs by implementing user-defined functions to enhance reusability and code efficiency.                                                    |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO5                                         | Employ file handling techniques to read, write, and process data from external sources.                                                                        |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO6                                         | Utilize debugging and exception-handling methods to identify and correct logical and runtime errors in Python programs.                                        |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO7                                         | Analyze real-world problems and design algorithmic solutions that can be implemented through Python scripting.                                                 |             |                      |                           |         |            |              |         |                   |       |
|                                                                     | ►LO8                                         | Create well-documented and efficient Python programs that integrate multiple programming concepts to solve practical engineering or scientific problems.       |             |                      |                           |         |            |              |         |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies |                                              | PR 1                                                                                                                                                           | PR 2        | PR 3                 | PR 4                      | PR 5    | PR 6       | PR 7         | PR 8    | PR 9              | PR 10 |
|                                                                     | LO1                                          | 3                                                                                                                                                              | 5           | 3                    | 2                         | 1       | 1          | 2            | 2       | 2                 | 2     |
|                                                                     | LO 2                                         | 3                                                                                                                                                              | 5           | 4                    | 2                         | 2       | 2          | 3            | 2       | 2                 | 2     |
|                                                                     | LO 3                                         | 3                                                                                                                                                              | 5           | 4                    | 2                         | 3       | 2          | 3            | 2       | 2                 | 2     |



|                                           |               |                                                                          |                       |                                |                                |               |
|-------------------------------------------|---------------|--------------------------------------------------------------------------|-----------------------|--------------------------------|--------------------------------|---------------|
| <b>Topics to be Covered<br/>Each Week</b> | <b>Week</b>   | <b>Subject</b>                                                           |                       |                                | <b>Activities</b>              | <b>Source</b> |
|                                           | 1             | History of Computers and Programming, Introduction to Python Programming |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 2             | Syntax, Variables, Data Types, Operators, Input and Output               |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 3             | Control Structures and Loops                                             |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 4             | Nested Loops & Python Strings                                            |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 5             | User-Defined Functions & Problem Solving - Examples                      |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 6             | Review and Examples                                                      |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 7             | Visa Exam                                                                |                       |                                | -                              | 1&2           |
|                                           | 8             | Lists, Tuples, Sets, Dictionary                                          |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 9             | Modules                                                                  |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 10            | Error Handling and File Management                                       |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 11            | Problem Solving - Examples                                               |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 12            | Introduction to Object-Oriented Programming                              |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 13            | Review and Examples                                                      |                       |                                | Face-to-face Lecture           | 1&2           |
|                                           | 14            | Final Exam                                                               |                       |                                | -                              | 1&2           |
| <b>Evaluation Criteria</b>                | <b>Method</b> |                                                                          | <b>Contribution %</b> | <b>Source</b>                  | <b>Relevant Qualifications</b> |               |
|                                           | 1             | Midterm Exam                                                             | 20                    | Lecture notes & Textbook (1&2) | PR1-PR9                        |               |
|                                           | 2             | Final Exam                                                               | 35                    | Lecture notes & Textbook (1&2) | PR1-PR10                       |               |

|                                                                                                                                      |          |                                                                                                                                                                |    |                                |                                              |                          |     |               |     |
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|                                                                                                                                      | 3        | Assignment                                                                                                                                                     | 10 | Lecture notes & Textbook (1&2) | PR1-PR9                                      |                          |     |               |     |
|                                                                                                                                      | 4        | Project                                                                                                                                                        | 25 | Lecture notes & Textbook (1&2) | PR1-PR10                                     |                          |     |               |     |
|                                                                                                                                      | 5        | Quiz + Lab                                                                                                                                                     | 10 | Lecture notes & Textbook (1&2) | PR1-PR10                                     |                          |     |               |     |
|                                                                                                                                      | 6        | -                                                                                                                                                              | -  |                                |                                              |                          |     |               |     |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Students are allowed to use AI tools (e.g., ChatGPT, Copilot) only for debugging and learning support, not for submitting automatically generated assignments. |    |                                |                                              |                          |     |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |     |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |     |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |     |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |     |               |     |
| Learning Program                                                                                                                     |          |                                                                                                                                                                |    |                                |                                              |                          |     |               |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                                                                                       |    | Educational Tool               | Quantity                                     | Student Workload (Hours) |     |               |     |
| Lecture (theory)                                                                                                                     | 14       | 4                                                                                                                                                              | 56 | Quiz Preparation               | 1                                            | 4                        | 4   |               |     |
| Assignment                                                                                                                           | 1        | 6                                                                                                                                                              | 6  | Project                        | 1                                            | 14                       | 14  |               |     |
| Midterm Exam                                                                                                                         | 1        | 2                                                                                                                                                              | 2  | Preparation for Course         | 14                                           | 2                        | 28  |               |     |
| Preparation for Midterm Exam                                                                                                         | 1        | 14                                                                                                                                                             | 14 |                                |                                              |                          |     |               |     |
| Final Exam                                                                                                                           | 1        | 2                                                                                                                                                              | 2  |                                |                                              |                          |     |               |     |
| Preparation for Final Exam                                                                                                           | 1        | 16                                                                                                                                                             | 16 |                                |                                              |                          |     |               |     |
| Quiz + LAB                                                                                                                           | 1        | 2                                                                                                                                                              | 2  |                                |                                              |                          |     |               |     |
| Total Workload                                                                                                                       |          | 144                                                                                                                                                            |    |                                | Estimated ECTS Credit (Total Workload/ 30) : |                          | 4.8 | Approximately | 4.8 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                                                                                |    |                                |                                              |                          |     |               |     |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                                        |                                                                                                                                                                 |             |                           |      |            |      |              |      |                   |       |
|--------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------|------|------------|------|--------------|------|-------------------|-------|
| DEPARTMENT OF COMPUTER ENGINEERING                                       |                                                        |                                                                                                                                                                 |             |                           |      |            |      |              |      |                   |       |
| COURSE SYLLABUS                                                          |                                                        |                                                                                                                                                                 |             |                           |      |            |      |              |      |                   |       |
| Course Code: AII104                                                      | Course Name: Discrete Structures                       |                                                                                                                                                                 |             | Course Status: Compulsory |      | Credits: 3 |      | ECTS: 5      |      |                   |       |
| Course Language: English                                                 | Type of Course: Face to Face                           |                                                                                                                                                                 |             | Prerequisite: No          |      | Year: 1    |      | Term: Spring |      | Continuation: 70% |       |
| Weekly Class Hours                                                       | Class time                                             | Laboratory                                                                                                                                                      | Application | Learning Sessions         |      |            |      |              |      |                   |       |
|                                                                          | 3                                                      | 0                                                                                                                                                               | 0           | *PS                       | *KR  |            | *R   |              | *I   |                   |       |
|                                                                          |                                                        |                                                                                                                                                                 |             | 1                         | 1    |            | 1    |              | 1    |                   |       |
| Learning Outcomes of the Course                                          | Upon completing this course, students will be able to: |                                                                                                                                                                 |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO1                                                   | apply principles of logic and set theory to model and analyze computational problems.                                                                           |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO2                                                   | use mathematical reasoning and proof techniques (such as induction, contradiction, and direct proof) to establish the validity of statements.                   |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO3                                                   | understand and manipulate functions, relations, and algorithms to represent and solve discrete problems.                                                        |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO4                                                   | analyze and construct combinatorial structures such as permutations, combinations, and counting principles.                                                     |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO5                                                   | apply graph theory concepts (including trees, paths, connectivity, and traversals) to represent and solve real-world problems.                                  |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO6                                                   | use Boolean algebra and propositional logic in the design and simplification of digital circuits.                                                               |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO7                                                   | model and solve recurrence relations and discrete probability problems relevant to computer science and data analysis.                                          |             |                           |      |            |      |              |      |                   |       |
|                                                                          | ►LO8                                                   | demonstrate the ability to connect discrete mathematical concepts to computer science applications such as data structures, algorithms, and computation theory. |             |                           |      |            |      |              |      |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies      |                                                        | PR** 1                                                                                                                                                          | PR 2        | PR 3                      | PR 4 | PR 5       | PR 6 | PR 7         | PR 8 | PR 9              | PR 10 |
|                                                                          | LO1                                                    | 5                                                                                                                                                               | 4           | 5                         | 2    | 2          | 3    | 1            | 1    | 2                 | 3     |
|                                                                          | LO 2                                                   | 5                                                                                                                                                               | 4           | 5                         | 2    | 2          | 2    | 1            | 1    | 2                 | 4     |
|                                                                          | LO 3                                                   | 5                                                                                                                                                               | 5           | 5                         | 3    | 2          | 3    | 1            | 2    | 2                 | 3     |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                               |   |         |   |         |                                                              |           |         |        |              |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---|---------|---|---------|--------------------------------------------------------------|-----------|---------|--------|--------------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5                                                             | 4 | 5       | 3 | 2       | 2                                                            | 1         | 1       | 2      | 3            |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5                                                             | 5 | 5       | 4 | 3       | 4                                                            | 1         | 2       | 2      | 3            |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5                                                             | 3 | 5       | 4 | 3       | 5                                                            | 1         | 1       | 2      | 2            |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5                                                             | 4 | 5       | 3 | 4       | 3                                                            | 1         | 1       | 2      | 3            |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5                                                             | 5 | 5       | 4 | 3       | 4                                                            | 2         | 3       | 3      | 4            |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                               |   | 1: NONE |   | 2: Weak |                                                              | 3: MIDDLE | 4: GOOD |        | 5: VERY GOOD |
| Course Description             | This course covers the basic mathematical ideas used in computer science. Students learn about logic, sets, functions, relations, counting, graphs, and Boolean algebra. The course helps students understand how to use mathematical reasoning to solve problems, analyze algorithms, and design computer systems. By the end of the course, students will be able to apply these concepts to real examples in computing and information technology. |                                                               |   |         |   |         |                                                              |           |         |        |              |
| Course Objectives              | The objective of this course is to equip students with the ability to think mathematically and reason logically about discrete problems in computer science. By the end of the course, students will be able to construct proofs, solve combinatorial and graph-related problems, analyze algorithms, and apply discrete mathematical concepts to real-world computing challenges.                                                                    |                                                               |   |         |   |         |                                                              |           |         |        |              |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Discrete Mathematics and Its Applications by Kenneth H. Rosen |   |         |   |         |                                                              |           |         |        |              |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Discrete Mathematics with Applications by Susanna S. Epp      |   |         |   |         |                                                              |           |         |        |              |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Discrete Mathematics: An Open Introduction by Oscar Levin     |   |         |   |         |                                                              |           |         |        |              |
| Teaching Methods of the Course | Lecture Method, Discussion Method, and Question-Answer Method                                                                                                                                                                                                                                                                                                                                                                                         |                                                               |   |         |   |         |                                                              |           |         |        |              |
| Course Content                 | This course covers the fundamental concepts of discrete mathematics used in computer science. Students will learn about logic, sets, relations, functions, proofs, combinatorics, graph theory, Boolean algebra, and probability. The course focuses on understanding these concepts and applying them to solve problems in computing and related fields.                                                                                             |                                                               |   |         |   |         |                                                              |           |         |        |              |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Subject                                                       |   |         |   |         | Activities                                                   |           |         | Source |              |
|                                | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Introduction to Discrete Mathematics                          |   |         |   |         | Class discussion on applications of discrete mathematics     |           |         | 1      |              |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Logic and Propositional Calculus                              |   |         |   |         | Solve truth table exercises and logical equivalence problems |           |         | 3      |              |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Set Theory                                                    |   |         |   |         | Venn diagram problems and set operations                     |           |         | 2      |              |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Relations                                                     |   |         |   |         | Identify and classify relations from examples                |           |         | 1      |              |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Functions                                                     |   |         |   |         | Exercises on function types and compositions                 |           |         | 3      |              |
|                                | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Proof Techniques                                              |   |         |   |         | Practice proofs using direct, contradiction, and induction   |           |         | 2      |              |

|                                                   |        |                                                                                                                                 |                          |         |                                                                     |  |          |                          |  |  |     |
|---------------------------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------|---------------------------------------------------------------------|--|----------|--------------------------|--|--|-----|
|                                                   | 7      | Visa Exam                                                                                                                       |                          |         |                                                                     |  |          |                          |  |  |     |
|                                                   | 8      | Combinatorics                                                                                                                   |                          |         | Counting problems: permutations, combinations, and Binomial Theorem |  |          | 3                        |  |  |     |
|                                                   | 9      | Graph Theory                                                                                                                    |                          |         | Draw graphs, find paths, and classify graph types                   |  |          | 1                        |  |  |     |
|                                                   | 10     | Boolean Algebra                                                                                                                 |                          |         | Simplify Boolean expressions and practice with truth tables         |  |          | 2                        |  |  |     |
|                                                   | 11     | Logic Circuits                                                                                                                  |                          |         | Design and simulate basic logic circuits                            |  |          | 1                        |  |  |     |
|                                                   | 12     | Recurrence Relations and Discrete Probability                                                                                   |                          |         | Solve recurrence relations and probability counting exercises       |  |          | 3                        |  |  |     |
|                                                   | 13     | Review                                                                                                                          |                          |         | Comprehensive exercises and problem-solving session                 |  |          | 2                        |  |  |     |
|                                                   | 14     | Final Exam                                                                                                                      |                          |         |                                                                     |  |          |                          |  |  |     |
| Evaluation Criteria                               | Method |                                                                                                                                 | Contribution %           | Source  | Relevant Qualifications                                             |  |          |                          |  |  |     |
|                                                   | 1      | Visa Exam                                                                                                                       | 40%                      | 1, 2, 3 | PR1, PR2, PR3, PR6, PR10                                            |  |          |                          |  |  |     |
|                                                   | 2      | Final Exam                                                                                                                      | 50%                      | 1, 2, 3 | PR1, PR2, PR3, PR6, PR10                                            |  |          |                          |  |  |     |
|                                                   | 3      | Homeworks                                                                                                                       | 10%                      | 1, 2, 3 | PR1, PR2, PR3, PR6, PR10                                            |  |          |                          |  |  |     |
| Limitations on the Use of Artificial Intelligence | *      | No artificial intelligence methods or software are used in the instruction, learning activities, or assessments of this course. |                          |         |                                                                     |  |          |                          |  |  |     |
| Learning Program                                  |        |                                                                                                                                 |                          |         |                                                                     |  |          |                          |  |  |     |
| Educational Tool                                  |        | Quantity                                                                                                                        | Student Workload (Hours) |         | Educational Tool                                                    |  | Quantity | Student Workload (Hours) |  |  |     |
| Weekly Theoretical Course Hours                   |        | 12                                                                                                                              | 3                        | 36      |                                                                     |  |          |                          |  |  |     |
| Visa Exam Preparation                             |        | 1                                                                                                                               | 10                       | 10      |                                                                     |  |          |                          |  |  |     |
| Final Exam Preparation                            |        | 1                                                                                                                               | 20                       | 20      |                                                                     |  |          |                          |  |  |     |
| Homeworks                                         |        | 5                                                                                                                               | 3                        | 15      |                                                                     |  |          |                          |  |  |     |
| Reading / Study                                   |        | 12                                                                                                                              | 5                        | 60      |                                                                     |  |          |                          |  |  |     |
| Visa Exam                                         |        | 1                                                                                                                               | 1                        | 1       |                                                                     |  |          |                          |  |  |     |
| Final Exam                                        |        | 1                                                                                                                               | 2                        | 2       |                                                                     |  |          |                          |  |  |     |
| Total Workload                                    |        |                                                                                                                                 | 144                      |         | Estimated ECTS Credit (Total Workload/ 30) :                        |  | 4.8      | Approximately            |  |  | 4.8 |

|                                                                                                                                      |  |  |
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| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------|--|--|

\*\* Program  
Requirements

| NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS      |                                             |                                                                                                                             |             |                           |      |            |      |            |      |                   |       |
|---------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------|------|------------|------|------------|------|-------------------|-------|
| COMPUTER ENGINEERING                                                |                                             |                                                                                                                             |             |                           |      |            |      |            |      |                   |       |
| COURSE SYLLABUS                                                     |                                             |                                                                                                                             |             |                           |      |            |      |            |      |                   |       |
| Course Code: AII201                                                 | Course Name: DATA STRUCTURES AND ALGORITHMS |                                                                                                                             |             | Course Status: COMPULSORY |      | Credits: 4 |      | ECTS: 6    |      |                   |       |
| Course Language: ENGLISH                                            | Type of Course: FACE-TO-FACE                |                                                                                                                             |             | Prerequisite: AII102      |      | Year: 2    |      | Term: FALL |      | Continuation: %70 |       |
| Weekly Class Hours                                                  | Class time                                  | Laboratory                                                                                                                  | Application | Learning Sessions         |      |            |      |            |      |                   |       |
|                                                                     | 3                                           | 2                                                                                                                           | 0           | *PS                       | *KR  |            | *R   |            | *I   |                   |       |
|                                                                     |                                             |                                                                                                                             |             | 0                         | 0    |            | 0    |            | 0    |                   |       |
| Learning Outcomes of the Course                                     | Upon completing this course, students will  |                                                                                                                             |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO1                                        | Understand the fundamental concepts of algorithms, data structures, and computational complexity using Python.              |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO2                                        | Apply algorithmic problem-solving strategies to analyze and implement efficient solutions for computational problems.       |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO3                                        | Implement and manipulate core Python data structures such as lists, stacks, queues, linked lists, and dictionaries.         |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO4                                        | Design and implement tree and graph data structures, including traversal, searching, and shortest-path algorithms.          |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO5                                        | Analyze algorithm performance using Big-O notation and compare time and space complexities of different algorithms.         |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO6                                        | Employ sorting and searching algorithms (e.g., QuickSort, MergeSort, Binary Search) to manage and process data effectively. |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO7                                        | Utilize recursion, dynamic programming, and divide-and-conquer approaches to solve complex computational problems.          |             |                           |      |            |      |            |      |                   |       |
|                                                                     | ►LO8                                        | Evaluate and select appropriate data structures and algorithms to optimize real-world software applications.                |             |                           |      |            |      |            |      |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies |                                             | PR 1                                                                                                                        | PR 2        | PR 3                      | PR 4 | PR 5       | PR 6 | PR 7       | PR 8 | PR 9              | PR 10 |
|                                                                     | LO1                                         | 3                                                                                                                           | 4           | 5                         | 3    | 3          | 2    | 2          | 3    | 3                 | 2     |
|                                                                     | LO 2                                        | 4                                                                                                                           | 5           | 5                         | 3    | 4          | 4    | 3          | 3    | 3                 | 2     |
|                                                                     | LO 3                                        | 4                                                                                                                           | 5           | 5                         | 3    | 4          | 4    | 3          | 4    | 3                 | 2     |



|                                       |               |                                                               |                       |                                |                                |               |
|---------------------------------------|---------------|---------------------------------------------------------------|-----------------------|--------------------------------|--------------------------------|---------------|
| <b>Topics to be Covered Each Week</b> | <b>Week</b>   | <b>Subject</b>                                                |                       |                                | <b>Activities</b>              | <b>Source</b> |
|                                       | 1             | Introduction to Object-Oriented Programming + Data Structures |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 2             | Arrays and Strings & Python Implementations                   |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 3             | Linked Lists & Python Implementations                         |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 4             | Stacks & Python Implementations                               |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 5             | Algorithm Complexity & Big-O Notation                         |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 6             | Queues & Python Implementations                               |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 7             | Visa Exam                                                     |                       |                                | -                              | 1, 2, 3 & 4   |
|                                       | 8             | Trees & Python Implementations                                |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 9             | Graphs & Python Implementations                               |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 10            | Sorting Algorithms using Python                               |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 11            | Searching Algorithms using Python                             |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 12            | Real-Life Examples                                            |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 13            | Review and Examples                                           |                       |                                | Face-to-face Lecture           | 1, 2, 3 & 4   |
|                                       | 14            | Final Exam                                                    |                       |                                | -                              | 1, 2, 3 & 4   |
| <b>Evaluation Criteria</b>            | <b>Method</b> |                                                               | <b>Contribution %</b> | <b>Source</b>                  | <b>Relevant Qualifications</b> |               |
|                                       | 1             | Midterm Exam                                                  | 25                    | Lecture notes & Textbook (1&2) | PR1-PR9                        |               |
|                                       | 2             | Final Exam                                                    | 35                    | Lecture notes & Textbook (1&2) | PR1-PR10                       |               |

|                                                                                                                                      |          |                                                                                                                                                                |    |                                |                                              |                          |          |               |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------|----------------------------------------------|--------------------------|----------|---------------|-----|
|                                                                                                                                      | 3        | Assignment                                                                                                                                                     | 10 | Lecture notes & Textbook (1&2) | PR1-PR10                                     |                          |          |               |     |
|                                                                                                                                      | 4        | Project                                                                                                                                                        | 20 | Lecture notes & Textbook (1&2) | PR1-PR10                                     |                          |          |               |     |
|                                                                                                                                      | 5        | Quiz + Lab                                                                                                                                                     | 10 | Lecture notes & Textbook (1&2) | PR1-PR9                                      |                          |          |               |     |
|                                                                                                                                      | 6        | -                                                                                                                                                              | -  |                                |                                              |                          |          |               |     |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Students are allowed to use AI tools (e.g., ChatGPT, Copilot) only for debugging and learning support, not for submitting automatically generated assignments. |    |                                |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                |                                              |                          |          |               |     |
| Learning Program                                                                                                                     |          |                                                                                                                                                                |    |                                |                                              |                          |          |               |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                                                                                       |    | Educational Tool               | Quantity                                     | Student Workload (Hours) |          |               |     |
| Lecture (theory)                                                                                                                     | 14       | 4                                                                                                                                                              | 56 | Quiz Preparation               | 2                                            | 4                        | 8        |               |     |
| Assignment                                                                                                                           | 2        | 8                                                                                                                                                              | 16 | Project                        | 1                                            | 14                       | 14       |               |     |
| Midterm Exam                                                                                                                         | 1        | 2                                                                                                                                                              | 2  | Preparation for Course         | 14                                           | 2                        | 28       |               |     |
| Preparation for Midterm Exam                                                                                                         | 1        | 16                                                                                                                                                             | 16 | Presentation                   | 1                                            | 1                        | 1        |               |     |
| Final Exam                                                                                                                           | 1        | 2                                                                                                                                                              | 2  | Preparation for Presentation   | 1                                            | 12                       | 12       |               |     |
| Preparation for Final Exam                                                                                                           | 1        | 16                                                                                                                                                             | 16 |                                |                                              |                          |          |               |     |
| Quiz + LAB                                                                                                                           | 2        | 2                                                                                                                                                              | 4  |                                |                                              |                          |          |               |     |
| Total Workload                                                                                                                       |          | 175                                                                                                                                                            |    |                                | Estimated ECTS Credit (Total Workload/ 30) : |                          | 5.833333 | Approximately | 5.8 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                                                                                |    |                                |                                              |                          |          |               |     |

\*\* Program Requirements

| NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS FACULTY |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |  |
|------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|---------|-----------|--------|--------|-------------------|------|-------|--|
| COMPUTER ENGINEERING DEPARTMENT                                        |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |  |
| COURSE SYLLABUS                                                        |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |  |
| Course Code:<br>AII202                                                 | Course Name:DATABASE MANAGEMENT<br>SYSTEMS |                                                                                                                                                                 |                    | Course Status:<br>COMPULSORY |         | Credits:4 |        | ECTS:6 |                   |      |       |  |
| Course Language:<br>ENGLISH                                            | Type of Course:FACE TO FACE                |                                                                                                                                                                 | Prerequisite: NONE |                              | Year: 2 |           | Term:4 |        | Continuation: %70 |      |       |  |
| Weekly Class<br>Hours                                                  | Class<br>time                              | Laboratory                                                                                                                                                      | Application        | Learning Sessions            |         |           |        |        |                   |      |       |  |
|                                                                        | 3                                          | 1                                                                                                                                                               | .0                 | *PS                          | *KR     |           | *R     |        | *I                |      |       |  |
|                                                                        |                                            |                                                                                                                                                                 |                    | 4                            | 4       |           | 0      |        | 0                 |      |       |  |
| Learning<br>Outcomes of the<br>Course                                  | Upon completing this course, students will |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO1                                      | Ability to understand and apply knowledge of mathematics, science, and engineering                                                                              |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO2                                      | An ability to analyze a problem, identify and define the computing requirements appropriate to its solution                                                     |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO3                                      | An ability to apply mathematical foundations, algorithmic principles, and computer engineering techniques in the modelling and design of computer-based systems |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO4                                      | An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social aspects         |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO5                                      | Planning and carrying out experiments, as well as to analyze and interpret data                                                                                 |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO6                                      | Ability to use the techniques, skills and modern engineering tools necessary for engineering practice                                                           |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO7                                      | An understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering                                     |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO8                                      | An ability to work productively in a multidisciplinary team, in particular to carry out projects involving computer engineering skills                          |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► LO9                                      | An ability to communicate effectively with a range of audiences                                                                                                 |                    |                              |         |           |        |        |                   |      |       |  |
|                                                                        | ► L10                                      | A recognition of the need for, and an ability to engage in life-long learning                                                                                   |                    |                              |         |           |        |        |                   |      |       |  |
| The Relationship<br>Between Learning<br>Outcomes and<br>Program        |                                            | PR** 1                                                                                                                                                          | PR 2               | PR 3                         | PR 4    | PR 5      | PR 6   | PR 7   | PR 8              | PR 9 | PR 10 |  |
|                                                                        | LO1                                        | 2                                                                                                                                                               | 2                  | 1                            | 1       | 2         | 2      | 1      | 1                 | 2    | 3     |  |



|                                |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       |                |            |                                          |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------|------------|------------------------------------------|
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                             |                                       |                |            |                                          |
| Teaching Methods of the Course | Lectures, Problem Solving,Question-Answer                                                                                                                                                                                                                                                                                                                                                                                     |                                       |                |            |                                          |
| Course Content                 | Database architecture, comparison to file-based systems, historical data models, conceptual model; integrity constraints and triggers; functional dependencies and normal forms; relational model, relational algebra, database processing and Structured Query Language (SQL), Dynamic SQL, Stored Procedures. Emerging trends, O.O. Database Model. Internet & Databases. Study of Oracle, MsSql and MySql as popular DBMS. |                                       |                |            |                                          |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                                                                                                                                          | Subject                               |                | Activities | Source                                   |
|                                | 1                                                                                                                                                                                                                                                                                                                                                                                                                             | Introduction to Database Systems      |                | KR         | 1&2                                      |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                             | Relational Model                      |                | KR         | 1&2                                      |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                             | Relational Algebra                    |                | KR, PS     | 1&2                                      |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                             | Database Application Development      |                | KR, PS     | 1&2                                      |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                             | Normalization                         |                | KR, PS     | 1&2                                      |
|                                | 6                                                                                                                                                                                                                                                                                                                                                                                                                             | Normalization practice and assignment |                | KR, PS     | 1&2                                      |
|                                | 7                                                                                                                                                                                                                                                                                                                                                                                                                             | Examination (Mid term)                |                | KR, PS     | 1&2                                      |
|                                | 8                                                                                                                                                                                                                                                                                                                                                                                                                             | Structured Query Language (SQL)       |                | KR, PS     | 1&2                                      |
|                                | 9                                                                                                                                                                                                                                                                                                                                                                                                                             | SQL practice and assignment           |                | KR, PS     | 1&2                                      |
|                                | 10                                                                                                                                                                                                                                                                                                                                                                                                                            | DB Management Tools                   |                | PS         | 1&2                                      |
|                                | 11                                                                                                                                                                                                                                                                                                                                                                                                                            | Stored Procedures and views           |                | KR, PS     | 1&2                                      |
|                                | 12                                                                                                                                                                                                                                                                                                                                                                                                                            | Popular DBMS review                   |                | PS         | 1&2                                      |
|                                | 13                                                                                                                                                                                                                                                                                                                                                                                                                            | Emerging trends in DBMS               |                | PS         | 1&2                                      |
|                                | 14                                                                                                                                                                                                                                                                                                                                                                                                                            | Examination (Final)                   |                | PS         | 1&2                                      |
| Evaluation Criteria            | Method                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       | Contribution % | Source     | Relevant Qualifications                  |
|                                | 1                                                                                                                                                                                                                                                                                                                                                                                                                             | Midterm Exam                          | 40             | 1&2        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                             | Final Exam                            | 50             | 1&2        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                             | Project                               | 10             | 1&2        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                             |                                       |                |            |                                          |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                             |                                       |                |            |                                          |
|                                | 6                                                                                                                                                                                                                                                                                                                                                                                                                             |                                       |                |            |                                          |

|                                                                                                                                      |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|------------------------------------------------------|----------|--------------------------|---------------|--|--|--|--|-----|
| Limitations on the Use of Artificial Intelligence                                                                                    | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Learning Program                                                                                                                     |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                                     | Quantity | Student Workload (Hours) |               |  |  |  |  |     |
| Course Hours                                                                                                                         | 14       | 14x3                     | 42 | Knowledge Reinforcement and Problem Solving Sessions | 7        | 4x7                      | 28            |  |  |  |  |     |
| Preparation for the Course:                                                                                                          | 14       | 14x3                     | 42 |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 1                                                                                                                   | 1        | 1x4                      | 4  |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 2                                                                                                                   |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 3                                                                                                                   |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| In-Class Discussion/Practice                                                                                                         | 2        | 2x6                      | 12 |                                                      |          |                          |               |  |  |  |  |     |
| Preparation for Activities                                                                                                           | 2        | 2x24                     | 48 |                                                      |          |                          |               |  |  |  |  |     |
| Total Workload                                                                                                                       |          | 176                      |    | Estimated ECTS Credit (Total Workload/ 30) :         |          | 5.866667                 | Approximately |  |  |  |  | 5.9 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |

\*\* Program Requirements

| NEAR EAST UNIVERSITY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                                                                                                                                                                                                   |                                                                                                                                                                   |                      |                   |         |                           |      |              |      |                    |       |
|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------|---------|---------------------------|------|--------------|------|--------------------|-------|
| COMPUTER ENGINEERING                                                      |                                                                                                                                                                                                                   |                                                                                                                                                                   |                      |                   |         |                           |      |              |      |                    |       |
| COURSE SYLLABUS                                                           |                                                                                                                                                                                                                   |                                                                                                                                                                   |                      |                   |         |                           |      |              |      |                    |       |
| Course Code: AII203                                                       |                                                                                                                                                                                                                   | Course Name: Computer Architecture and Organization                                                                                                               |                      |                   |         | Course Status: Compulsory |      | Credits: 4   |      | ECTS: 6            |       |
| Course Language: English                                                  |                                                                                                                                                                                                                   | Type of Course: Face-to-face                                                                                                                                      | Prerequisite: AII001 |                   |         | Year: 2                   |      | Term: Spring |      | Continuation: % 70 |       |
| Weekly Class Hours                                                        | Class time                                                                                                                                                                                                        | Laboratory                                                                                                                                                        | Application          | Learning Sessions |         |                           |      |              |      |                    |       |
|                                                                           | 4                                                                                                                                                                                                                 |                                                                                                                                                                   |                      | *PS               |         | *KR                       |      | *R           |      | *I                 |       |
|                                                                           |                                                                                                                                                                                                                   |                                                                                                                                                                   |                      | 1                 |         | 1                         |      | 1            |      | 1                  |       |
| Learning Outcomes of the Course                                           | Upon completing this course, students will                                                                                                                                                                        |                                                                                                                                                                   |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO1                                                                                                                                                                                                               | be able to understand the computer architecture and organization principles.                                                                                      |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO2                                                                                                                                                                                                               | be able to understand how the processor operate.                                                                                                                  |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO3                                                                                                                                                                                                               | be able to write programs in assembly language.                                                                                                                   |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO4                                                                                                                                                                                                               | be able to understand the memory organization.                                                                                                                    |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO5                                                                                                                                                                                                               | be able to explain the storage and other input/output topics.                                                                                                     |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO6                                                                                                                                                                                                               | be able to understand the Multicores, Multiprocessors and Clusters.                                                                                               |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO7                                                                                                                                                                                                               | be able to measure and compare performances of different systems.                                                                                                 |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | LO8                                                                                                                                                                                                               | be able to understand the interaction between hardware and software.                                                                                              |                      |                   |         |                           |      |              |      |                    |       |
| The Relationship Between Learning Outcomes and Program Competencies       |                                                                                                                                                                                                                   | PR** 1                                                                                                                                                            | PR 2                 | PR 3              | PR 4    | PR 5                      | PR 6 | PR 7         | PR 8 | PR 9               | PR 10 |
|                                                                           | LO1                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | LO2                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | LO3                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | LO4                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | LO5                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | LO6                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | LO7                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | LO8                                                                                                                                                                                                               | 5                                                                                                                                                                 | 5                    | 5                 | 5       | 1                         | 5    | 5            | 2    | 1                  | 5     |
|                                                                           | Contribution Level                                                                                                                                                                                                | 1: None                                                                                                                                                           | 2: Weak              | 3: Middle         | 4: Good | 5: Very good              |      |              |      |                    |       |
| Course Description                                                        | Arithmetic for computers. Introduction to computer architecture and organization. The Processor. Assembly programming. Memory organization. Input/output organization. Multicores, Multiprocessors, and Clusters. |                                                                                                                                                                   |                      |                   |         |                           |      |              |      |                    |       |
| Course Objectives                                                         | To teach the interaction between hardware and software. To give the fundamental organization of the computers. To teach the assembly language programming                                                         |                                                                                                                                                                   |                      |                   |         |                           |      |              |      |                    |       |
| Textbook / Resources                                                      | 1                                                                                                                                                                                                                 | Patterson D.A. and Hennessy J.L., Computer Organization and Design, The Hardware/Software Interface, ARM Edition, Morgan Kaufmann, 2017                           |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | 2                                                                                                                                                                                                                 | Companion website ( <a href="http://booksite.elsevier.com/9780128017333/?ISBN=9780128017333">http://booksite.elsevier.com/9780128017333/?ISBN=9780128017333</a> ) |                      |                   |         |                           |      |              |      |                    |       |
|                                                                           | 3                                                                                                                                                                                                                 | Patterson D.A. and Hennessy J.L., Computer Organization and Design RISC-V Edition 2nd Edition, Morgan Kaufmann, 2020                                              |                      |                   |         |                           |      |              |      |                    |       |

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|------------------|----------------------------------|----------|--------------------------|----|--|--|
|                                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                       | Companion website ( <a href="https://www.elsevier.com/books-and-journals/book-companion/9780128203316">https://www.elsevier.com/books-and-journals/book-companion/9780128203316</a> ) |                          |        |                  |                                  |          |                          |    |  |  |
|                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                       | Online materials                                                                                                                                                                      |                          |        |                  |                                  |          |                          |    |  |  |
| Teaching Methods of the Course                    | Problem Solving Method, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
| Course Content                                    | Computer Abstractions and Technology. Instructions: Language of the Computer. A Survey of RISC Architectures for Desktop, Server, and Embedded Computers. Arithmetic for Computers. The Basics of Logic Design. The Processor, Mapping Control to Hardware. Large and Fast Exploiting Memory Hierarchy. Storage and other IO Topics. Parallel Processors from Client to Cloud. Graphics Processor Units |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
| Topics to be Covered Each Week                    | Week                                                                                                                                                                                                                                                                                                                                                                                                    | Subject                                                                                                                                                                               |                          |        |                  | Activities                       |          | Source                   |    |  |  |
|                                                   | 1                                                                                                                                                                                                                                                                                                                                                                                                       | Introduction, Computer Abstractions and Technology                                                                                                                                    |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 2                                                                                                                                                                                                                                                                                                                                                                                                       | Computer Abstractions and Technology                                                                                                                                                  |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 3                                                                                                                                                                                                                                                                                                                                                                                                       | Instructions: Language of the Computer                                                                                                                                                |                          |        |                  | PS,KR,R,I                        |          | 1,-,5                    |    |  |  |
|                                                   | 4                                                                                                                                                                                                                                                                                                                                                                                                       | Instructions: Language of the Computer                                                                                                                                                |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 5                                                                                                                                                                                                                                                                                                                                                                                                       | A Survey of RISC Architectures for Desktop, Server, and Embedded Computers                                                                                                            |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 6                                                                                                                                                                                                                                                                                                                                                                                                       | Arithmetic for Computers                                                                                                                                                              |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 7                                                                                                                                                                                                                                                                                                                                                                                                       | The Basics of Logic Design                                                                                                                                                            |                          |        |                  | PS,KR,R,I                        |          | 1,-,5                    |    |  |  |
|                                                   | 8                                                                                                                                                                                                                                                                                                                                                                                                       | Midterm exam                                                                                                                                                                          |                          |        |                  |                                  |          |                          |    |  |  |
|                                                   | 9                                                                                                                                                                                                                                                                                                                                                                                                       | The Processor, Mapping Control to Hardware                                                                                                                                            |                          |        |                  | PS,KR,R,I                        |          | 1,-,5                    |    |  |  |
|                                                   | 10                                                                                                                                                                                                                                                                                                                                                                                                      | Large and Fast Exploiting Memory Hierarchy                                                                                                                                            |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 11                                                                                                                                                                                                                                                                                                                                                                                                      | Large and Fast Exploiting Memory Hierarchy, Storage and other IO Topics                                                                                                               |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 12                                                                                                                                                                                                                                                                                                                                                                                                      | Parallel Processors from Client to Cloud                                                                                                                                              |                          |        |                  | PS,KR,R,I                        |          | 1,-,5                    |    |  |  |
|                                                   | 13                                                                                                                                                                                                                                                                                                                                                                                                      | Parallel Processors from Client to Cloud                                                                                                                                              |                          |        |                  | PS,KR,I                          |          | 1,-,5                    |    |  |  |
|                                                   | 14                                                                                                                                                                                                                                                                                                                                                                                                      | Graphics Processor Units                                                                                                                                                              |                          |        |                  | PS,KR,R,I                        |          | 1,-,5                    |    |  |  |
|                                                   | 15                                                                                                                                                                                                                                                                                                                                                                                                      | Review of the Semester.                                                                                                                                                               |                          |        |                  | PS,KR,R,I                        |          | 1,-,5                    |    |  |  |
| 16                                                | Final exam                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
| Evaluation Criteria                               | Method                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                       | Contribution %           | Source |                  | Relevant Qualifications          |          |                          |    |  |  |
|                                                   | 1                                                                                                                                                                                                                                                                                                                                                                                                       | Midterm exam                                                                                                                                                                          | 40                       | 1,-,5  |                  | PR1,PR2,PR3,PR4,PR6,PR7,PR10     |          |                          |    |  |  |
|                                                   | 3                                                                                                                                                                                                                                                                                                                                                                                                       | Final exam                                                                                                                                                                            | 60                       | 1,-,5  |                  | PR1,PR2,PR3,PR4,PR6,PR7,PR8,PR10 |          |                          |    |  |  |
| Limitations on the Use of Artificial Intelligence | * The use of AI tools should not conflict with the existing principles and policies of Near East University.                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
|                                                   | * AI tool responses can be biased, inaccurate or misleading and is further limited by their last software update. Students should not let AI tools generate facts also skip critical thinking by accepting AI generated answers without verification.                                                                                                                                                   |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
|                                                   | * Transparency is essential in the use of AI tools. Students should specified where, why, and how they used AI tools in the bibliography and acknowledgements sections.                                                                                                                                                                                                                                 |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
|                                                   | * It is each student's responsibility to follow the guidelines and ensure their work meets academic integrity standards. Inappropriate use of the AI tools will be considered academic misconduct, resulting in a zero grade.                                                                                                                                                                           |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
| Learning Program                                  |                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                       |                          |        |                  |                                  |          |                          |    |  |  |
| Educational Tool                                  |                                                                                                                                                                                                                                                                                                                                                                                                         | Quantity                                                                                                                                                                              | Student Workload (Hours) |        | Educational Tool |                                  | Quantity | Student Workload (Hours) |    |  |  |
| Course duration in class                          |                                                                                                                                                                                                                                                                                                                                                                                                         | 14                                                                                                                                                                                    | 4                        | 52     | Midterm exam     |                                  | 1        | 28                       | 28 |  |  |
| Self-Study                                        |                                                                                                                                                                                                                                                                                                                                                                                                         | 14                                                                                                                                                                                    | 4                        | 52     | Final exam       |                                  | 1        | 48                       | 48 |  |  |

|                                                                                                                                                                    |            |                                                         |          |                      |  |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------|----------|----------------------|--|----------|
| <b>Total Workload</b>                                                                                                                                              | <b>180</b> | <b>Estimated ECTS Credit<br/>(Total Workload/ 30) :</b> | <b>6</b> | <b>Approximately</b> |  | <b>6</b> |
| <b>* For activities: PS:</b> Problem Solving Sessions, <b>KR:</b> Knowledge Reinforcement Sessions, <b>R:</b> Remedial Sessions, <b>I:</b> Instructor-led Sessions |            |                                                         |          |                      |  |          |
| ** Program Requirements                                                                                                                                            |            |                                                         |          |                      |  |          |

| NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS FACULTY |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|---------|-----------|--------|--------|-------------------|------|-------|
| COMPUTER ENGINEERING DEPARTMENT                                        |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
| COURSE SYLLABUS                                                        |                                            |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
| Course Code:<br>AII302                                                 | Course Name:OPERATING SYSTEMS              |                                                                                                                                                                 |                    | Course Status:<br>COMPULSORY |         | Credits:3 |        | ECTS:6 |                   |      |       |
| Course Language:<br>ENGLISH                                            | Type of Course:FACE TO FACE                |                                                                                                                                                                 | Prerequisite: NONE |                              | Year: 3 |           | Term:5 |        | Continuation: %70 |      |       |
| Weekly Class Hours                                                     | Class time                                 | Laboratory                                                                                                                                                      | Application        | Learning Sessions            |         |           |        |        |                   |      |       |
|                                                                        | 3                                          | 0                                                                                                                                                               | .0                 | *PS                          | *KR     | *R        | *I     |        |                   |      |       |
|                                                                        |                                            |                                                                                                                                                                 |                    | 3                            | 3       | 0         | 0      |        |                   |      |       |
| Learning Outcomes of the Course                                        | Upon completing this course, students will |                                                                                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO1                                       | Ability to understand and apply knowledge of mathematics, science, and engineering                                                                              |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO2                                       | An ability to analyze a problem, identify and define the computing requirements appropriate to its solution                                                     |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO3                                       | An ability to apply mathematical foundations, algorithmic principles, and computer engineering techniques in the modelling and design of computer-based systems |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO4                                       | An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social aspects         |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO5                                       | Planning and carrying out experiments, as well as to analyze and interpret data                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO6                                       | Ability to use the techniques, skills and modern engineering tools necessary for engineering practice                                                           |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO7                                       | An understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering                                     |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO8                                       | An ability to work productively in a multidisciplinary team, in particular to carry out projects involving computer engineering skills                          |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►LO9                                       | An ability to communicate effectively with a range of audiences                                                                                                 |                    |                              |         |           |        |        |                   |      |       |
|                                                                        | ►L10                                       | A recognition of the need for, and an ability to engage in life-long learning                                                                                   |                    |                              |         |           |        |        |                   |      |       |
| The Relationship Between Learning Outcomes and                         |                                            | PR** 1                                                                                                                                                          | PR 2               | PR 3                         | PR 4    | PR 5      | PR 6   | PR 7   | PR 8              | PR 9 | PR 10 |
|                                                                        | LO1                                        | 2                                                                                                                                                               | 2                  | 1                            | 1       | 2         | 2      | 1      | 1                 | 2    | 3     |

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                        |   |         |   |         |   |           |         |   |              |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---|---------|---|---------|---|-----------|---------|---|--------------|
| Program Competencies | LO 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2                                                                      | 1 | 1       | 1 | 3       | 2 | 2         | 1       | 1 | 2            |
|                      | LO 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4                                                                      | 2 | 1       | 1 | 1       | 1 | 1         | 1       | 2 | 1            |
|                      | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2                                                                      | 4 | 2       | 2 | 2       | 2 | 1         | 3       | 3 | 2            |
|                      | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4                                                                      | 2 | 2       | 2 | 2       | 1 | 1         | 4       | 2 | 2            |
|                      | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2                                                                      | 3 | 3       | 2 | 4       | 4 | 1         | 1       | 2 | 2            |
|                      | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                      | 2 | 1       | 3 | 3       | 1 | 2         | 2       | 2 | 1            |
|                      | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3                                                                      | 2 | 1       | 1 | 3       | 3 | 2         | 1       | 1 | 3            |
|                      | LO9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2                                                                      | 4 | 2       | 2 | 2       | 2 | 1         | 3       | 3 | 2            |
|                      | L10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4                                                                      | 2 | 2       | 2 | 2       | 1 | 1         | 4       | 2 | 2            |
|                      | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                        |   | 1: NONE |   | 2: Weak |   | 3: MIDDLE | 4: GOOD |   | 5: VERY GOOD |
| Course Description   | Study operating system principles, functions and operarions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                        |   |         |   |         |   |           |         |   |              |
| Course Objectives    | To explain/describe the identified concept(s).<br>To raise and develop awareness related to the relevant concept(s).<br>To discuss the validity of the identified concept(s).<br>To develop the selected/determined skills.<br>To examine the selected topics in depth/in detail.<br>To enhance students’ existing knowledge regarding the identified concepts/theories/topics.<br>To develop students’ ideas/knowledge/understanding within the context of the selected concepts.<br>To refresh students’ existing knowledge regarding the identified concepts/theories/topics.<br>To encourage innovation.<br>To develop critical thinking<br>By examining other approaches, to ensure that students gain knowledge about educational policies, structures, and practices on a global scale. |                                                                        |   |         |   |         |   |           |         |   |              |
| Textbook / Resources | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Understanding Operating Systems. By: Ida M. Flynn & Ann McIver McHoles |   |         |   |         |   |           |         |   |              |
|                      | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Modern Operating Systems. By: Andrew S. Tenenbaum                      |   |         |   |         |   |           |         |   |              |
|                      | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                        |   |         |   |         |   |           |         |   |              |
|                      | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                        |   |         |   |         |   |           |         |   |              |

|                                |                                                                                                                                                                                                                                                                                                                                                             |                                   |                |            |                                          |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------|------------|------------------------------------------|
|                                | 5                                                                                                                                                                                                                                                                                                                                                           |                                   |                |            |                                          |
| Teaching Methods of the Course | Lectures, Problem Solving.Question-Answer                                                                                                                                                                                                                                                                                                                   |                                   |                |            |                                          |
| Course Content                 | Course description: Principles of operating systems. Memory management. Multiprocessing. Virtual memory concepts. Memory protection. Scheduling. Process management. Time-slicing and priorities, deadlocks and process synchronization. Peripheral control. Filing system management. Resource control and monitoring. Linux and Windows Operating Systems |                                   |                |            |                                          |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                                                                        | Subject                           |                | Activities | Source                                   |
|                                | 1                                                                                                                                                                                                                                                                                                                                                           | Introduction to Operating Systems |                | KR         | 1&2                                      |
|                                | 2                                                                                                                                                                                                                                                                                                                                                           | Computer Systems/OS Structures    |                | KR         | 1&2                                      |
|                                | 3                                                                                                                                                                                                                                                                                                                                                           | Process Management and Threads    |                | KR         | 1&2                                      |
|                                | 4                                                                                                                                                                                                                                                                                                                                                           | CPU Scheduling                    |                | KR, PS     | 1&2                                      |
|                                | 5                                                                                                                                                                                                                                                                                                                                                           | CPU Scheduling continued          |                | KR, PS     | 1&2                                      |
|                                | 6                                                                                                                                                                                                                                                                                                                                                           | Process Synchronization           |                | KR, PS     | 1&2                                      |
|                                | 7                                                                                                                                                                                                                                                                                                                                                           | Examination (Mid term)            |                | KR, PS     | 1&2                                      |
|                                | 8                                                                                                                                                                                                                                                                                                                                                           | Deadlocks                         |                | KR         | 1&2                                      |
|                                | 9                                                                                                                                                                                                                                                                                                                                                           | Memory Management                 |                | KR, PS     | 1&2                                      |
|                                | 10                                                                                                                                                                                                                                                                                                                                                          | Virtual Memory                    |                | PS         | 1&2                                      |
|                                | 11                                                                                                                                                                                                                                                                                                                                                          | File-System Interface             |                | PS         | 1&2                                      |
|                                | 12                                                                                                                                                                                                                                                                                                                                                          | I/O Systems                       |                | PS         | 1&2                                      |
|                                | 13                                                                                                                                                                                                                                                                                                                                                          | Windows & Unix O.S.               |                | PS         | 1&2                                      |
|                                | 14                                                                                                                                                                                                                                                                                                                                                          | Examination (Final)               |                | PS         | 1&2                                      |
| Evaluation Criteria            | Method                                                                                                                                                                                                                                                                                                                                                      |                                   | Contribution % | Source     | Relevant Qualifications                  |
|                                | 1                                                                                                                                                                                                                                                                                                                                                           | Midterm Exam                      | 40             | 1&2        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                | 2                                                                                                                                                                                                                                                                                                                                                           | Final Exam                        | 50             | 1&2        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                | 3                                                                                                                                                                                                                                                                                                                                                           | Quiz                              | 10             | 1&2        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                | 4                                                                                                                                                                                                                                                                                                                                                           |                                   |                |            |                                          |
|                                | 5                                                                                                                                                                                                                                                                                                                                                           |                                   |                |            |                                          |
|                                | 6                                                                                                                                                                                                                                                                                                                                                           |                                   |                |            |                                          |

|                                                                                                                                      |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|------------------------------------------------------|----------|--------------------------|---------------|--|--|--|--|-----|
| Limitations on the Use of Artificial Intelligence                                                                                    | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
|                                                                                                                                      | *        |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Learning Program                                                                                                                     |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                                     | Quantity | Student Workload (Hours) |               |  |  |  |  |     |
| Course Hours                                                                                                                         | 14       | 14x3                     | 42 | Knowledge Reinforcement and Problem Solving Sessions | 7        | 4x7                      | 28            |  |  |  |  |     |
| Preparation for the Course:                                                                                                          | 14       | 14x3                     | 42 |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 1                                                                                                                   | 1        | 1x4                      | 4  |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 2                                                                                                                   |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| Research Project 3                                                                                                                   |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |
| In-Class Discussion/Practice                                                                                                         | 2        | 2x6                      | 12 |                                                      |          |                          |               |  |  |  |  |     |
| Preparation for Activities                                                                                                           | 2        | 2x24                     | 48 |                                                      |          |                          |               |  |  |  |  |     |
| Total Workload                                                                                                                       |          | 176                      |    | Estimated ECTS Credit (Total Workload/ 30) :         |          | 5.866667                 | Approximately |  |  |  |  | 5.9 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                                      |          |                          |               |  |  |  |  |     |

\*\* Program Requirements



|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                    |                   |  |               |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|---------------|
|                                       | networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                    |                   |  |               |
| <b>Course Objectives</b>              | At the end of the course, the students will be able to:<br><br>1. Build an understanding of the fundamental concepts of computer networking.<br>2. Familiarize the student with the basic taxonomy and terminology of the computer Networking area.<br>3. Introduce the student to advanced networking concepts, preparing the student for Entry Advanced courses in computer networking.<br>4. Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks. |                                                                                                                                    |                   |  |               |
| <b>Textbook / Resources</b>           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lecture Notes                                                                                                                      |                   |  |               |
|                                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data Communications and Networking. Fourth Edition, Behrouz A.Forouzan                                                             |                   |  |               |
|                                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Networking, Second Edition, Jeffery S.Beasley                                                                                      |                   |  |               |
|                                       | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                    |                   |  |               |
|                                       | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                    |                   |  |               |
| <b>Teaching Methods of the Course</b> | Problem-Solving Method, Expository Teaching Method, and Discovery Learning Method.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                    |                   |  |               |
| <b>Course Content</b>                 | The content of data communications and networking covers the transmission of data between devices, including its five key components: the message, sender, receiver, transmission medium, and protocols. It also includes the study of layered communication models, network hardware (like routers and switches), and software protocols (such as TCP/IP and HTTP) that enable devices to exchange data reliably.                                                                                                                  |                                                                                                                                    |                   |  |               |
| <b>Topics to be Covered Each Week</b> | <b>Week</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Subject</b>                                                                                                                     | <b>Activities</b> |  | <b>Source</b> |
|                                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The Network as Platform                                                                                                            |                   |  |               |
|                                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The Element of a Networks                                                                                                          | I                 |  | 1,2&3         |
|                                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The Architectures of the internet, A Fault Tolerant Network Architecture, Providing Quality of Service, Providing Network Security | I                 |  | 1,2&3         |
|                                       | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The Platform for Communication.                                                                                                    | I                 |  | 1,2&3         |
|                                       | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The Elements of Communication, Communicating the Message, Components of the Network                                                | KR                |  | 1,2&3         |
|                                       | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | End Devices and their Role on the Network, Intermediary Devices and their Role on the Network                                      | KR                |  | 1,2&3         |



| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                 | Quantity                                     | Student Workload (Hours) |          |               |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|----------------------------------|----------------------------------------------|--------------------------|----------|---------------|--|---|
| Course Hours                                                                                                                         | 14       | 14x3                     | 42 | Problem Solving Sessions         | 6                                            | 6x3                      | 18       |               |  |   |
| Preparation for Quiz                                                                                                                 | 1        | 1x4                      | 4  | Knowledge Reinforcement Sessions | 4                                            | 4x3                      | 12       |               |  |   |
| Quiz                                                                                                                                 | 1        | 1x2                      | 2  | Instructor-led Sessions          | 4                                            | 4x3                      | 12       |               |  |   |
| Preparation for the Final Exam                                                                                                       | 1        | 1x8                      | 8  |                                  |                                              |                          |          |               |  |   |
| Final Exam                                                                                                                           | 1        | 1x2                      | 2  |                                  |                                              |                          |          |               |  |   |
|                                                                                                                                      |          |                          |    |                                  |                                              |                          |          |               |  |   |
| Total Workload                                                                                                                       |          | 100                      |    |                                  | Estimated ECTS Credit (Total Workload/ 30) : |                          | 3.333333 | Approximately |  | 3 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                  |                                              |                          |          |               |  |   |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS        |                                                           |                                                                                                                                     |                 |                   |                              |         |           |        |        |                      |       |
|---------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|------------------------------|---------|-----------|--------|--------|----------------------|-------|
| DEPARTMENT OF COMPUTER ENGINEERING                                              |                                                           |                                                                                                                                     |                 |                   |                              |         |           |        |        |                      |       |
| COURSE SYLLABUS                                                                 |                                                           |                                                                                                                                     |                 |                   |                              |         |           |        |        |                      |       |
| Course Code:<br>AII303                                                          | Course Name: DATA COMMUNICATIONS<br>AND COMPUTER NETWORKS |                                                                                                                                     |                 |                   | Course Status:<br>Compulsory |         | Credits:4 |        | ECTS:5 |                      |       |
| Course Language:<br>ENGLISH                                                     | Type of Course:DISTANCE                                   |                                                                                                                                     |                 | Prerequisite: -   |                              | Year: 3 |           | Term:5 |        | Continuation:<br>%70 |       |
| Weekly Class Hours                                                              | Class<br>time                                             | Laboratory                                                                                                                          | Applica<br>tion | Learning Sessions |                              |         |           |        |        |                      |       |
|                                                                                 | 4                                                         | 1                                                                                                                                   | 3               | *PS               |                              | *KR     |           | *R     |        | *I                   |       |
|                                                                                 |                                                           |                                                                                                                                     |                 | 4                 |                              | 4       |           | 0      |        | 3                    |       |
| Learning Outcomes of<br>the Course                                              | Upon completing this course, students will                |                                                                                                                                     |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO1                                                      | Independently understand basic computer network technology.                                                                         |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO2                                                      | Understand and explain Data Communications System and its components.                                                               |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO3                                                      | Identify the different types of network topologies and protocols.                                                                   |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO4                                                      | Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.                                            |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO5                                                      | Identify the different types of network devices and their functions within a network                                                |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO6                                                      | Understand and building the skills of subletting and routing mechanisms.                                                            |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO7                                                      | Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation. |                 |                   |                              |         |           |        |        |                      |       |
|                                                                                 | ►LO8                                                      |                                                                                                                                     |                 |                   |                              |         |           |        |        |                      |       |
| The Relationship<br>Between Learning<br>Outcomes and<br>Program<br>Competencies |                                                           | PR** 1                                                                                                                              | PR 2            | PR 3              | PR 4                         | PR 5    | PR 6      | PR 7   | PR 8   | PR 9                 | PR 10 |
|                                                                                 | LO1                                                       | 5                                                                                                                                   | 4               | 4                 | 2                            | 1       | 2         | 3      | 1      | 3                    | 1     |
|                                                                                 | LO 2                                                      | 5                                                                                                                                   | 5               | 4                 | 3                            | 2       | 3         | 3      | 3      | 3                    | 2     |
|                                                                                 | LO 3                                                      | 4                                                                                                                                   | 4               | 4                 | 5                            | 3       | 3         | 3      | 3      | 3                    | 1     |



|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                          |                       |                   |                                          |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------|------------------------------------------|
| <b>Course Content</b>                 | The content of data communications and networking covers the transmission of data between devices, including its five key components: the message, sender, receiver, transmission medium, and protocols. It also includes the study of layered communication models, network hardware (like routers and switches), and software protocols (such as TCP/IP and HTTP) that enable devices to exchange data reliably. |                                                                                                                                                                          |                       |                   |                                          |
| <b>Topics to be Covered Each Week</b> | <b>Week</b>                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Subject</b>                                                                                                                                                           |                       | <b>Activities</b> | <b>Source</b>                            |
|                                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                  | The Network as Platform                                                                                                                                                  |                       |                   |                                          |
|                                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                  | The Element of a Networks                                                                                                                                                |                       | I                 | 1,2&3                                    |
|                                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                  | The Architectures of the internet, A Fault Tolerant Network Architecture, Providing Quality of Service, Providing Network Security                                       |                       | I                 | 1,2&3                                    |
|                                       | 4                                                                                                                                                                                                                                                                                                                                                                                                                  | The Platform for Communication.                                                                                                                                          |                       | I                 | 1,2&3                                    |
|                                       | 5                                                                                                                                                                                                                                                                                                                                                                                                                  | The Elements of Communication, Communicating the Message, Components of the Network                                                                                      |                       | KR                | 1,2&3                                    |
|                                       | 6                                                                                                                                                                                                                                                                                                                                                                                                                  | End Devices and their Role on the Network, Intermediary Devices and their Role on the Network                                                                            |                       | KR                | 1,2&3                                    |
|                                       | 7                                                                                                                                                                                                                                                                                                                                                                                                                  | Network Media                                                                                                                                                            |                       | PS                | 1,2&3                                    |
|                                       | 8                                                                                                                                                                                                                                                                                                                                                                                                                  | LANs, WANs, and Internet works                                                                                                                                           |                       | KR                | 1,2&3                                    |
|                                       | 9                                                                                                                                                                                                                                                                                                                                                                                                                  | Local Area Networks, Wide Area Networks, The Internet – A Network of Networks ,Network presentations                                                                     |                       | KR                | 1,2&3                                    |
|                                       | 10                                                                                                                                                                                                                                                                                                                                                                                                                 | Protocols, Rules That Govern Communications, Network Protocols                                                                                                           |                       | PS                | 1,2&3                                    |
|                                       | 11                                                                                                                                                                                                                                                                                                                                                                                                                 | Protocol Suites and Industry Standards, The Interaction of Protocols, Technology Independent Protocols,                                                                  |                       | PS                | 1,2&3                                    |
|                                       | 12                                                                                                                                                                                                                                                                                                                                                                                                                 | Using Layered Models, The Benefits of Using of Layered Model, Protocol and Reference Models, The TCP/IP Model, The Communication Process                                 |                       | PS                | 1,2&3                                    |
|                                       | 13                                                                                                                                                                                                                                                                                                                                                                                                                 | Network Addressing, Addressing in the Network, Getting the Data to the End Device, Getting the Data through the Internet work, Getting the Data to the Right Application |                       | PS                | 1,2&3                                    |
|                                       | 14                                                                                                                                                                                                                                                                                                                                                                                                                 | Planning and Cabling Networks, LANs Making the Physical Connection                                                                                                       |                       | PS                | 1,2&3                                    |
| <b>Evaluation Criteria</b>            | <b>Method</b>                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                          | <b>Contribution %</b> | <b>Source</b>     | <b>Relevant Qualifications</b>           |
|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                    | Final Exam                                                                                                                                                               | 50                    | 1,2&3             | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |

|                                                                                                                                      |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------|----------------------------------------------|--------------------------|----------|---------------|---|
|                                                                                                                                      |          | Quiz                                                                                                                                                | 20 | 1,2&3                            | PR1,PR2,PR3,PR4,PR5,PR7,PR8                  |                          |          |               |   |
|                                                                                                                                      |          | Midterm                                                                                                                                             | 30 | 1,2&3                            | PR1,PR2,PR3,PR4,PR5,PR7,PR8,R10              |                          |          |               |   |
|                                                                                                                                      |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | The use of GenAI tools in exams and clearly designated individual assignments is strictly forbidden and will be treated as academic dishonesty.     |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | Presenting text or code generated by GenAI as your own work without proper attribution constitutes plagiarism                                       |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | In all permissible instances, you are required to clearly state the purpose and extent of GenAI usage within your submission.                       |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | All text and code derived from GenAI tools must be properly cited using an appropriate academic referencing style.                                  |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | The student bears the sole responsibility for verifying the accuracy and currency of any information (text, code, or data) produced by GenAI tools. |    |                                  |                                              |                          |          |               |   |
| Learning Program                                                                                                                     |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                                                                            |    | Educational Tool                 | Quantity                                     | Student Workload (Hours) |          |               |   |
| Course Hours                                                                                                                         | 14       | 14x3                                                                                                                                                | 42 | Problem Solving Sessions         | 6                                            | 6x3                      | 18       |               |   |
| Preparation for Quiz                                                                                                                 | 1        | 1x4                                                                                                                                                 | 4  | Knowledge Reinforcement Sessions | 4                                            | 4x3                      | 12       |               |   |
| Quiz                                                                                                                                 | 1        | 1x2                                                                                                                                                 | 2  | Instructor-led Sessions          | 4                                            | 4x3                      | 12       |               |   |
| Preparation for the Final Exam                                                                                                       | 1        | 1x8                                                                                                                                                 | 8  |                                  |                                              |                          |          |               |   |
| Final Exam                                                                                                                           | 1        | 1x2                                                                                                                                                 | 2  |                                  |                                              |                          |          |               |   |
|                                                                                                                                      |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
| Total Workload                                                                                                                       |          | 100                                                                                                                                                 |    |                                  | Estimated ECTS Credit (Total Workload/ 30) : |                          | 3.333333 | Approximately | 3 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - ARTIFICIAL INTELLIGENCE AND INFORMATICS       |                                            |                                                                                                                       |             |                      |                              |         |           |        |        |                   |       |
|---------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------|----------------------|------------------------------|---------|-----------|--------|--------|-------------------|-------|
| COORDINATION OF COMMON COURSES                                      |                                            |                                                                                                                       |             |                      |                              |         |           |        |        |                   |       |
| COURSE SYLLABUS                                                     |                                            |                                                                                                                       |             |                      |                              |         |           |        |        |                   |       |
| Course Code: COM 333                                                | Course Name:Operations Research            |                                                                                                                       |             |                      | Course Status:<br>COMPULSORY |         | Credits:3 |        | ECTS:5 |                   |       |
| Course Language: ENGLISH                                            | Type of Course:FACE-To-FACE                |                                                                                                                       |             | Prerequisite: MTH112 |                              | Year: 3 |           | Term:6 |        | Continuation: %70 |       |
| Weekly Class Hours                                                  | Class time                                 | Laboratory                                                                                                            | Application | Learning Sessions    |                              |         |           |        |        |                   |       |
|                                                                     | 3                                          | 1                                                                                                                     | .0          | *PS                  |                              | *KR     |           | *R     |        | *I                |       |
|                                                                     |                                            |                                                                                                                       |             | 3                    |                              | 4       |           | 0      |        | 0                 |       |
| Learning Outcomes of the Course                                     | Upon completing this course, students will |                                                                                                                       |             |                      |                              |         |           |        |        |                   |       |
|                                                                     | LO1                                        | Students will acquire knowledge sufficient to use the deterministic O.R techniques, primarily the linear programming. |             |                      |                              |         |           |        |        |                   |       |
|                                                                     | LO2                                        | Students will be able to develop an appropriate model from a verbal description of a problem.                         |             |                      |                              |         |           |        |        |                   |       |
|                                                                     | LO3                                        | Students will be able to study simpleks method and solve the linear programming problem.                              |             |                      |                              |         |           |        |        |                   |       |
|                                                                     | LO4                                        | Students will be able to choose a solution technique and solve engineering problems.                                  |             |                      |                              |         |           |        |        |                   |       |
|                                                                     | LO5                                        | Students will be able to interpret relevant information from a model and/or a solution and interpret it.              |             |                      |                              |         |           |        |        |                   |       |
|                                                                     | LO6                                        | Students will be able to understand and exercise professional and ethical norms.                                      |             |                      |                              |         |           |        |        |                   |       |
|                                                                     | LO7                                        | A recognition of the need for, and an ability to engage in life-long learning                                         |             |                      |                              |         |           |        |        |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies |                                            | PR** 1                                                                                                                | PR 2        | PR 3                 | PR 4                         | PR 5    | PR 6      | PR 7   | PR 8   | PR 9              | PR 10 |
|                                                                     | LO1                                        | 4                                                                                                                     | 5           | 5                    | 3                            | 3       | 3         | 2      | 1      | 2                 | 3     |
|                                                                     | LO 2                                       | 5                                                                                                                     | 5           | 5                    | 4                            | 3       | 4         | 2      | 2      | 1                 | 1     |
|                                                                     | LO 3                                       | 5                                                                                                                     | 5           | 5                    | 5                            | 4       | 5         | 1      | 2      | 2                 | 1     |
|                                                                     | LO 4                                       | 5                                                                                                                     | 5           | 5                    | 4                            | 4       | 4         | 1      | 3      | 3                 | 2     |
|                                                                     | LO 5                                       | 5                                                                                                                     | 4           | 3                    | 3                            | 3       | 3         | 1      | 1      | 1                 | 2     |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                 |   |         |   |         |            |           |         |        |              |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---|---------|---|---------|------------|-----------|---------|--------|--------------|
|                                | LO6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2                                                                                                               | 2 | 3       | 3 | 3       | 3          | 1         | 3       | 2      | 2            |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3                                                                                                               | 3 | 3       | 3 | 3       | 3          | 2         | 2       | 2      | 3            |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                 |   | 1: NONE |   | 2: Weak |            | 3: MIDDLE | 4: GOOD |        | 5: VERY GOOD |
| Course Description             | Historical Development of Operations Research.Modeling, Basic Concepts, Linear Programming, Graphical solution, Simplex Methods. Duality and sensitivity analysis.Transportation, assignment, and transshipment problems. Integer Programming. Mixed Integer Programming.                                                                                                                                                                                                                                                             |                                                                                                                 |   |         |   |         |            |           |         |        |              |
| Course Objectives              | <ul style="list-style-type: none"><li>• Teaching the basic of Operations Research</li><li>• To understand mathematical descriptions and representations of optimization problems</li><li>• To develop a model and solve real-life problems using linear programming techniques</li><li>• To analyze resultsof the obtained models.</li><li>• To study and solve transportation, transhipment and assignment problem.</li><li>• To develop Integer progeamming model.</li><li>• To use software to solve a variety of models</li></ul> |                                                                                                                 |   |         |   |         |            |           |         |        |              |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | F.S.Hiller, G.J.Lieberman. Introduction to operations research. 9th edition, McGraw-Hill Higher Education, 2016 |   |         |   |         |            |           |         |        |              |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Hamdy A. Taha.Operations Research: An Introduction (9th Edition) 9th Edition.Prentice Hall, 2007                |   |         |   |         |            |           |         |        |              |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Wayne L. Winston, Operations Research, 4th ed., Thomson, 2004.                                                  |   |         |   |         |            |           |         |        |              |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                 |   |         |   |         |            |           |         |        |              |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                 |   |         |   |         |            |           |         |        |              |
| Teaching Methods of the Course | Discussion Method, Problem Solving Method, Laboratory, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                 |   |         |   |         |            |           |         |        |              |
| Course Content                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                 |   |         |   |         |            |           |         |        |              |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Subject                                                                                                         |   |         |   |         | Activities |           |         | Source |              |
|                                | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Introduction to OR                                                                                              |   |         |   |         | KR         |           | 1&2     |        |              |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | A review of basic linear models. Basic Concepts                                                                 |   |         |   |         | KR         |           | 1&2     |        |              |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Linear Programming                                                                                              |   |         |   |         | KR, PS     |           | 1&2     |        |              |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | The Graphical method                                                                                            |   |         |   |         | KR, PS     |           | 1&2     |        |              |

|                                                          |               |                                                                                            |                       |               |                                          |
|----------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------|-----------------------|---------------|------------------------------------------|
|                                                          | 5             | The Simplex algorithm                                                                      |                       | KR, PS        | 1&2                                      |
|                                                          | 6             | The Simplex algorithm                                                                      |                       | KR, PS        | 1&2                                      |
|                                                          | 7             | The Big M Method                                                                           |                       | KR, PS        | 1&2                                      |
|                                                          | 8             | Midterm Exam                                                                               |                       | KR, PS        | 1&2                                      |
|                                                          | 9             | Sensitivity analysis                                                                       |                       | KR, PS        | 1&2                                      |
|                                                          | 10            | Duality                                                                                    |                       | KR, PS        | 1&2                                      |
|                                                          | 11            | Transportation problems                                                                    |                       | KR, PS        | 1&2                                      |
|                                                          | 12            | Transportation, Transshipment problems                                                     |                       | KR, PS        | 1&2                                      |
|                                                          | 13            | Assignment problem                                                                         |                       | KR, PS        | 1&2                                      |
|                                                          | 14            | Integer Programming. Mixed Integer programming                                             |                       | KR, PS        | 1&2                                      |
|                                                          | 15            | Review                                                                                     |                       | PS            | 1&2                                      |
|                                                          | 16            | Final Exam                                                                                 |                       | KR, PS        | 1&2                                      |
| <b>Evaluation Criteria</b>                               | <b>Method</b> |                                                                                            | <b>Contribution %</b> | <b>Source</b> | <b>Relevant Qualifications</b>           |
|                                                          | 1             | Attendance                                                                                 | 10                    |               |                                          |
|                                                          | 2             | Assignment                                                                                 | 10                    | 1&2           | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                                          | 3             | Laboratory                                                                                 | 10                    | 1&2           | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                                          | 4             | Project                                                                                    |                       |               |                                          |
|                                                          | 5             | Midterm Exam                                                                               | 30                    | 1&2           | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                                          | 6             | Final Exam                                                                                 | 40                    | 1&2           | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
| <b>Limitations on the Use of Artificial Intelligence</b> | *             | Paragrapht 1-2 can be used to have information about Operation Research.                   |                       |               |                                          |
|                                                          | *             | Artificial Intelligence should not be used in gathering information for research purposes. |                       |               |                                          |

|                                                                                                                                      |          |                          |    |                                              |          |                          |               |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|----------------------------------------------|----------|--------------------------|---------------|--|---|
|                                                                                                                                      | *        |                          |    |                                              |          |                          |               |  |   |
|                                                                                                                                      | *        |                          |    |                                              |          |                          |               |  |   |
|                                                                                                                                      | *        |                          |    |                                              |          |                          |               |  |   |
| Learning Program                                                                                                                     |          |                          |    |                                              |          |                          |               |  |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                             | Quantity | Student Workload (Hours) |               |  |   |
| Course Hours                                                                                                                         | 16       | 16x3                     | 48 |                                              |          |                          |               |  |   |
| Labs and Tutorials                                                                                                                   | 5        | 5x2                      | 10 |                                              |          |                          |               |  |   |
| Assignment                                                                                                                           | 5        | 5x3                      | 15 |                                              |          |                          |               |  |   |
| Project/Presentation/Report                                                                                                          |          |                          |    |                                              |          |                          |               |  |   |
| Quizzes                                                                                                                              |          |                          |    |                                              |          |                          |               |  |   |
| Selfstudy                                                                                                                            | 1        | 14x2                     | 28 |                                              |          |                          |               |  |   |
| Midterm Examination Study                                                                                                            | 1        | 1x22                     | 22 |                                              |          |                          |               |  |   |
| Final Examination Study                                                                                                              | 1        | 1x26                     | 26 |                                              |          |                          |               |  |   |
| Total Workload                                                                                                                       |          | 149                      |    | Estimated ECTS Credit (Total Workload/ 30) : |          | 4.966667                 | Approximately |  | 5 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                              |          |                          |               |  |   |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY NAME                                  |                                            |                                                                                                                                              |             |                              |                           |                 |      |           |           |        |                   |
|---------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------|---------------------------|-----------------|------|-----------|-----------|--------|-------------------|
| DEPARTMENT NAME                                                     |                                            |                                                                                                                                              |             |                              |                           |                 |      |           |           |        |                   |
| COURSE SYLLABUS                                                     |                                            |                                                                                                                                              |             |                              |                           |                 |      |           |           |        |                   |
| Course Code: COM339                                                 | Course Name:Programming Language Concepts  |                                                                                                                                              |             |                              | Course Status: Compulsary |                 |      | Credits:3 |           | ECTS:5 |                   |
| Course Language: English                                            | Type of Course:3rd year BSc program        |                                                                                                                                              |             | Prerequisite: AII106, AII102 |                           | Year: 2025-2026 |      |           | Term:FALL |        | Continuation: %70 |
| Weekly Class Hours                                                  | Class time                                 | Laboratory                                                                                                                                   | Application | Learning Sessions            |                           |                 |      |           |           |        |                   |
|                                                                     | 3                                          |                                                                                                                                              | 1           | *PS                          |                           | *KR             |      | *R        |           | *I     |                   |
|                                                                     |                                            |                                                                                                                                              |             | 3                            |                           | 4               |      |           |           |        |                   |
| Learning Outcomes of the Course                                     | Upon completing this course, students will |                                                                                                                                              |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 1                                      | Use of evaluation criteria for an assessment of programming language                                                                         |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 2                                      | Make derivation and draw parse tree for programs written in a language given its context free grammar                                        |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 3                                      | Demonstrate and reconstruct a specific grammar to avoid an ambiguity                                                                         |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 4                                      | Apply static and dynamic semantics of the language for a verification of the program                                                         |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 5                                      | Analyse variables’ life time and scope (static or dynamic)                                                                                   |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 6                                      | Examine different concepts implemented in programming languages (data types, control structures, procedural and object-oriented programming) |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 7                                      | Compare imperative and declarative paradigms of programming languages                                                                        |             |                              |                           |                 |      |           |           |        |                   |
|                                                                     | ►LO 8                                      | Ability to program in procedural and object-oriented programming language                                                                    |             |                              |                           |                 |      |           |           |        |                   |
| The Relationship Between Learning Outcomes and Program Competencies |                                            | PR** 1                                                                                                                                       | PR 2        | PR 3                         | PR 4                      | PR 5            | PR 6 | PR 7      | PR 8      | PR 9   | PR 10             |
|                                                                     | LO1                                        | 4                                                                                                                                            | 4           | 4                            | 3                         | 2               | 3    | 2         | 1         | 2      | 3                 |
|                                                                     | LO 2                                       | 5                                                                                                                                            | 4           | 5                            | 4                         | 3               | 4    | 2         | 2         | 1      | 1                 |
|                                                                     | LO 3                                       | 4                                                                                                                                            | 5           | 4                            | 5                         | 4               | 5    | 1         | 2         | 2      | 1                 |

|                                |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                      |         |   |         |   |            |         |        |              |
|--------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|---|---------|---|------------|---------|--------|--------------|
|                                | LO 4               | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4                                                                                    | 4       | 4 | 4       | 4 | 1          | 3       | 3      | 2            |
|                                | LO 5               | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4                                                                                    | 3       | 3 | 3       | 3 | 1          | 1       | 1      | 2            |
|                                | LO 6               | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3                                                                                    | 4       | 3 | 5       | 3 | 2          | 1       | 2      | 2            |
|                                | LO7                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3                                                                                    | 4       | 3 | 3       | 3 | 1          | 3       | 2      | 2            |
|                                | LO8                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4                                                                                    | 5       | 5 | 4       | 5 | 2          | 2       | 1      | 3            |
|                                | Contribution Level |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                      | 1: NONE |   | 2: Weak |   | 3: MIDDLE  | 4: GOOD |        | 5: VERY GOOD |
| Course Description             |                    | Classification of programming languages. Syntactic and semantic description of programming languages. Imperative programming languages: data objects, data types, control structures, sub-programs, principles of implementation. Procedural programming languages. Object-oriented programming languages. Declarative programming languages: logic programming, functional programming, structure-query language programming.                                                                                                                                                                                         |                                                                                      |         |   |         |   |            |         |        |              |
| Course Objectives              |                    | <ul style="list-style-type: none"><li>• To provide a student with the necessary tools for the critical evaluation of existing and future programming languages</li><li>• To investigate the imperative and declarative paradigms and languages</li><li>• To teach the concepts and principles of constructions of different programming languages</li><li>• To assess of a programming language as a tool for software construction, enable a student to evaluate and choose a language to match the problem</li><li>• To study a declarative paradigm by teaching fundamentals of Lisp programming language</li></ul> |                                                                                      |         |   |         |   |            |         |        |              |
| Textbook / Resources           |                    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Robert W. Sebesta, Concepts of Programming Languages, 8th ed., Addison-Wesley, 2008. |         |   |         |   |            |         |        |              |
|                                |                    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | David A. Watt, Programming Language Design Concepts, John Wiley & Sons, 2004.        |         |   |         |   |            |         |        |              |
|                                |                    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Kenneth C. Louden, Programming Languages. Principles and Practice, Thomson, 2003     |         |   |         |   |            |         |        |              |
|                                |                    | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                      |         |   |         |   |            |         |        |              |
|                                |                    | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                      |         |   |         |   |            |         |        |              |
| Teaching Methods of the Course |                    | Discussion Method, Problem Solving Method, Laboratory, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                      |         |   |         |   |            |         |        |              |
| Course Content                 |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                      |         |   |         |   |            |         |        |              |
| Topics to be Covered Each Week |                    | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Subject                                                                              |         |   |         |   | Activities |         | Source |              |
|                                |                    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Introduction. Programming Language’s Evaluation Criteria.                            |         |   |         |   | KR         |         | 1      |              |
|                                |                    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Context free grammars. Derivation of program.                                        |         |   |         |   | KR, PS     |         | 1&2    |              |
|                                |                    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Compiler, Interpreter, Lexical and Syntax Analyzer,                                  |         |   |         |   | KR, PS     |         | 1&2    |              |
|                                |                    | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | BNF diagrams                                                                         |         |   |         |   | KR, PS     |         | 1&2    |              |

|                                                   |        |                                                                                            |                |        |                                          |       |
|---------------------------------------------------|--------|--------------------------------------------------------------------------------------------|----------------|--------|------------------------------------------|-------|
|                                                   | 5      | Parse trees. Leftmost, Rightmost derivations                                               |                |        | KR, PS                                   | 1&2   |
|                                                   | 6      | Ambiguity. Reconstruction of grammar.                                                      |                |        |                                          |       |
|                                                   | 7      | Extended BNF grammar                                                                       |                |        | KR, PS                                   | 1&2   |
|                                                   | 8      | Visa Exam                                                                                  |                |        | KR, PS                                   | 1&2   |
|                                                   | 9      | Variables. Name, Life time, Scope. Static and dynamic binding.                             |                |        | KR, PS                                   | 1&2   |
|                                                   | 10     | Data types (Primitive, Arrays, Pointers, Records).                                         |                |        | KR, PS                                   | 1&2   |
|                                                   | 11     | Control structures. Procedural programming paradigm                                        |                |        | KR, PS                                   | 1&2   |
|                                                   | 12     | Object-oriented programming concept. Abstract data types                                   |                |        | KR, PS                                   | 1&2   |
|                                                   | 13     | Constructors, Inheritance                                                                  |                |        | KR, PS                                   | 1&2   |
|                                                   | 14     | Polymorphisim                                                                              |                |        | KR, PS                                   | 1&2   |
|                                                   | 15     | Functional Programming. Common Lisp.                                                       |                |        | KR, PS                                   | 1,2,3 |
|                                                   | 16     | Final Exam                                                                                 |                |        | KR, PS                                   | 1&2   |
| Evaluation Criteria                               | Method |                                                                                            | Contribution % | Source | Relevant Qualifications                  |       |
|                                                   | 1      | Attendance                                                                                 | 10             |        |                                          |       |
|                                                   | 2      | Assignment+Labs                                                                            | 20             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |       |
|                                                   | 3      | Midterm Exam                                                                               | 30             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |       |
|                                                   | 4      | Final Exam                                                                                 | 40             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |       |
|                                                   | 5      |                                                                                            |                |        |                                          |       |
|                                                   | 6      |                                                                                            |                |        |                                          |       |
| Limitations on the Use of Artificial Intelligence | *      | Paragrapht 1-2-3 can be usedto have information about Programming Language Concepts.       |                |        |                                          |       |
|                                                   | *      | Artificial Intelligence should not be used in gathering information for research purposes. |                |        |                                          |       |
|                                                   | *      |                                                                                            |                |        |                                          |       |
|                                                   | *      |                                                                                            |                |        |                                          |       |

|                                                                                                                                      |          |                          |    |                                              |          |                          |               |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|----------------------------------------------|----------|--------------------------|---------------|--|---|
|                                                                                                                                      | *        |                          |    |                                              |          |                          |               |  |   |
| Learning Program                                                                                                                     |          |                          |    |                                              |          |                          |               |  |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                             | Quantity | Student Workload (Hours) |               |  |   |
| Course duration in class                                                                                                             | 14       | 3                        | 42 |                                              |          |                          |               |  |   |
| Labs and Tutorials                                                                                                                   | 3        | 2                        | 6  |                                              |          |                          |               |  |   |
| Assignment                                                                                                                           | 5        | 3                        | 15 |                                              |          |                          |               |  |   |
| Project/Presentation/Report                                                                                                          |          |                          |    |                                              |          |                          |               |  |   |
| Midterm Examination                                                                                                                  | 1        | 22                       | 22 |                                              |          |                          |               |  |   |
| Final Examination                                                                                                                    | 1        | 28                       | 28 |                                              |          |                          |               |  |   |
| Self Study                                                                                                                           | 14       | 2.5                      | 35 |                                              |          |                          |               |  |   |
| Total Workload                                                                                                                       |          | 148                      |    | Estimated ECTS Credit (Total Workload/ 30) : |          | 4.933333                 | Approximately |  | 5 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                              |          |                          |               |  |   |

\*\* Program Requirements

**NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS**

**COORDINATION OF COMMON COURSES**

**COURSE SYLLABUS**

|                                 |                                                                     |                                                                                                                                                                                                                |             |                           |      |           |      |        |      |                   |      |
|---------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------|------|-----------|------|--------|------|-------------------|------|
| Course Code: COM 362            | Course Name:SIGNALS AND SYSTEMS FOR COMPUTER ENGINEERS              |                                                                                                                                                                                                                |             | Course Status: COMPULSORY |      | Credits:4 |      | ECTS:6 |      |                   |      |
| Course Language: ENGLISH        | Type of Course:FACE-To-FACE                                         |                                                                                                                                                                                                                |             | Prerequisite: MTH201      |      | Year: 3   |      | Term:5 |      | Continuation: %70 |      |
| Weekly Class Hours              | Class time                                                          | Laboratory                                                                                                                                                                                                     | Application | Learning Sessions         |      |           |      |        |      |                   |      |
|                                 | 3                                                                   | 1                                                                                                                                                                                                              | .0          | *PS                       | *KR  |           | *R   |        | *I   |                   |      |
|                                 |                                                                     |                                                                                                                                                                                                                |             | 3                         | 4    |           | 0    |        | 0    |                   |      |
| Learning Outcomes of the Course | Upon completing this course, students will                          |                                                                                                                                                                                                                |             |                           |      |           |      |        |      |                   |      |
|                                 | LO1                                                                 | Studying the properties and characteristics of continues time and discrete time signals. Classifying the signals according to energy, power, duration. Studying signal transformation operations.              |             |                           |      |           |      |        |      |                   |      |
|                                 | LO2                                                                 | Able to define, state and identify system properties of linearity, time (in)variance, causality, memory and stability.                                                                                         |             |                           |      |           |      |        |      |                   |      |
|                                 | LO3                                                                 | Able to formulate and solve differential equations describing linear, time invariant (LTI) systems. Ability to find impulse, step response of LTI System, to apply convolution                                 |             |                           |      |           |      |        |      |                   |      |
|                                 | LO4                                                                 | Able to use Laplace and Fourier Transforms for computing output of continuous-time LTIS, for analysis of continuous-time LTIS,.                                                                                |             |                           |      |           |      |        |      |                   |      |
|                                 | LO5                                                                 | Able to use z- Transform for computing output of discrete-time LTIS, for analysis of discrete-time LTIS                                                                                                        |             |                           |      |           |      |        |      |                   |      |
|                                 | LO6                                                                 | Ability to use the techniques, skills and modern engineering tools necessary for engineering practice. Using Matlab package develop different programs on analysis, construction of different type of signals. |             |                           |      |           |      |        |      |                   |      |
|                                 | LO7                                                                 | Understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering                                                                                       |             |                           |      |           |      |        |      |                   |      |
|                                 | LO8                                                                 | Solve problems find solutions of the systems in time domain, z-domain and frequency domain                                                                                                                     |             |                           |      |           |      |        |      |                   |      |
|                                 | LO9                                                                 | Ability to model linear time invariant systems using Matlab package                                                                                                                                            |             |                           |      |           |      |        |      |                   |      |
|                                 | LO10                                                                | A recognition of the need for, and an ability to engage in life-long learning                                                                                                                                  |             |                           |      |           |      |        |      |                   |      |
|                                 | The Relationship Between Learning Outcomes and Program Competencies |                                                                                                                                                                                                                | PR** 1      | PR 2                      | PR 3 | PR 4      | PR 5 | PR 6   | PR 7 | PR 8              | PR 9 |
| LO1                             |                                                                     | 4                                                                                                                                                                                                              | 5           | 5                         | 3    | 3         | 3    | 2      | 1    | 2                 | 3    |



| Course Content                 |        |                                                                                                                                 |                |            |                                          |        |
|--------------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------|----------------|------------|------------------------------------------|--------|
| Topics to be Covered Each Week | Week   | Subject                                                                                                                         |                | Activities |                                          | Source |
|                                | 1      | Introduction. Classification of signals.                                                                                        |                | KR         |                                          | 1&2    |
|                                | 2      | Continuous and discrete-time signals and systems. Basic signal modifications.                                                   |                | KR         |                                          | 1&2    |
|                                | 3      | Sampling. Sampling theorem. Sampling of Discrete time signals. Analog to digital conversion.                                    |                | KR, PS     |                                          | 1&2    |
|                                | 4      | Systems, Classification of systems. Memory, causal, stable, linear and time-invariant systems. Stochastic processes and noise.. |                | KR, PS     |                                          | 1&2    |
|                                | 5      | Linear time-invariant systems. Properties of continuous-time and discrete-time systems.                                         |                | KR, PS     |                                          | 1&2    |
|                                | 6      | Time domain analysis.Impulse response, Step response. Time domain analysis. Convolution.                                        |                | KR, PS     |                                          | 1&2    |
|                                | 7      | Difference equation. Block diagram of LTI systems. Discrete time systems. Transfer Function.                                    |                | KR, PS     |                                          | 1&2    |
|                                | 8      | Midterm Exam                                                                                                                    |                | KR, PS     |                                          | 1&2    |
|                                | 9      | Transformation of Signals. Laplace Transform                                                                                    |                | KR, PS     |                                          | 1&2    |
|                                | 10     | Z alanı analizi. Z dönüşümü. Z- dönüşümünün özellikleri.                                                                        |                | KR, PS     |                                          | 1&2    |
|                                | 11     | S-düzleminin z-düzlemiyle eşleştirilmesi. Ters Z dönüşümü.                                                                      |                | KR, PS     |                                          | 1&2    |
|                                | 12     | Z düzlemi, kutuplar ve sıfırlar. Kararlılık                                                                                     |                | KR, PS     |                                          | 1&2    |
|                                | 13     | Fourier series. Representation of signals by Fourier series. Discrete Fourier transform                                         |                | KR, PS     |                                          | 1&2    |
|                                | 14     | Discrete Fourier transform,Discrete Fourier transform, Filtering                                                                |                | KR, PS     |                                          | 1&2    |
|                                | 15     | Review                                                                                                                          |                | PS         |                                          | 1&2    |
|                                | 16     | Final Exam                                                                                                                      |                | KR, PS     |                                          | 1&2    |
| Evaluation Criteria            | Method |                                                                                                                                 | Contribution % | Source     | Relevant Qualifications                  |        |
|                                | 1      | Attendance                                                                                                                      | 10             |            |                                          |        |
|                                | 2      | Assignment                                                                                                                      | 10             | 1&2        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |        |

|                                                                                                                                      |          |                                                                                                    |    |                  |                                              |                          |          |               |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------|----|------------------|----------------------------------------------|--------------------------|----------|---------------|-----|
|                                                                                                                                      | 3        | Laboratory                                                                                         | 10 | 1&2              | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10     |                          |          |               |     |
|                                                                                                                                      | 4        | Project                                                                                            |    |                  |                                              |                          |          |               |     |
|                                                                                                                                      | 5        | Midterm Exam                                                                                       | 30 | 1&2              | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10     |                          |          |               |     |
|                                                                                                                                      | 6        | Final Exam                                                                                         | 40 | 1&2              | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10     |                          |          |               |     |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Paragrapht 1-2-3 can be used to have information about Signals and Systems for Computer Engineers. |    |                  |                                              |                          |          |               |     |
|                                                                                                                                      | *        | Artificial Intelligence should not be used in gathering information for research purposes.         |    |                  |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                                                                                                    |    |                  |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                                                                                                    |    |                  |                                              |                          |          |               |     |
|                                                                                                                                      | *        |                                                                                                    |    |                  |                                              |                          |          |               |     |
| Learning Program                                                                                                                     |          |                                                                                                    |    |                  |                                              |                          |          |               |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                           |    | Educational Tool | Quantity                                     | Student Workload (Hours) |          |               |     |
| Course Hours                                                                                                                         | 16       | 16x4                                                                                               | 64 |                  |                                              |                          |          |               |     |
| Labs and Tutorials                                                                                                                   | 6        | 6x2                                                                                                | 12 |                  |                                              |                          |          |               |     |
| Assignment                                                                                                                           | 4        | 4x3                                                                                                | 12 |                  |                                              |                          |          |               |     |
| Project/Presentation/Report                                                                                                          |          |                                                                                                    |    |                  |                                              |                          |          |               |     |
| Quizzes                                                                                                                              |          |                                                                                                    |    |                  |                                              |                          |          |               |     |
| Selfstudy                                                                                                                            | 1        | 16x2                                                                                               | 32 |                  |                                              |                          |          |               |     |
| Midterm Examination Study                                                                                                            | 5        | 1x26                                                                                               | 26 |                  |                                              |                          |          |               |     |
| Final Examination Study                                                                                                              | 6        | 1x30                                                                                               | 32 |                  |                                              |                          |          |               |     |
| Total Workload                                                                                                                       |          | 178                                                                                                |    |                  | Estimated ECTS Credit (Total Workload/ 30) : |                          | 5.933333 | Approximately | 5.9 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                    |    |                  |                                              |                          |          |               |     |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                            |                                                                                                                    |             |                   |                            |         |           |        |        |                   |       |
|--------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------|-------------------|----------------------------|---------|-----------|--------|--------|-------------------|-------|
| DEPARTMENT OF COMPUTER ENGINEERING                                       |                                            |                                                                                                                    |             |                   |                            |         |           |        |        |                   |       |
| COURSE SYLLABUS                                                          |                                            |                                                                                                                    |             |                   |                            |         |           |        |        |                   |       |
| Course Code: AIE341                                                      | Course Name: COMPUTER NETWORKS<br>DEASIGN  |                                                                                                                    |             |                   | Course Status:<br>ELECTIVE |         | Credits:3 |        | ECTS:3 |                   |       |
| Course Language: ENGLISH                                                 | Type of Course:DISTANCE                    |                                                                                                                    |             | Prerequisite: -   |                            | Year: 3 |           | Term:5 |        | Continuation: %70 |       |
| Weekly Class Hours                                                       | Class<br>time                              | Laboratory                                                                                                         | Application | Learning Sessions |                            |         |           |        |        |                   |       |
|                                                                          | 3                                          | 0                                                                                                                  | 0           | *PS               |                            | *KR     |           | *R     |        | *I                |       |
|                                                                          |                                            |                                                                                                                    |             | 3                 |                            | 3       |           | 0      |        | 3                 |       |
| Learning Outcomes of the Course                                          | Upon completing this course, students will |                                                                                                                    |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO1                                      | The ability to understand and apply network fundamentals like topologies and protocols,                            |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO2                                      | Design and implement network infrastructure (both wired and wireless)                                              |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO3                                      | Configure network hardware (routers, switches)                                                                     |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO4                                      | Troubleshoot network issues,                                                                                       |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO5                                      | Apply network security principles                                                                                  |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO6                                      | Students should also be able to analyze network performance and establish communication between different systems. |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO7                                      |                                                                                                                    |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO8                                      |                                                                                                                    |             |                   |                            |         |           |        |        |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies      |                                            | PR** 1                                                                                                             | PR 2        | PR 3              | PR 4                       | PR 5    | PR 6      | PR 7   | PR 8   | PR 9              | PR 10 |
|                                                                          | LO1                                        | 5                                                                                                                  | 4           | 4                 | 2                          | 1       | 2         | 3      | 1      | 3                 | 1     |
|                                                                          | LO 2                                       | 5                                                                                                                  | 5           | 4                 | 3                          | 2       | 3         | 3      | 3      | 3                 | 2     |



|                                       |                                                                                                                                                                                                                                                                                                                                                     |                                                  |                       |                   |                                          |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------|-------------------|------------------------------------------|
| <b>Course Content</b>                 | A computer engineering network design course covers network types (LANs, WANs), architecture models (OSI, TCP/IP), and design methodologies. Core topics include subnetting, routing protocols, Quality of Service (QoS), network security (firewalls, encryption), and network implementation through projects and simulations like Packet Tracer. |                                                  |                       |                   |                                          |
| <b>Topics to be Covered Each Week</b> | <b>Week</b>                                                                                                                                                                                                                                                                                                                                         | <b>Subject</b>                                   |                       | <b>Activities</b> | <b>Source</b>                            |
|                                       | 1                                                                                                                                                                                                                                                                                                                                                   | Introduction to Computer Network Design          |                       |                   |                                          |
|                                       | 2                                                                                                                                                                                                                                                                                                                                                   | The Network Development Life Cycle               |                       | I                 | 1,2&3                                    |
|                                       | 3                                                                                                                                                                                                                                                                                                                                                   | Network Analysis and Design Methodology          |                       | I                 | 1,2&3                                    |
|                                       | 4                                                                                                                                                                                                                                                                                                                                                   | The Science of Network Design                    |                       | I                 | 1,2&3                                    |
|                                       | 5                                                                                                                                                                                                                                                                                                                                                   | Traffic Flow Analysis and Performance Evaluation |                       | KR                | 1,2&3                                    |
|                                       | 6                                                                                                                                                                                                                                                                                                                                                   | Network Simulation and Traffic Measurement Tools |                       | KR                | 1,2&3                                    |
|                                       | 7                                                                                                                                                                                                                                                                                                                                                   | Midterm Week                                     |                       | PS                | 1,2&3                                    |
|                                       | 8                                                                                                                                                                                                                                                                                                                                                   | Topology Design and Terminal Assignment          |                       | KR                | 1,2&3                                    |
|                                       | 9                                                                                                                                                                                                                                                                                                                                                   | LAN and WAN Network Design                       |                       | KR                | 1,2&3                                    |
|                                       | 10                                                                                                                                                                                                                                                                                                                                                  | Addressing and Routing                           |                       | PS                | 1,2&3                                    |
|                                       | 11                                                                                                                                                                                                                                                                                                                                                  | Reliability and Redundancy                       |                       | PS                | 1,2&3                                    |
|                                       | 12                                                                                                                                                                                                                                                                                                                                                  | Network Management and Security                  |                       | PS                | 1,2&3                                    |
|                                       | 13                                                                                                                                                                                                                                                                                                                                                  | Structured Cabling Systems                       |                       | PS                | 1,2&3                                    |
|                                       | 14                                                                                                                                                                                                                                                                                                                                                  | Final Exam                                       |                       | PS                | 1,2&3                                    |
| <b>Evaluation Criteria</b>            | <b>Method</b>                                                                                                                                                                                                                                                                                                                                       |                                                  | <b>Contribution %</b> | <b>Source</b>     | <b>Relevant Qualifications</b>           |
|                                       |                                                                                                                                                                                                                                                                                                                                                     | Final Exam                                       | 40                    | 1,2&3             | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |

|                                                                                                                                             |   |                                                                                                                                    |                                 |       |                                  |                                                     |                                 |                 |                      |          |
|---------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------|----------------------------------|-----------------------------------------------------|---------------------------------|-----------------|----------------------|----------|
|                                                                                                                                             |   | Quiz                                                                                                                               | 30                              | 1,2&3 | PR1,PR2,PR3,PR4,PR5,PR7,PR8      |                                                     |                                 |                 |                      |          |
|                                                                                                                                             |   | Project                                                                                                                            | 30                              | 1,2&3 | PR1,PR2,PR3,PR4,PR5,PR7,PR8      |                                                     |                                 |                 |                      |          |
|                                                                                                                                             |   |                                                                                                                                    |                                 |       |                                  |                                                     |                                 |                 |                      |          |
|                                                                                                                                             |   |                                                                                                                                    |                                 |       |                                  |                                                     |                                 |                 |                      |          |
| <b>Limitations on the Use of Computer Network Design</b>                                                                                    | * | Limitations in computer network design include scalability, security vulnerabilities                                               |                                 |       |                                  |                                                     |                                 |                 |                      |          |
|                                                                                                                                             | * | Traditional networks are often difficult to scale and manage                                                                       |                                 |       |                                  |                                                     |                                 |                 |                      |          |
|                                                                                                                                             | * | lack robust security and quality-of-service guarantees,                                                                            |                                 |       |                                  |                                                     |                                 |                 |                      |          |
|                                                                                                                                             | * | and require manual configuration which can be error-prone and complex                                                              |                                 |       |                                  |                                                     |                                 |                 |                      |          |
|                                                                                                                                             | * | Other limitations involve budget and schedule constraints,and the need for specialized personnel with high-level technical skills. |                                 |       |                                  |                                                     |                                 |                 |                      |          |
| <b>Learning Program</b>                                                                                                                     |   |                                                                                                                                    |                                 |       |                                  |                                                     |                                 |                 |                      |          |
| <b>Educational Tool</b>                                                                                                                     |   | <b>Quantity</b>                                                                                                                    | <b>Student Workload (Hours)</b> |       | <b>Educational Tool</b>          | <b>Quantity</b>                                     | <b>Student Workload (Hours)</b> |                 |                      |          |
| Course Hours                                                                                                                                |   | 14                                                                                                                                 | 14x3                            | 42    | Problem Solving Sessions         | 6                                                   | 6x3                             | 18              |                      |          |
| Preparation for Quiz                                                                                                                        |   | 1                                                                                                                                  | 1x4                             | 4     | Knowledge Reinforcement Sessions | 4                                                   | 4x3                             | 12              |                      |          |
| Quiz                                                                                                                                        |   | 1                                                                                                                                  | 1x2                             | 2     | Instructor-led Sessions          | 4                                                   | 4x3                             | 12              |                      |          |
| Preparation for the Final Exam                                                                                                              |   | 1                                                                                                                                  | 1x8                             | 8     |                                  |                                                     |                                 |                 |                      |          |
| Final Exam                                                                                                                                  |   | 1                                                                                                                                  | 1x2                             | 2     |                                  |                                                     |                                 |                 |                      |          |
|                                                                                                                                             |   |                                                                                                                                    |                                 |       |                                  |                                                     |                                 |                 |                      |          |
| <b>Total Workload</b>                                                                                                                       |   |                                                                                                                                    | <b>100</b>                      |       |                                  | <b>Estimated ECTS Credit (Total Workload/ 30) :</b> |                                 | <b>3.333333</b> | <b>Approximately</b> | <b>3</b> |
| <b>For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions</b> |   |                                                                                                                                    |                                 |       |                                  |                                                     |                                 |                 |                      |          |

\*\* Program Requirements

| NEAR EAST UNIVERSITY - ARTIFICIAL INTELLIGENCE AND INFORMATICS      |                                            |                                                                                                                           |             |                         |      |            |      |              |      |                   |       |
|---------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------|------|------------|------|--------------|------|-------------------|-------|
| COMPUTER ENGINEERING                                                |                                            |                                                                                                                           |             |                         |      |            |      |              |      |                   |       |
| COURSE SYLLABUS                                                     |                                            |                                                                                                                           |             |                         |      |            |      |              |      |                   |       |
| Course Code: AII404                                                 | Course Name: NEURAL NETWORKS               |                                                                                                                           |             | Course Status: ELECTIVE |      | Credits: 3 |      | ECTS: 5      |      |                   |       |
| Course Language: ENGLISH                                            | Type of Course: FACE-TO-FACE               |                                                                                                                           |             | Prerequisite: NONE      |      | Year: 4    |      | Term: SPRING |      | Continuation: %70 |       |
| Weekly Class Hours                                                  | Class time                                 | Laboratory                                                                                                                | Application | Learning Sessions       |      |            |      |              |      |                   |       |
|                                                                     | 3                                          | 0                                                                                                                         | 0           | *PS                     | *KR  |            | *R   |              | *I   |                   |       |
|                                                                     |                                            |                                                                                                                           |             | 0                       | 0    |            | 0    |              | 0    |                   |       |
| Learning Outcomes of the Course                                     | Upon completing this course, students will |                                                                                                                           |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO1                                       | Explain the architecture and functioning of artificial neural networks (ANNs) and their biological counterparts.          |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO2                                       | Derive and implement the backpropagation algorithm, understanding weight updates and gradient descent optimization.       |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO3                                       | Analyze and select appropriate activation functions (ReLU, Sigmoid, Tanh, Softmax) and loss functions for specific tasks. |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO4                                       | Build, train, and evaluate neural networks using Python and deep learning libraries (e.g., TensorFlow, PyTorch).          |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO5                                       | Solve classification and regression problems using fully connected and deep neural networks.                              |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO6                                       | Design and implement CNNs for image processing applications and RNNs/LSTMs for sequential data analysis.                  |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO7                                       | Apply neural networks in real-world applications, such as image recognition, NLP, and time-series forecasting.            |             |                         |      |            |      |              |      |                   |       |
|                                                                     | ►LO8                                       | Critically evaluate the ethical implications of AI models, including bias, fairness, and interpretability.                |             |                         |      |            |      |              |      |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies |                                            | PR 1                                                                                                                      | PR 2        | PR 3                    | PR 4 | PR 5       | PR 6 | PR 7         | PR 8 | PR 9              | PR 10 |
|                                                                     | LO1                                        | 3                                                                                                                         | 4           | 3                       | 3    | 4          | 5    | 2            | 2    | 2                 | 4     |
|                                                                     | LO 2                                       | 5                                                                                                                         | 4           | 5                       | 3    | 4          | 5    | 2            | 2    | 2                 | 4     |
|                                                                     | LO 3                                       | 5                                                                                                                         | 5           | 4                       | 3    | 4          | 5    | 2            | 2    | 2                 | 4     |



|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                      |                       |                                |                                |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------------|--------------------------------|--------------------------------|
| <b>Course Content</b>                 | Introduction to Neural Networks, Basic Neuron Models: M-P Neuron, Perceptron, Hebbian Learning, Oja's Rule, Spike-Timing Dependent Plasticity (STDP), MLP, Backpropagation, Gradient-Descent, RNNs: Long Short-Term Memory (LSTM) and Gated Recurrent Unit (GRU), Unsupervised learning: SOMs and Autoencoder, Spiking Neural Networks, Deep Learning: CNN, Generative Models, Transformers, Neurobiological and Cognitive Models |                                                      |                       |                                |                                |
| <b>Topics to be Covered Each Week</b> | <b>Week</b>                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Subject</b>                                       |                       | <b>Activities</b>              | <b>Source</b>                  |
|                                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                 | Introduction to Neural Networks                      |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                 | Learning Rules and Hebbian Learning                  |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                 | Feedforward Neural Networks                          |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 4                                                                                                                                                                                                                                                                                                                                                                                                                                 | Feedforward Neural Networks                          |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 5                                                                                                                                                                                                                                                                                                                                                                                                                                 | Recurrent Neural Networks (RNNs)                     |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 6                                                                                                                                                                                                                                                                                                                                                                                                                                 | Review                                               |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 7                                                                                                                                                                                                                                                                                                                                                                                                                                 | Visa Exam                                            |                       | -                              | 1, 2, & 3                      |
|                                       | 8                                                                                                                                                                                                                                                                                                                                                                                                                                 | Unsupervised Learning                                |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 9                                                                                                                                                                                                                                                                                                                                                                                                                                 | Unsupervised Learning and Self-Organizing Maps (SOM) |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 10                                                                                                                                                                                                                                                                                                                                                                                                                                | Spiking Neural Networks (SNNs)                       |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 11                                                                                                                                                                                                                                                                                                                                                                                                                                | Deep Learning                                        |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 12                                                                                                                                                                                                                                                                                                                                                                                                                                | Deep Learning and Advanced Architectures             |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 13                                                                                                                                                                                                                                                                                                                                                                                                                                | Convolutional Neural Networks (CNNs)                 |                       | Face-to-face Lecture           | 1, 2, & 3                      |
|                                       | 14                                                                                                                                                                                                                                                                                                                                                                                                                                | Final Exam                                           |                       | -                              | 1, 2, & 3                      |
| <b>Evaluation Criteria</b>            | <b>Method</b>                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                      | <b>Contribution %</b> | <b>Source</b>                  | <b>Relevant Qualifications</b> |
|                                       | 1                                                                                                                                                                                                                                                                                                                                                                                                                                 | Midterm Exam                                         | 25                    | Lecture notes & Textbook (1&2) | PR1-PR5                        |
|                                       | 2                                                                                                                                                                                                                                                                                                                                                                                                                                 | Final Exam                                           | 40                    | Lecture notes & Textbook (1&2) | PR1-PR8                        |
|                                       | 3                                                                                                                                                                                                                                                                                                                                                                                                                                 | Assignment 1                                         | 5                     | Lecture notes & Textbook (1&2) | PR1-PR4                        |

|                                                                                                                                      |   |                                                                                                                                                                |                          |                                |                                              |          |                          |               |  |
|--------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------|----------------------------------------------|----------|--------------------------|---------------|--|
|                                                                                                                                      | 4 | Assignment 2                                                                                                                                                   | 10                       | Lecture notes & Textbook (1&2) | PR1-PR8                                      |          |                          |               |  |
|                                                                                                                                      | 5 | Assignment 3                                                                                                                                                   | 10                       | Lecture notes & Textbook (1&2) | PR1-PR8                                      |          |                          |               |  |
|                                                                                                                                      | 6 | Quiz 1                                                                                                                                                         | 5                        | Lecture notes & Textbook (1&2) | PR1-PR4                                      |          |                          |               |  |
|                                                                                                                                      | 7 | Quiz 2                                                                                                                                                         | 5                        | Lecture notes & Textbook (1&2) | PR1-PR8                                      |          |                          |               |  |
| Limitations on the Use of Artificial Intelligence                                                                                    | * | Students are allowed to use AI tools (e.g., ChatGPT, Copilot) only for debugging and learning support, not for submitting automatically generated assignments. |                          |                                |                                              |          |                          |               |  |
|                                                                                                                                      | * |                                                                                                                                                                |                          |                                |                                              |          |                          |               |  |
|                                                                                                                                      | * |                                                                                                                                                                |                          |                                |                                              |          |                          |               |  |
|                                                                                                                                      | * |                                                                                                                                                                |                          |                                |                                              |          |                          |               |  |
|                                                                                                                                      | * |                                                                                                                                                                |                          |                                |                                              |          |                          |               |  |
| Learning Program                                                                                                                     |   |                                                                                                                                                                |                          |                                |                                              |          |                          |               |  |
| Educational Tool                                                                                                                     |   | Quantity                                                                                                                                                       | Student Workload (Hours) |                                | Educational Tool                             | Quantity | Student Workload (Hours) |               |  |
| Lecture (theory)                                                                                                                     |   | 14                                                                                                                                                             | 4                        | 56                             | Quiz Preparation                             | 2        | 5                        | 10            |  |
| Assignments                                                                                                                          |   | 3                                                                                                                                                              | 5                        | 15                             | Preparation for Course                       | 14       | 2                        | 28            |  |
| Midterm Exam                                                                                                                         |   | 1                                                                                                                                                              | 2                        | 2                              |                                              |          |                          |               |  |
| Preparation for Midterm Exam                                                                                                         |   | 1                                                                                                                                                              | 14                       | 14                             |                                              |          |                          |               |  |
| Final Exam                                                                                                                           |   | 1                                                                                                                                                              | 2                        | 2                              |                                              |          |                          |               |  |
| Preparation for Final Exam                                                                                                           |   | 1                                                                                                                                                              | 16                       | 16                             |                                              |          |                          |               |  |
| Quizzes                                                                                                                              |   | 2                                                                                                                                                              | 2                        | 4                              |                                              |          |                          |               |  |
| Total Workload                                                                                                                       |   |                                                                                                                                                                | 147                      |                                | Estimated ECTS Credit (Total Workload/ 30) : |          | 4.9                      | Approximately |  |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |   |                                                                                                                                                                |                          |                                |                                              |          |                          |               |  |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                            |                                                                                                                                             |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|--------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------|-------------------------|---------|------------|---------|------|-------------------|------|------|------|------|
| COMPUTER ENGINEERING                                                     |                                            |                                                                                                                                             |             |                   |                         |         |            |         |      |                   |      |      |      |      |
| COURSE SYLLABUS                                                          |                                            |                                                                                                                                             |             |                   |                         |         |            |         |      |                   |      |      |      |      |
| Course Code: AII406                                                      | Course Name: System Programming            |                                                                                                                                             |             |                   | Course Status: Elective |         | Credits: 3 |         |      | ECTS: 5           |      |      |      |      |
| Course Language: English Language                                        | Type of Course: Face-to-face               |                                                                                                                                             |             | Prerequisite:     |                         | Year: 4 |            | Term: 7 |      | Continuation: %70 |      |      |      |      |
| Weekly Class Hours                                                       | Class time                                 | Laboratory                                                                                                                                  | Application | Learning Sessions |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | 2                                          | 1                                                                                                                                           | 0           | *PS               |                         | *KR     |            | *R      |      | *I                |      |      |      |      |
|                                                                          |                                            |                                                                                                                                             |             | 3                 |                         | 4       |            | 2       |      | 8                 |      |      |      |      |
| Learning Outcomes of the Course                                          | Upon completing this course, students will |                                                                                                                                             |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO1                                      | Explain fundamental concepts of system programming, including processes, memory management, system calls, and file systems.                 |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO2                                      | Write programs in a low-level or systems-oriented language (e.g., C) that interact directly with the operating system through system calls. |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO3                                      | Manage process creation, synchronization, and communication using mechanisms such as pipes, signals, threads, and shared memory.            |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO4                                      | Implement memory-safe programs by applying concepts like pointers, dynamic memory allocation, and buffer management.                        |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO5                                      | Utilize OS and compiler tools (e.g., shell, build systems, debuggers, profilers) to compile, debug, and optimize system-level code.         |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO6                                      | Analyze program behavior at runtime, including performance bottlenecks, resource usage, and error conditions.                               |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO7                                      | Develop system-level utilities or components that demonstrate efficient handling of hardware and OS resources.                              |             |                   |                         |         |            |         |      |                   |      |      |      |      |
|                                                                          | ► LO8                                      | Evaluate reliability, security, and efficiency issues in system programs and apply best practices to mitigate vulnerabilities.              |             |                   |                         |         |            |         |      |                   |      |      |      |      |
| The Relationship Between Learning Outcomes and Program Competencies      |                                            | PR** 1                                                                                                                                      | PR 2        | PR 3              | PR 4                    | PR 5    | PR 6       | PR 7    | PR 8 | PR 9              | PR10 | PR11 | PR12 | PR13 |
|                                                                          | LO1                                        | 5                                                                                                                                           | 4           | 4                 | 3                       | 3       | 3          | 3       | 2    | 2                 | 3    | 4    | 3    | 5    |
|                                                                          | LO 2                                       | 4                                                                                                                                           | 4           | 4                 | 3                       | 4       | 3          | 3       | 2    | 2                 | 3    | 4    | 3    | 5    |
|                                                                          | LO 3                                       | 4                                                                                                                                           | 3           | 5                 | 5                       | 4       | 3          | 3       | 3    | 3                 | 4    | 4    | 3    | 4    |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                           |   |         |   |            |              |            |   |              |   |   |   |        |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---|---------|---|------------|--------------|------------|---|--------------|---|---|---|--------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                                         | 3 | 5       | 4 | 4          | 3            | 3          | 3 | 3            | 4 | 4 | 3 | 4      |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                                         | 3 | 5       | 5 | 5          | 4            | 3          | 3 | 3            | 4 | 4 | 3 | 4      |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                                         | 3 | 4       | 4 | 4          | 4            | 3          | 3 | 3            | 4 | 4 | 3 | 4      |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                                                                                                         | 4 | 4       | 4 | 4          | 4            | 4          | 3 | 3            | 4 | 4 | 3 | 4      |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                     | 3                                                                                                                                         | 2 | 3       | 2 | 3          | 3            | 3          | 2 | 2            | 4 | 5 | 4 | 5      |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                           |   | 1: NONE |   | 2:<br>Weak | 3:<br>MIDDLE | 4: GOOD    |   | 5: VERY GOOD |   |   |   |        |
| Course Description             | The objective of this course is to provide you with a basic understanding of the issues involved in writing system programs on a Windows, Linux or Unix system, manipulating system processes, system io, system permissions, files, directories, signals, threads, sockets, terminal, etc.                                                                                                                             |                                                                                                                                           |   |         |   |            |              |            |   |              |   |   |   |        |
| Course Objectives              | At the end of this course, students will be able to:<br>1. Develop the habit of thorough testing and become comfortable in using debugging tools<br>2. Develop complex applications using asynchronous programming techniques.<br>3. Understand the basic operating system concepts.<br>4. Display proficiency in the use of programming languages like C.<br>5. Understand the fundamentals of concurrent programming. |                                                                                                                                           |   |         |   |            |              |            |   |              |   |   |   |        |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                       | Lecture Notes.                                                                                                                            |   |         |   |            |              |            |   |              |   |   |   |        |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                       | Understanding UNIX/LINUX Programming: A Guide to Theory and Practice Bruce Molay, Prentice Hall, 2003, ISBN-10: 0130083968                |   |         |   |            |              |            |   |              |   |   |   |        |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                       | The C Programming Language, Dennis M Ritchie, Kernighan, Brian .W                                                                         |   |         |   |            |              |            |   |              |   |   |   |        |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                       | Programming For Windows by Charles Petzold                                                                                                |   |         |   |            |              |            |   |              |   |   |   |        |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                       | Computer Systems: A Programmer's Perspective (CS:APP). Randal E. Bryant and David R. O'Hallaron. Prentice Hall, 2003, ISBN 0-13-034074-X. |   |         |   |            |              |            |   |              |   |   |   |        |
| Teaching Methods of the Course | Discussion, Brainstorming, Question-Answer Technique and Case Study                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                           |   |         |   |            |              |            |   |              |   |   |   |        |
| Course Content                 | Introduction to system programming, operating systems and fundamental concepts of programming language processors, one and two pass assemblers, symbol tables, compilers and compiler design, parsing, syntax and semantic phases, optimization, relocatable and linkable loaders, operating systems design principles.                                                                                                 |                                                                                                                                           |   |         |   |            |              |            |   |              |   |   |   |        |
| Topics to be Covered Each      | Week                                                                                                                                                                                                                                                                                                                                                                                                                    | Subject                                                                                                                                   |   |         |   |            |              | Activities |   |              |   |   |   | Source |

|                     |        |                                                                                |                |        |                                                         |     |  |  |  |
|---------------------|--------|--------------------------------------------------------------------------------|----------------|--------|---------------------------------------------------------|-----|--|--|--|
| Week                | 1      | Introduction to Classes, Organize Groups and Achieving the Predefined aims.    |                |        |                                                         |     |  |  |  |
|                     | 2      | Introduction to system programming.                                            |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 3      | Operating systems and fundamental concepts of programming language processors. |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 4      | One and two pass assemblers.                                                   |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 5      | Symbol tables.                                                                 |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 6      | Compilers and compiler design.                                                 |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 7      | Visa Exam                                                                      |                |        | #VALUE!                                                 | 1&2 |  |  |  |
|                     | 8      | Compilers and compiler design.                                                 |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 9      | Parsing.                                                                       |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 10     | Syntax and semantic phases.                                                    |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 11     | Optimization.                                                                  |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 12     | Relocatable and linkable loaders.                                              |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 13     | Operating systems design principles.                                           |                |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 14     | Final Exam                                                                     |                |        |                                                         | 1&2 |  |  |  |
| Evaluation Criteria | Method |                                                                                | Contribution % | Source | Relevant Qualifications                                 |     |  |  |  |
|                     | 1      | Midterm                                                                        | 30             | 1&2    | PR1,PR2,PR3,PR4,PR5                                     |     |  |  |  |
|                     | 2      | Labs                                                                           | 10             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |     |  |  |  |
|                     | 3      | Final Exam                                                                     | 40             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |     |  |  |  |

|                                                                                                                                      |          |                                                                                                   |    |                                              |                                                         |                          |               |  |  |  |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------|----|----------------------------------------------|---------------------------------------------------------|--------------------------|---------------|--|--|--|--|---|
|                                                                                                                                      | 4        | Assignment/Project                                                                                | 10 |                                              | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |                          |               |  |  |  |  |   |
|                                                                                                                                      | 5        | Attandance                                                                                        | 10 |                                              | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |                          |               |  |  |  |  |   |
|                                                                                                                                      | 6        |                                                                                                   |    |                                              |                                                         |                          |               |  |  |  |  |   |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | All interpretations, design rationales, and code implementations must be original and verifiable. |    |                                              |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        | The use of AI-generated code or design documents is strictly prohibited in submissions.           |    |                                              |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        | AI tools may be used for grammar checks, diagram layout suggestions, and research assistance.     |    |                                              |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        |                                                                                                   |    |                                              |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        |                                                                                                   |    |                                              |                                                         |                          |               |  |  |  |  |   |
| Learning Program                                                                                                                     |          |                                                                                                   |    |                                              |                                                         |                          |               |  |  |  |  |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                          |    | Educational Tool                             | Quantity                                                | Student Workload (Hours) |               |  |  |  |  |   |
| Lecture                                                                                                                              | 14       | 14x3                                                                                              | 43 | Knowledge Reinforcement Sessions             | 5                                                       | 5x4                      | 20            |  |  |  |  |   |
| Course Preparation                                                                                                                   | 10       | 10x3                                                                                              | 30 | Final Exam                                   | 1                                                       | 1x2                      | 2             |  |  |  |  |   |
| Midterm Exam                                                                                                                         | 1        | 1x2                                                                                               | 2  | Labs                                         | 10                                                      | 10x2                     | 20            |  |  |  |  |   |
| Assignments/Reports                                                                                                                  | 2        | 2x4                                                                                               | 8  |                                              |                                                         |                          |               |  |  |  |  |   |
| Class Discussions                                                                                                                    | 5        | 5x3                                                                                               | 15 |                                              |                                                         |                          |               |  |  |  |  |   |
| In-Class Activities                                                                                                                  | 5        | 5x2                                                                                               | 10 |                                              |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      |          |                                                                                                   |    |                                              |                                                         |                          |               |  |  |  |  |   |
| Total Workload                                                                                                                       |          | 150                                                                                               |    | Estimated ECTS Credit (Total Workload/ 30) : |                                                         | 5                        | Approximately |  |  |  |  | 5 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                   |    |                                              |                                                         |                          |               |  |  |  |  |   |

\*\* Program Requirements

**NEAR EAST UNIVERSITY - Artificial Intelligence and Informatics**

**COORDINATION OF COMMON COURSES**

**COURSE SYLLABUS**

|                                                                                 |                                            |                                                        |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|---------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------|-------------|--------------------------------|----------------------------|---------|-----------|--------|------|--------|-------------------|-------|-------|-------|--|
| Course Code: AII 407                                                            | Course Name:Programming languages II       |                                                        |             |                                | Course Status:<br>Elective |         | Credits:3 |        |      | ECTS:5 |                   |       |       |       |  |
| Course Language:<br>English                                                     | Type of Course:Face to face                |                                                        |             | Prerequisite:<br>AII106,AII202 |                            | Year: 4 |           | Term:6 |      |        | Continuation: %70 |       |       |       |  |
| Weekly Class Hours                                                              | Class<br>time                              | Laboratory                                             | Application | Learning Sessions              |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | 3                                          |                                                        | 1           | *PS                            |                            | *KR     |           | *R     |      |        | *I                |       |       |       |  |
|                                                                                 |                                            |                                                        |             | 3                              |                            | 4       |           | 0      |      |        | 0                 |       |       |       |  |
| Learning Outcomes of<br>the Course                                              | Upon completing this course, students will |                                                        |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO1                                       | Develop a thorough understanding on the aim the course |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO2                                       | Components of Delphi                                   |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO3                                       | Using components palette in Delphi                     |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO4                                       | Properties of components and the available options     |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO5                                       | Events and event triggering.                           |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO6                                       | File structure of a Delphi project.                    |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO7                                       | Files of PAS, DFM & DPR extensions.                    |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
|                                                                                 | ►LO8                                       | Forms with multi document interface                    |             |                                |                            |         |           |        |      |        |                   |       |       |       |  |
| The Relationship<br>Between Learning<br>Outcomes and<br>Program<br>Competencies |                                            | PR** 1                                                 | PR 2        | PR 3                           | PR 4                       | PR 5    | PR 6      | PR 7   | PR 8 | PR 9   | PR 10             | PR 11 | PR 12 | PR 13 |  |
|                                                                                 | LO1                                        | 4                                                      | 4           | 5                              | 4                          | 5       | 4         | 4      | 3    | 4      | 4                 | 1     | 2     | 4     |  |
|                                                                                 | LO 2                                       | 3                                                      | 3           | 4                              | 4                          | 4       | 5         | 4      | 2    | 3      | 2                 | 1     | 1     | 4     |  |
|                                                                                 | LO 3                                       | 4                                                      | 4           | 4                              | 5                          | 4       | 4         | 3      | 3    | 2      | 3                 | 1     | 1     | 4     |  |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|---|---------|---|---------|-----------|------------|---|--------------|---|---|---|--------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4                                                                 | 4 | 4       | 4 | 5       | 5         | 3          | 2 | 3            | 3 | 1 | 1 | 3      |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4                                                                 | 3 | 4       | 3 | 4       | 4         | 2          | 3 | 3            | 4 | 2 | 1 | 3      |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3                                                                 | 3 | 3       | 4 | 4       | 4         | 2          | 2 | 3            | 3 | 1 | 2 | 3      |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3                                                                 | 3 | 4       | 4 | 5       | 5         | 2          | 3 | 3            | 3 | 2 | 1 | 4      |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4                                                                 | 4 | 5       | 4 | 5       | 4         | 3          | 3 | 4            | 3 | 1 | 1 | 4      |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                   |   | 1: NONE |   | 2: Weak | 3: MIDDLE | 4: GOOD    |   | 5: VERY GOOD |   |   |   |        |
| Course Description             | This course is designed for Introduction to Delphi, Organization of Forms and units, Organization of Object Inspector, The role of code in Delphi, Using components palette in Delphi, Controls and Components, Properties of components, Delphi                                                                                                                                                                                                                                            |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
| Course Objectives              | Familiarize students with the processes involved in long computer programs<br>To teach students Delphi programming logic, the creation of databases, and to form the relationships between various databases.<br>Develop a windows application quickly, efficiently and with ease, including full database techniques<br>Develop a greater understanding of the issues involved in programming language design and implementation                                                           |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Delphi Programming Explorer Jeff Dustman, Jim Michel, Don Taylor  |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Delphi for .Net Developer’s Guide First Edition by Xavier Pacheco |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
| Teaching Methods of the Course | Discussion Method, Problem Solving Method, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                                                                                             |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
| Course Content                 | Introduction to Delphi. Organization of Forms and units. Organization of Object Inspector. The role of code in Delphi. Using components palette in Delphi Controls and Components. Properties of components. Delphi and the dialogs File structure of a Delphi project. Text files. Database Formats. Creating simple Database applications.<br>Windows-Based applications to Delphi projects The Data access method. Building an Access program with a DB Navigator. Tables on the record. |                                                                   |   |         |   |         |           |            |   |              |   |   |   |        |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Subject                                                           |   |         |   |         |           | Activities |   |              |   |   |   | Source |
|                                | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Introduction to Programming languages II                          |   |         |   |         |           | KR         |   |              |   |   |   | 1&2    |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Organization of Forms and units.                                  |   |         |   |         |           | KR         |   | 1&2          |   |   |   |        |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Organization of Object Inspector.                                 |   |         |   |         |           | KR         |   | 1&2          |   |   |   |        |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The role of code in Delphi.                                       |   |         |   |         |           | KR, PS     |   | 1&2          |   |   |   |        |

|    |                                        |  |  |  |  |  |        |  |     |  |  |  |  |
|----|----------------------------------------|--|--|--|--|--|--------|--|-----|--|--|--|--|
| 5  | Using components palette in Delphi     |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |
| 6  | Controls and Components.               |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |
| 7  | Midterm Exam                           |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |
| 8  | Properties of components.              |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |
| 9  | Delphi and the dialogs                 |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |
| 10 | File structure of a Delphi project.    |  |  |  |  |  | PS     |  | 1&2 |  |  |  |  |
| 11 | Text files.                            |  |  |  |  |  | PS     |  | 1&2 |  |  |  |  |
| 12 | Database Formats.                      |  |  |  |  |  | PS     |  | 1&2 |  |  |  |  |
| 13 | Creating simple Database applications. |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |
| 14 | Creating Database applications.        |  |  |  |  |  | PS     |  | 1&2 |  |  |  |  |
| 15 | Windows-Based applications to projects |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |
| 16 | Final Exam                             |  |  |  |  |  | KR, PS |  | 1&2 |  |  |  |  |

| Evaluation Criteria | Method |              | Contribution % | Source | Relevant Qualifications                                 |
|---------------------|--------|--------------|----------------|--------|---------------------------------------------------------|
|                     | 1      | Attendance   | 10             |        |                                                         |
|                     | 2      | Assignment   | 30             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |
|                     | 3      | Midterm Exam | 20             | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |

|                                                                                                                                      |          |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------|----|------------------------------------------------------|----------------------------------------------|---------------------------------------------------------|----------|---------------|--|--|--|---|
|                                                                                                                                      | 4        | Final Exam                                                                                 | 40 |                                                      | 1&2                                          | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |          |               |  |  |  |   |
|                                                                                                                                      | 5        |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
|                                                                                                                                      | 6        |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Paragrapht 1-2 can be usedto have information about Programming Language Concepts.         |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
|                                                                                                                                      | *        | Artificial Intelligence should not be used in gathering information for research purposes. |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Learning Program                                                                                                                     |          |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                   |    | Educational Tool                                     | Quantity                                     | Student Workload (Hours)                                |          |               |  |  |  |   |
| Course Hours                                                                                                                         | 14       | 3                                                                                          | 42 | Knowledge Reinforcement and Problem Solving Sessions |                                              |                                                         |          |               |  |  |  |   |
| Tutorials                                                                                                                            | 3        | 3                                                                                          | 9  |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Assignment                                                                                                                           | 5        | 3                                                                                          | 15 |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Project/Presentation/Report                                                                                                          |          |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Midterm Examination                                                                                                                  | 1        | 22                                                                                         | 22 |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Final Examination                                                                                                                    | 1        | 28                                                                                         | 28 |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Self Study                                                                                                                           | 14       | 2,5                                                                                        | 35 |                                                      |                                              |                                                         |          |               |  |  |  |   |
| Total Workload                                                                                                                       |          | 151                                                                                        |    |                                                      | Estimated ECTS Credit (Total Workload/ 30) : |                                                         | 5.033333 | Approximately |  |  |  | 5 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                            |    |                                                      |                                              |                                                         |          |               |  |  |  |   |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                             |                                                                                                                                               |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|--------------------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|-------------------------|---------|------------|---------|---------|-------------------|------|------|------|------|
| COMPUTER ENGINEERING                                                     |                                             |                                                                                                                                               |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
| COURSE SYLLABUS                                                          |                                             |                                                                                                                                               |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
| Course Code: AII409                                                      | Course Name: Object Oriented Programming II |                                                                                                                                               |                 |                      | Course Status: Elective |         | Credits: 3 |         | ECTS: 5 |                   |      |      |      |      |
| Course Language: English Language                                        | Type of Course: Face-to-face                |                                                                                                                                               |                 | Prerequisite: AII108 |                         | Year: 4 |            | Term: 7 |         | Continuation: %70 |      |      |      |      |
| Weekly Class Hours                                                       | Class time                                  | Laboratory                                                                                                                                    | Applica<br>tion | Learning Sessions    |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | 2                                           | 1                                                                                                                                             | 0               | *PS                  |                         | *KR     |            | *R      |         | *I                |      |      |      |      |
|                                                                          |                                             |                                                                                                                                               |                 | 3                    |                         | 4       |            | 2       |         | 8                 |      |      |      |      |
| Learning Outcomes of the Course                                          | Upon completing this course, students will  |                                                                                                                                               |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO1                                        | Analyze complex problems and design effective object-oriented solutions.                                                                      |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO2                                        | Apply advanced object-oriented design principles, including data encapsulation, visibility, scope, and nested classes.                        |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO3                                        | Utilize object-oriented principles and advanced Java features to design and implement robust class hierarchies, polymorphism, and interfaces. |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO4                                        | Select and employ appropriate Java APIs for specific programming tasks.                                                                       |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO5                                        | Apply advanced programming concepts and problem-solving techniques.                                                                           |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO6                                        | Implement object-oriented, event-driven, and window-based programming paradigms.                                                              |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO7                                        | Create efficient and maintainable object-oriented designs.                                                                                    |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
|                                                                          | ►LO8                                        | Develop, test, maintain, and refactor small to medium-sized Java applications and multi-file APIs.                                            |                 |                      |                         |         |            |         |         |                   |      |      |      |      |
| The Relationship Between Learning Outcomes and Program Competencies      |                                             | PR** 1                                                                                                                                        | PR 2            | PR 3                 | PR 4                    | PR 5    | PR 6       | PR 7    | PR 8    | PR 9              | PR10 | PR11 | PR12 | PR13 |
|                                                                          | LO1                                         | 5                                                                                                                                             | 4               | 4                    | 3                       | 3       | 3          | 3       | 2       | 2                 | 3    | 4    | 3    | 5    |
|                                                                          | LO 2                                        | 4                                                                                                                                             | 4               | 4                    | 3                       | 4       | 3          | 3       | 2       | 2                 | 3    | 4    | 3    | 5    |
|                                                                          | LO 3                                        | 4                                                                                                                                             | 3               | 5                    | 5                       | 4       | 3          | 3       | 3       | 3                 | 4    | 4    | 3    | 4    |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                             |   |         |   |         |   |            |   |         |   |              |   |        |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------|---|---------|---|------------|---|---------|---|--------------|---|--------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                                                                                           | 3 | 5       | 4 | 4       | 3 | 3          | 3 | 3       | 4 | 4            | 3 | 4      |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                                                                                           | 3 | 5       | 5 | 5       | 4 | 3          | 3 | 3       | 4 | 4            | 3 | 4      |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 4                                                                                                                                                                                           | 3 | 4       | 4 | 4       | 4 | 3          | 3 | 3       | 4 | 4            | 3 | 4      |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                                                                                                                                                           | 4 | 4       | 4 | 4       | 4 | 4          | 3 | 3       | 4 | 4            | 3 | 4      |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3                                                                                                                                                                                           | 2 | 3       | 2 | 3       | 3 | 3          | 2 | 2       | 4 | 5            | 4 | 5      |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                             |   | 1: NONE |   | 2: Weak |   | 3: MIDDLE  |   | 4: GOOD |   | 5: VERY GOOD |   |        |
| Course Description             | An introduction to the theory and practice of computer programming, the emphasis of this course is on techniques of program development within the object-oriented paradigm. Fundamental ideas, object-oriented concept, meaning of modeling the real world. Currently, C++ is the programming language used in this course.                                                                                                                                                                            |                                                                                                                                                                                             |   |         |   |         |   |            |   |         |   |              |   |        |
| Course Objectives              | At the end of this course, students will be able to:<br><br>1. Analyze fundamental principles of Object-Oriented (OO) programming and apply them in Java development contexts.<br>2. Design Java applications using core OO concepts (encapsulation, inheritance, polymorphism) and advanced features.<br>3. Evaluate key object-oriented concepts for building robust systems through critical assessment.<br>4. Compare and apply OO analysis/design (OOAD) approaches to architect scalable systems. |                                                                                                                                                                                             |   |         |   |         |   |            |   |         |   |              |   |        |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Lecture Notes.                                                                                                                                                                              |   |         |   |         |   |            |   |         |   |              |   |        |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <a href="https://searchmicroservices.techtarget.com/definition/object-oriented-programming-OOP.">https://searchmicroservices.techtarget.com/definition/object-oriented-programming-OOP.</a> |   |         |   |         |   |            |   |         |   |              |   |        |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <a href="https://thatchna.weebly.com/uploads/4/1/9/3/4193382/std_c_notes_03.pdf.">https://thatchna.weebly.com/uploads/4/1/9/3/4193382/std_c_notes_03.pdf.</a>                               |   |         |   |         |   |            |   |         |   |              |   |        |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <a href="http://www3.ntu.edu.sg/home/ehchua/programming/cpp/cp3_OOP.html.">http://www3.ntu.edu.sg/home/ehchua/programming/cpp/cp3_OOP.html.</a>                                             |   |         |   |         |   |            |   |         |   |              |   |        |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                             |   |         |   |         |   |            |   |         |   |              |   |        |
| Teaching Methods of the Course | Discussion, Brainstorming, Question-Answer Technique and Case Study                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                             |   |         |   |         |   |            |   |         |   |              |   |        |
| Course Content                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                             |   |         |   |         |   |            |   |         |   |              |   |        |
| Topics to be Covered           | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Subject                                                                                                                                                                                     |   |         |   |         |   | Activities |   |         |   |              |   | Source |

|                     |        |                                                                                                                                                       |                    |        |                                                         |     |  |  |  |
|---------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------|---------------------------------------------------------|-----|--|--|--|
| Each Week           | 1      | Overview of programming languages/History of Java-Intro to Java applicationsC++/Intro toclasses and objects/Classes, objects, methods, and variables. |                    |        |                                                         |     |  |  |  |
|                     | 2      | Declaring classes and instantiating objects/Constructors/Garbage Collection/finalize.                                                                 |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 3      | Inheritance/Interfaces and Abstract Classes and methods/Creating templates and packages.                                                              |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 4      | Methods/Program modules in C++ /Random numbers/ Method overloading.                                                                                   |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 5      | Classes and Objects: A Deeper Look/ Controlling Access to methods/Constructors/Final instance variables/Creating embedded packages/Encapsulation.     |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 6      | GUI Components/ Simple GUI-Based Input/Output.                                                                                                        |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 7      | Visa Exam                                                                                                                                             |                    |        | #VALUE!                                                 | 1&2 |  |  |  |
|                     | 8      | Polymorphism.                                                                                                                                         |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 9      | Advanced Inheritance Concepts (hierarchy of abstract classes and interfaces, multiple inheritance etc).                                               |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 10     | Event-Driven Programming/Exception Handling, IO/Exceptions and Assertions.                                                                            |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 11     | Exception handling/Declaring new exception types and uncaught exceptions.                                                                             |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 12     | Inheriting constructor, Associations and Aggregations, Polymorphism and Operator overloading                                                          |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 13     | Object-oriented paradigm with the UML (Unified Modelling Language).                                                                                   |                    |        | Lecture                                                 | 1&2 |  |  |  |
|                     | 14     | Final Exam                                                                                                                                            |                    |        |                                                         | 1&2 |  |  |  |
| Evaluation Criteria | Method |                                                                                                                                                       | Contributio<br>n % | Source | Relevant Qualifications                                 |     |  |  |  |
|                     | 1      | Midterm                                                                                                                                               | 30                 | 1&2    | PR1,PR2,PR3,PR4,PR5                                     |     |  |  |  |
|                     | 2      | Labs                                                                                                                                                  | 10                 | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |     |  |  |  |
|                     | 3      | Final Exam                                                                                                                                            | 40                 | 1&2    | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |     |  |  |  |
|                     | 4      | Assignment/Project                                                                                                                                    | 10                 |        | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |     |  |  |  |

|                                                                                                                                      |          |                                                                                                   |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------|----|----------------------------------|----------------------------------------------|---------------------------------------------------------|----|---------------|--|--|--|---|--|
|                                                                                                                                      | 5        | Attendance                                                                                        | 10 |                                  |                                              | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |    |               |  |  |  |   |  |
|                                                                                                                                      | 6        |                                                                                                   |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | All interpretations, design rationales, and code implementations must be original and verifiable. |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
|                                                                                                                                      | *        | The use of AI-generated code or design documents is strictly prohibited in submissions.           |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
|                                                                                                                                      | *        | AI tools may be used for grammar checks, diagram layout suggestions, and research assistance.     |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
|                                                                                                                                      | *        |                                                                                                   |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
|                                                                                                                                      | *        |                                                                                                   |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
| Learning Program                                                                                                                     |          |                                                                                                   |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                          |    | Educational Tool                 | Quantity                                     | Student Workload (Hours)                                |    |               |  |  |  |   |  |
| Lecture                                                                                                                              | 14       | 14x3                                                                                              | 43 | Knowledge Reinforcement Sessions | 5                                            | 5x4                                                     | 20 |               |  |  |  |   |  |
| Course Preparation                                                                                                                   | 10       | 10x3                                                                                              | 30 | Final Exam                       | 1                                            | 1x2                                                     | 2  |               |  |  |  |   |  |
| Midterm Exam                                                                                                                         | 1        | 1x2                                                                                               | 2  | Labs                             | 10                                           | 10x2                                                    | 20 |               |  |  |  |   |  |
| Assignments/Reports                                                                                                                  | 2        | 2x4                                                                                               | 8  |                                  |                                              |                                                         |    |               |  |  |  |   |  |
| Class Discussions                                                                                                                    | 5        | 5x3                                                                                               | 15 |                                  |                                              |                                                         |    |               |  |  |  |   |  |
| In-Class Activities                                                                                                                  | 5        | 5x2                                                                                               | 10 |                                  |                                              |                                                         |    |               |  |  |  |   |  |
|                                                                                                                                      |          |                                                                                                   |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |
| Total Workload                                                                                                                       |          | 150                                                                                               |    |                                  | Estimated ECTS Credit (Total Workload/ 30) : |                                                         | 5  | Approximately |  |  |  | 5 |  |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                   |    |                                  |                                              |                                                         |    |               |  |  |  |   |  |

\*\* Program Requirements

**NEAR EAST UNIVERSITY - Artificial Intelligence and Informatics**

**COORDINATION OF COMMON COURSES**

**COURSE SYLLABUS**

|                                                                     |                                                      |                                                                                     |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|---------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------|-------------|------------------------------|-------------------------|---------|-----------|-----------|--------|-------------------|-------|-------|-------|-------|--|
| Course Code: AII 413                                                | Course Name: Introduction to Artificial Intelligence |                                                                                     |             |                              | Course Status: Elective |         | Credits:3 |           | ECTS:5 |                   |       |       |       |       |  |
| Course Language: English                                            | Type of Course:Face to face                          |                                                                                     |             | Prerequisite: AII102, AII202 |                         | Year: 4 |           | Term:Fall |        | Continuation: %70 |       |       |       |       |  |
| Weekly Class Hours                                                  | Class time                                           | Laboratory                                                                          | Application | Learning Sessions            |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | 3                                                    |                                                                                     | 3           | *PS                          | *KR                     |         | *R        |           | *I     |                   |       |       |       |       |  |
|                                                                     |                                                      |                                                                                     |             | 3                            | 4                       |         | 0         |           | 0      |                   |       |       |       |       |  |
| Learning Outcomes of the Course                                     | Upon completing this course, students will           |                                                                                     |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO1                                                 | Solving problem by searching                                                        |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO2                                                 | Basic representation of planning                                                    |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO3                                                 | Expert systems technology                                                           |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO4                                                 | Artificial neural network technology Pattern recognition, distributed AI systems    |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO5                                                 | Hybrid systems and Artificial neural network technology                             |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO6                                                 | This course also includes programming language of AI-PROLOG with different examples |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO7                                                 | VP-Expert Primer, Fuzzy Expert, Neuro Sell                                          |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
|                                                                     | ►LO8                                                 | Distributed AI                                                                      |             |                              |                         |         |           |           |        |                   |       |       |       |       |  |
| The Relationship Between Learning Outcomes and Program Competencies |                                                      | PR** 1                                                                              | PR 2        | PR 3                         | PR 4                    | PR 5    | PR 6      | PR 7      | PR 8   | PR 9              | PR 10 | PR 11 | PR 12 | PR 13 |  |
|                                                                     | LO1                                                  | 3                                                                                   | 3           | 4                            | 3                       | 4       | 3         | 2         | 4      | 4                 | 4     | 2     | 2     | 4     |  |
|                                                                     | LO 2                                                 | 3                                                                                   | 4           | 4                            | 4                       | 5       | 4         | 2         | 2      | 3                 | 3     | 1     | 1     | 4     |  |
|                                                                     | LO 3                                                 | 2                                                                                   | 3           | 4                            | 2                       | 4       | 4         | 3         | 2      | 2                 | 4     | 2     | 2     | 3     |  |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---|---------|---|---------|-----------|------------|---|--------------|---|---|---|--------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3                                                                                          | 4 | 4       | 4 | 4       | 4         | 3          | 3 | 3            | 3 | 2 | 2 | 3      |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3                                                                                          | 3 | 3       | 3 | 4       | 4         | 2          | 2 | 2            | 3 | 1 | 1 | 4      |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                                                          | 3 | 4       | 4 | 4       | 4         | 2          | 2 | 3            | 3 | 1 | 1 | 3      |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3                                                                                          | 3 | 3       | 3 | 5       | 3         | 2          | 3 | 2            | 4 | 1 | 2 | 4      |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4                                                                                          | 3 | 4       | 3 | 4       | 4         | 3          | 3 | 3            | 4 | 2 | 1 | 4      |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                            |   | 1: NONE |   | 2: Weak | 3: MIDDLE | 4: GOOD    |   | 5: VERY GOOD |   |   |   |        |
| Course Description             | This course is designed for Introduction to Artificial Intelligence Search Strategies in AI Fuzzy Logic, Neural Networks (NN), learning NeroSell Program, Expert Systems. Programming language of Artificial intelligence.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
| Course Objectives              | To have a basic understanding of some of the more advanced topics of AI such as learning, natural language processing<br>To have an understanding of the basic issues of knowledge representation and blind and heuristic search, as well as an understanding of other topics such as minimax, resolution, etc. that play an important role in AI programs.<br>To have a basic proficiency in a traditional AI language including an ability to write simple to intermediate programs and an ability to understand code written in that language.<br>Artificial Intelligence Programming using Prolog and VPX will be provided to help students with the programming part of the course. |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Artificial Intelligence. A modern approach. Stuart J. Russell and Peter Norvig. New Jersey |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Efraim Turban. Decision support systems and expert systems. Fourth Edition. Prentice Hall. |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
| Teaching Methods of the Course | Discussion Method, Problem Solving Method, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
| Course Content                 | Introduction to Artificial Intelligence, Search Strategies in AI Fuzzy Logic, Fuzzy Set, Neural Networks (NN)<br>Types of Neural Networks (NN,) Neural Networks (NN) learning, Nero Sell Program Expert Systems,<br>Programming language of Artificial intelligence-VPX, Programming language of Artificial intelligence-Esplan<br>Programming language of Artificial intelligence-Prolog, Hybrid systems Probabilistic Uncertainty Reasoning Belief Network Distributed AI.                                                                                                                                                                                                             |                                                                                            |   |         |   |         |           |            |   |              |   |   |   |        |
| Topics to be Covered           | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Subject                                                                                    |   |         |   |         |           | Activities |   |              |   |   |   | Source |

|                     |        |                                                        |  |                |        |     |                         |                                                         |       |     |  |  |  |  |
|---------------------|--------|--------------------------------------------------------|--|----------------|--------|-----|-------------------------|---------------------------------------------------------|-------|-----|--|--|--|--|
| Each Week           | 1      | Introduction to Artificial Intelligence                |  |                |        |     |                         |                                                         |       |     |  |  |  |  |
|                     | 2      | Search Strategies in AI                                |  |                |        |     | KR                      |                                                         | 1&2   |     |  |  |  |  |
|                     | 3      | Fuzzy Logic, Fuzzy Set,                                |  |                |        |     | KR                      |                                                         | 1&2   |     |  |  |  |  |
|                     | 4      | Expert Systems                                         |  |                |        |     | KR, PS                  |                                                         | 1&2   |     |  |  |  |  |
|                     | 5      | Programming language of Artificial intelligence-VPX    |  |                |        |     | KR, PS                  |                                                         | 1&2   |     |  |  |  |  |
|                     | 6      | Programming language of Artificial intelligence-Esplan |  |                |        |     | KR, PS                  |                                                         | 1&2   |     |  |  |  |  |
|                     | 7      | Miterm Exam                                            |  |                |        |     |                         | PS                                                      |       | 1&2 |  |  |  |  |
|                     | 8      | Neural Networks (NN)                                   |  |                |        |     | KR, PS                  |                                                         | 1&2   |     |  |  |  |  |
|                     | 9      | Types of Neural Networks                               |  |                |        |     |                         | KR, PS                                                  |       | 1&2 |  |  |  |  |
|                     | 10     | Types of Neural Networks                               |  |                |        |     |                         | KR,PS                                                   |       | 1&2 |  |  |  |  |
|                     | 11     | Neural Networks (NN) learning Nero Sell Program        |  |                |        |     | KR,PS                   |                                                         | 1&2   |     |  |  |  |  |
|                     | 12     | Hybrid systems                                         |  |                |        |     | KR,PS                   |                                                         | 1&2   |     |  |  |  |  |
|                     | 13     | Probabilistic Uncertainty Reasoning                    |  |                |        |     | KR,PS                   |                                                         | 1&2   |     |  |  |  |  |
|                     | 14     | Belief Network                                         |  |                |        |     |                         |                                                         | KR,PS | 1&2 |  |  |  |  |
|                     | 15     | Distributed AI                                         |  |                |        |     |                         |                                                         | KR,PS | 1&2 |  |  |  |  |
|                     | 16     | Final Exam                                             |  |                |        |     | KR,PS                   |                                                         | 1&2   |     |  |  |  |  |
| Evaluation Criteria | Method |                                                        |  | Contribution % | Source |     | Relevant Qualifications |                                                         |       |     |  |  |  |  |
|                     | 1      | Attendance                                             |  |                | 10     |     |                         |                                                         |       |     |  |  |  |  |
|                     | 2      | Assignment                                             |  |                | 30     | 1&2 |                         | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |       |     |  |  |  |  |

|                                                                                                                                      |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------|----|------------------------------------------------------|---------------------------------------------------------|--------------------------|---------------|--|--|--|---|
|                                                                                                                                      | 3        | Midterm Exam                                                                               | 20 | 1&2                                                  | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |                          |               |  |  |  |   |
|                                                                                                                                      | 4        | Final Exam                                                                                 | 40 | 1&2                                                  | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |                          |               |  |  |  |   |
|                                                                                                                                      | 5        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
|                                                                                                                                      | 6        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Paragrapht 1-2 can be usedto have information about Programming Language Concepts.         |    |                                                      |                                                         |                          |               |  |  |  |   |
|                                                                                                                                      | *        | Artificial Intelligence should not be used in gathering information for research purposes. |    |                                                      |                                                         |                          |               |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
| Learning Program                                                                                                                     |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                   |    | Educational Tool                                     | Quantity                                                | Student Workload (Hours) |               |  |  |  |   |
| Course Hours                                                                                                                         | 14       | 3                                                                                          | 42 | Knowledge Reinforcement and Problem Solving Sessions |                                                         |                          |               |  |  |  |   |
| Labs and Tutorials                                                                                                                   | 3        | 3                                                                                          | 9  |                                                      |                                                         |                          |               |  |  |  |   |
| Assignment                                                                                                                           | 5        | 3                                                                                          | 15 |                                                      |                                                         |                          |               |  |  |  |   |
| Project/Presentation/Report                                                                                                          |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |
| Midterm Examination                                                                                                                  | 1        | 22                                                                                         | 22 |                                                      |                                                         |                          |               |  |  |  |   |
| Final Examination                                                                                                                    | 1        | 28                                                                                         | 28 |                                                      |                                                         |                          |               |  |  |  |   |
| Self Study                                                                                                                           | 14       | 2,5                                                                                        | 35 |                                                      |                                                         |                          |               |  |  |  |   |
| Total Workload                                                                                                                       |          | 151                                                                                        |    | Estimated ECTS Credit (Total Workload/ 30) :         |                                                         | 5.033333                 | Approximately |  |  |  | 5 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |   |

\*\* Program Requirements

**NEAR EAST UNIVERSITY - Artificial Intelligence and Informatics**

**COORDINATION OF COMMON COURSES**

**COURSE SYLLABUS**

|                                                                     |                                            |                                                                |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|---------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------|-------------|-------------------------|------|-----------|------|--------|------|-------------------|-------|-------|-------|-------|--|
| Course Code: AII415                                                 | Course Name: Decision Making               |                                                                |             | Course Status: Elective |      | Credits:3 |      | ECTS:5 |      |                   |       |       |       |       |  |
| Course Language: English                                            | Type of Course:Face to face                |                                                                |             | Prerequisite: AII102    |      | Year: 4   |      | Term:5 |      | Continuation: %70 |       |       |       |       |  |
| Weekly Class Hours                                                  | Class time                                 | Laboratory                                                     | Application | Learning Sessions       |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | 3                                          | 0                                                              | 0           | *PS                     | *KR  |           | *R   |        | *I   |                   |       |       |       |       |  |
|                                                                     |                                            |                                                                |             | 3                       | 4    |           | 0    |        | 0    |                   |       |       |       |       |  |
| Learning Outcomes of the Course                                     | Upon completing this course, students will |                                                                |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO1                                       | Decision making theory and forecasting                         |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO2                                       | Impart an understanding of the role of decision making process |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO3                                       | Theories in decision making and Decision Trees                 |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO4                                       | Theories in decision making and Group decision making.         |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO5                                       | Have to understand many of the models                          |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO6                                       | Multiple regression model.                                     |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO7                                       | Theories in decision making and Time series.                   |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
|                                                                     | ►LO8                                       | Theories in decision making and forecasting.                   |             |                         |      |           |      |        |      |                   |       |       |       |       |  |
| The Relationship Between Learning Outcomes and Program Competencies |                                            | PR** 1                                                         | PR 2        | PR 3                    | PR 4 | PR 5      | PR 6 | PR 7   | PR 8 | PR 9              | PR 10 | PR 11 | PR 12 | PR 13 |  |
|                                                                     | LO1                                        | 4                                                              | 4           | 4                       | 3    | 3         | 4    | 4      | 2    | 3                 | 3     | 1     | 2     | 3     |  |
|                                                                     | LO 2                                       | 5                                                              | 3           | 4                       | 4    | 3         | 3    | 3      | 3    | 3                 | 4     | 2     | 1     | 4     |  |
|                                                                     | LO 3                                       | 4                                                              | 4           | 3                       | 3    | 4         | 5    | 3      | 2    | 3                 | 3     | 1     | 1     | 3     |  |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---|---------|---|---------|-----------|------------|---|--------------|---|---|---|--------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4                                                                                                      | 4 | 3       | 4 | 3       | 4         | 3          | 3 | 3            | 3 | 1 | 1 | 4      |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4                                                                                                      | 3 | 3       | 4 | 4       | 3         | 2          | 3 | 3            | 4 | 2 | 2 | 3      |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4                                                                                                      | 4 | 4       | 4 | 3       | 4         | 3          | 3 | 3            | 3 | 1 | 2 | 4      |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4                                                                                                      | 3 | 4       | 3 | 3       | 3         | 3          | 2 | 2            | 3 | 2 | 1 | 3      |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4                                                                                                      | 4 | 4       | 4 | 5       | 4         | 3          | 3 | 3            | 3 | 1 | 1 | 3      |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                        |   | 1: NONE |   | 2: Weak | 3: MIDDLE | 4: GOOD    |   | 5: VERY GOOD |   |   |   |        |
| Course Description             | This course is designed for Introduction to decision making. Decision making process, Decision Trees. Decision making under uncertainty. Utility theory, Group decision making, Risk theory. Risk aversion, Decision making under risk                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
| Course Objectives              | Improving decision making: characterizing risk, uncertainty and opportunity, quantifying goals and identifying alternatives, tools for multi-goal decision making, staged decision making and decision tree models, scenario building and strategic planning<br>Make better decisions through critical thinking and creative problem solving<br>Develop insight into how you make decisions on your own and in collaboration with others.<br>Recognize and remove barriers to individual and group creativity to foster an innovative work environment Feel confident in the knowledge that decisions are the best choices that will produce the best results. |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | R.A.Aliev, B. Fazlollahi and R.R.Aliev. Soft Computing and its Applications in Business and Economics, |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | K.T.Marshall and R.T.Oliver. Decision making and forecasting. MC-Graw Hill                             |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
| Teaching Methods of the Course | Discussion Method, Problem Solving Method, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
| Course Content                 | Introduction to decision making. Decision making process. Decision making under uncertainty. Utility theory. Risk theory, under uncertainty. Risk aversion. Decision making under conflict. Queuing theory. Decision Trees. Decision Trees. Under uncertainty. Multiple regression models. Exponential smoothing. Group decision making. Linear regression model and correlation. Time series. Forecast accuracy. Non linear models for forecasting.                                                                                                                                                                                                           |                                                                                                        |   |         |   |         |           |            |   |              |   |   |   |        |
| Topics to be Covered           | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Subject                                                                                                |   |         |   |         |           | Activities |   |              |   |   |   | Source |

|                     |        |                                                   |  |                |        |     |                         |                                                         |     |     |  |  |  |  |
|---------------------|--------|---------------------------------------------------|--|----------------|--------|-----|-------------------------|---------------------------------------------------------|-----|-----|--|--|--|--|
| Each Week           | 1      | Introduction to decision making.                  |  |                |        |     | KR                      |                                                         | 1&2 |     |  |  |  |  |
|                     | 2      | Decision making process.                          |  |                |        |     | KR                      |                                                         | 1&2 |     |  |  |  |  |
|                     | 3      | Decision making under uncertainty.                |  |                |        |     | KR                      |                                                         | 1&2 |     |  |  |  |  |
|                     | 4      | Utility theory.                                   |  |                |        |     | KR, PS                  |                                                         | 1&2 |     |  |  |  |  |
|                     | 5      | Risk theory, under uncertainty. Risk aversion.    |  |                |        |     | KR, PS                  |                                                         | 1&2 |     |  |  |  |  |
|                     | 6      | Decision making under conflict.                   |  |                |        |     | KR, PS                  |                                                         | 1&2 |     |  |  |  |  |
|                     | 7      | Midterm Exam                                      |  |                |        |     |                         | KR, PS                                                  |     | 1&2 |  |  |  |  |
|                     | 8      | Queuing theory.                                   |  |                |        |     | KR, PS                  |                                                         | 1&2 |     |  |  |  |  |
|                     | 9      | Decision Trees.                                   |  |                |        |     |                         | KR, PS                                                  |     | 1&2 |  |  |  |  |
|                     | 10     | Decision Trees. Under uncertainty.                |  |                |        |     |                         | KR, PS                                                  |     | 1&2 |  |  |  |  |
|                     | 11     | Multiple regression model. Exponential smoothing. |  |                |        |     | KR, PS                  |                                                         | 1&2 |     |  |  |  |  |
|                     | 12     | Linear regression model and correlation.          |  |                |        |     | KR, PS                  |                                                         | 1&2 |     |  |  |  |  |
|                     | 13     | Group decision making.                            |  |                |        |     | KR, PS                  |                                                         | 1&2 |     |  |  |  |  |
|                     | 14     | Time series. Forecast accuracy.                   |  |                |        |     |                         | KR, PS                                                  |     | 1&2 |  |  |  |  |
|                     | 15     | Non linear models for forecasting.                |  |                |        |     |                         | KR, PS                                                  |     | 1&2 |  |  |  |  |
|                     | 16     | Final Exam                                        |  |                |        |     | PS                      |                                                         | 1&2 |     |  |  |  |  |
| Evaluation Criteria | Method |                                                   |  | Contribution % | Source |     | Relevant Qualifications |                                                         |     |     |  |  |  |  |
|                     | 1      | Attendance                                        |  |                | 10     |     |                         |                                                         |     |     |  |  |  |  |
|                     | 2      | Assignment                                        |  |                | 30     | 1&2 |                         | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |     |     |  |  |  |  |

|                                                                                                                                      |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------------|----|------------------------------------------------------|---------------------------------------------------------|--------------------------|---------------|--|--|--|--|---|
|                                                                                                                                      | 3        | Midterm Exam                                                                               | 20 | 1&2                                                  | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |                          |               |  |  |  |  |   |
|                                                                                                                                      | 4        | Final Exam                                                                                 | 40 | 1&2                                                  | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10,PR11,PR12,PR13 |                          |               |  |  |  |  |   |
|                                                                                                                                      | 5        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | 6        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Paragrapht 1-2-3 can be usedto have information about Programming Language Concepts.       |    |                                                      |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        | Artificial Intelligence should not be used in gathering information for research purposes. |    |                                                      |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
|                                                                                                                                      | *        |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
| Learning Program                                                                                                                     |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                   |    | Educational Tool                                     | Quantity                                                | Student Workload (Hours) |               |  |  |  |  |   |
| Course Hours                                                                                                                         | 14       | 3                                                                                          | 42 | Knowledge Reinforcement and Problem Solving Sessions |                                                         |                          |               |  |  |  |  |   |
| Tutorials                                                                                                                            | 3        | 3                                                                                          | 9  |                                                      |                                                         |                          |               |  |  |  |  |   |
| Assignment                                                                                                                           | 5        | 3                                                                                          | 15 |                                                      |                                                         |                          |               |  |  |  |  |   |
| Project/Presentation/Report                                                                                                          |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |
| Midterm Examination                                                                                                                  | 1        | 22                                                                                         | 22 |                                                      |                                                         |                          |               |  |  |  |  |   |
| Final Examination                                                                                                                    | 1        | 28                                                                                         | 28 |                                                      |                                                         |                          |               |  |  |  |  |   |
| Self Study                                                                                                                           | 14       | 2,5                                                                                        | 35 |                                                      |                                                         |                          |               |  |  |  |  |   |
| Total Workload                                                                                                                       |          | 151                                                                                        |    | Estimated ECTS Credit (Total Workload/ 30) :         |                                                         | 5.033333                 | Approximately |  |  |  |  | 5 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                            |    |                                                      |                                                         |                          |               |  |  |  |  |   |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                            |                                                                                                                                   |             |                   |                         |         |      |           |      |                      |       |
|--------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------|-------------------------|---------|------|-----------|------|----------------------|-------|
| DEPARTMENT OF SOFTWARE ENGINEERING                                       |                                            |                                                                                                                                   |             |                   |                         |         |      |           |      |                      |       |
| COURSE SYLLABUS                                                          |                                            |                                                                                                                                   |             |                   |                         |         |      |           |      |                      |       |
| Course Code:<br>AII417                                                   | Course Name: Mobile Computing              |                                                                                                                                   |             |                   | Course Status: ELECTIVE |         |      | Credits:3 |      | ECTS:3               |       |
| Course Language:<br>ENGLISH                                              | Type of Course:DISTANCE                    |                                                                                                                                   |             | Prerequisite: -   |                         | Year: 3 |      | Term:5    |      | Continuation:<br>%70 |       |
| Weekly Class Hours                                                       | Class time                                 | Laboratory                                                                                                                        | Application | Learning Sessions |                         |         |      |           |      |                      |       |
|                                                                          | 3                                          | 0                                                                                                                                 | 0           | *PS               | *KR                     |         | *R   |           | *I   |                      |       |
|                                                                          |                                            |                                                                                                                                   |             | 3                 | 3                       |         | 0    |           | 3    |                      |       |
| Learning Outcomes of the Course                                          | Upon completing this course, students will |                                                                                                                                   |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO1                                       | Learning outcomes for a mobile computing course typically involve developing the skills to design and create mobile applications. |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO2                                       | Understanding the underlying technology and architectures,                                                                        |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO3                                       | And evaluating the unique challenges and opportunities of mobile environments.                                                    |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO4                                       | Key outcomes include applying development platforms,                                                                              |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO5                                       | Using device-specific features like sensors and location awareness,                                                               |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO6                                       | And addressing issues like security and data storage.                                                                             |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO7                                       |                                                                                                                                   |             |                   |                         |         |      |           |      |                      |       |
|                                                                          | ►LO8                                       |                                                                                                                                   |             |                   |                         |         |      |           |      |                      |       |
| The Relationship Between Learning Outcomes and Program Competencies      |                                            | PR** 1                                                                                                                            | PR 2        | PR 3              | PR 4                    | PR 5    | PR 6 | PR 7      | PR 8 | PR 9                 | PR 10 |
|                                                                          | LO1                                        | 5                                                                                                                                 | 4           | 4                 | 2                       | 1       | 2    | 3         | 1    | 3                    | 1     |
|                                                                          | LO 2                                       | 5                                                                                                                                 | 5           | 4                 | 3                       | 2       | 3    | 3         | 3    | 3                    | 2     |
|                                                                          | LO 3                                       | 4                                                                                                                                 | 4           | 4                 | 5                       | 3       | 3    | 3         | 3    | 3                    | 1     |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                      |   |         |   |         |            |         |   |              |        |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---|---------|---|---------|------------|---------|---|--------------|--------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3                                                                                                                    | 5 | 3       | 4 | 3       | 4          | 3       | 3 | 2            | 1      |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                                                                                    | 4 | 5       | 3 | 2       | 3          | 3       | 3 | 4            | 2      |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                                                                                    | 4 | 4       | 3 | 3       | 2          | 5       | 3 | 2            | 2      |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 5                                                                                                                    | 3 | 3       | 4 | 5       | 5          | 3       | 5 | 4            | 3      |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1                                                                                                                    | 2 | 2       | 1 | 2       | 1          | 3       | 4 | 5            | 5      |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                      |   | 1: NONE |   | 2: Weak | 3: MIDDLE  | 4: GOOD |   | 5: VERY GOOD |        |
| Course Description             | A mobile computing course typically covers the principles, technologies, and applications of mobile systems, including wireless networks like Wi-Fi and cellular (2G, 3G, 4G), mobile operating systems, and mobile software development. Students learn to design, test, and deploy mobile applications by creating programs that utilize a device's capabilities, such as sensors and internet connectivity. The curriculum often includes concepts like mobile IP, ad-hoc and sensor networks, security for mobile environments, and emerging topics like augmented reality and AI in mobile devices. |                                                                                                                      |   |         |   |         |            |         |   |              |        |
| Course Objectives              | Course objectives for mobile computing typically involve understanding fundamental concepts, exploring both the theoretical and practical challenges of mobile systems, and developing hands-on skills in designing and building applications for mobile platforms. Students learn about mobile networks, application development with modern platforms like Android and iOS, and how to leverage device-specific features such as location awareness and sensors.                                                                                                                                       |                                                                                                                      |   |         |   |         |            |         |   |              |        |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Lecture Notes                                                                                                        |   |         |   |         |            |         |   |              |        |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mobile Computing: Technology and Applications<br>Mutamed Khatib, Nael Salman · 2018                                  |   |         |   |         |            |         |   |              |        |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mobile Computing: A Book of<br>Papers presented at the National Conference on Mobile Computing, 11-12 December 2001. |   |         |   |         |            |         |   |              |        |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                      |   |         |   |         |            |         |   |              |        |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                      |   |         |   |         |            |         |   |              |        |
| Teaching Methods of the Course | Problem-Solving Method, Expository Teaching Method, and Discovery Learning Method.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                      |   |         |   |         |            |         |   |              |        |
| Course Content                 | A mobile computing course typically covers wireless communication and network fundamentals, mobile application development, and the architecture and challenges of mobile systems. Key topics include different wireless network types (cellular, WLAN, WPAN), mobility management, mobile operating systems like Android and iOS, and the design and development of mobile applications with a focus on user experience.                                                                                                                                                                                |                                                                                                                      |   |         |   |         |            |         |   |              |        |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Subject                                                                                                              |   |         |   |         | Activities |         |   |              | Source |
|                                | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | A mobile computing course typically covers system models,                                                            |   |         |   |         |            |         |   |              |        |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | A mobile computing course typically covers system models,                                                            |   |         |   |         | I          |         |   | 1,2&3        |        |

|                                                   |        |                                                                                                                                                      |                |        |                                          |       |
|---------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------|------------------------------------------|-------|
|                                                   | 3      | Mobile networking, and application development,                                                                                                      |                |        | I                                        | 1,2&3 |
|                                                   | 4      | User interface (UI) design,                                                                                                                          |                |        | I                                        | 1,2&3 |
|                                                   | 5      | Data handling,                                                                                                                                       |                |        | KR                                       | 1,2&3 |
|                                                   | 6      | Midterams                                                                                                                                            |                |        | KR                                       | 1,2&3 |
|                                                   | 7      | And advanced subjects like security, energy efficiency                                                                                               |                |        | PS                                       | 1,2&3 |
|                                                   | 8      | And sensing.                                                                                                                                         |                |        | KR                                       | 1,2&3 |
|                                                   | 9      | The schedule progresses from foundational concepts like platform introductions and basic UI building to more complex areas such as background tasks, |                |        | KR                                       | 1,2&3 |
|                                                   | 10     | The schedule progresses from foundational concepts like platform introductions and basic UI building to more complex areas such as background tasks, |                |        | PS                                       | 1,2&3 |
|                                                   | 11     | Multimedia,                                                                                                                                          |                |        | PS                                       | 1,2&3 |
|                                                   | 12     | And deployment,                                                                                                                                      |                |        | PS                                       | 1,2&3 |
|                                                   | 13     | Sometimes concluding with project work or system optimization,                                                                                       |                |        | PS                                       | 1,2&3 |
|                                                   | 14     | Final Exam                                                                                                                                           |                |        | PS                                       | 1,2&3 |
| Evaluation Criteria                               | Method |                                                                                                                                                      | Contribution % | Source | Relevant Qualifications                  |       |
|                                                   |        | Final Exam                                                                                                                                           | 40             | 1,2&3  | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |       |
|                                                   |        | Quiz                                                                                                                                                 | 30             | 1,2&3  | PR1,PR2,PR3,PR4,PR5,PR7,PR8              |       |
|                                                   |        | Midterm                                                                                                                                              | 30             | 1,2&3  | PR1,PR2,PR3,PR4,PR5,PR7,PR8              |       |
|                                                   |        |                                                                                                                                                      |                |        |                                          |       |
|                                                   |        |                                                                                                                                                      |                |        |                                          |       |
| Limitations on the Use of Artificial Intelligence | *      | The use of GenAI tools in exams and clearly designated individual assignments is strictly forbidden and will be treated as academic dishonesty.      |                |        |                                          |       |
|                                                   | *      | Presenting text or code generated by GenAI as your own work without proper attribution constitutes plagiarism                                        |                |        |                                          |       |

|                                                                                                                                      |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------|----------------------------------------------|--------------------------|----------|---------------|---|
|                                                                                                                                      | *        | In all permissible instances, you are required to clearly state the purpose and extent of GenAI usage within your submission.                       |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | All text and code derived from GenAI tools must be properly cited using an appropriate academic referencing style.                                  |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | The student bears the sole responsibility for verifying the accuracy and currency of any information (text, code, or data) produced by GenAI tools. |    |                                  |                                              |                          |          |               |   |
| Learning Program                                                                                                                     |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                                                                            |    | Educational Tool                 | Quantity                                     | Student Workload (Hours) |          |               |   |
| Course Hours                                                                                                                         | 14       | 14x3                                                                                                                                                | 42 | Problem Solving Sessions         | 6                                            | 6x3                      | 18       |               |   |
| Preparation for Quiz                                                                                                                 | 1        | 1x4                                                                                                                                                 | 4  | Knowledge Reinforcement Sessions | 4                                            | 4x3                      | 12       |               |   |
| Quiz                                                                                                                                 | 1        | 1x2                                                                                                                                                 | 2  | Instructor-led Sessions          | 4                                            | 4x3                      | 12       |               |   |
| Preparation for the Final Exam                                                                                                       | 1        | 1x8                                                                                                                                                 | 8  |                                  |                                              |                          |          |               |   |
| Final Exam                                                                                                                           | 1        | 1x2                                                                                                                                                 | 2  |                                  |                                              |                          |          |               |   |
|                                                                                                                                      |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |
| Total Workload                                                                                                                       |          | 100                                                                                                                                                 |    |                                  | Estimated ECTS Credit (Total Workload/ 30) : |                          | 3.333333 | Approximately | 3 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                                                                     |    |                                  |                                              |                          |          |               |   |

\*\* Program  
Requirements

| NEAR EAST UNIVERSITY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------|---------|---------------------------|------|------------|------|--------------------|-------|
| INFORMATION SYSTEMS ENGINEERING                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
| COURSE SYLLABUS                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
| Course Code: AII428                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Course Name: Electronic Government                                                                                                                                             |                 |                   |         | Course Status: Compulsory |      | Credits: 3 |      | ECTS: 5            |       |
| Course Language: English                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Type of Course: Face-to-face                                                                                                                                                   | Prerequisite: - |                   |         | Year: 4                   |      | Term: Fall |      | Continuation: % 70 |       |
| Weekly Class Hours                                                        | Class time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Laboratory                                                                                                                                                                     | Application     | Learning Sessions |         |                           |      |            |      |                    |       |
|                                                                           | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                |                 | *PS               |         | *KR                       |      | *R         |      | *I                 |       |
|                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                |                 | 1                 |         | 1                         |      |            |      | 1                  |       |
| Learning Outcomes of the Course                                           | Upon completing this course, students will                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | be able to know the basics of the e-governmental systems.                                                                                                                      |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | be able to know the technical background necessary for the operation of services in the e-government.                                                                          |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | be able to understand the issue of planning systems and their management.                                                                                                      |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | be able to understand the differences between the concepts of e-Government, e-Governance, e-Democracy and similar concepts.                                                    |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | be able to understand the importance of the e-government evaluation and indexes.                                                                                               |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | be able to know the EU e-government approaches.                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | be able to make connections across ideas, assess the quality of sources on which they or others rely, behave professional and ethical, and use and cite sources appropriately. |                 |                   |         |                           |      |            |      |                    |       |
| The Relationship Between Learning Outcomes and Program Competencies       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | PR** 1                                                                                                                                                                         | PR 2            | PR 3              | PR 4    | PR 5                      | PR 6 | PR 7       | PR 8 | PR 9               | PR 10 |
|                                                                           | LO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1: None                                                                                                                                                                        | 2: Weak         | 3: Middle         | 4: Good | 5: Very good              |      |            |      |                    |       |
| Course Description                                                        | Understanding eGovernment, Approaches to Management of eGovernment Systems, eGovernment Strategy, Managing Public Data, Core Management Issues for eGovernment, Emerging Management Issues for eGovernment, eGovernment System Lifecycle and Project Assessment, Analysis of Current Reality, Design of the New eGovernment System, eGovernment Risk Assessment and Mitigation, eGovernment System Construction, Implementation and Beyond, Developing eGovernment Hybrids, Overall picture of the situation and progress of eGovernment and eInclusion in European countries, Local editions of the ePractice factsheets, European eID.                                                      |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
| Course Objectives                                                         | To broaden students' perspectives on governance. To understand basic concepts in governance and their importance. To enable students to function effectively in the variety of governing environments in which they find themselves now and in the future. To help students improve their ability to make connections across ideas, read carefully, write clearly and succinctly, assess the quality of sources on which they or others rely, and use and cite sources appropriately. To reinforce students' sense of professionalism and ethical behavior. To assist students in seeing and being able to take advantage of the possibilities for improving the world via better governance. |                                                                                                                                                                                |                 |                   |         |                           |      |            |      |                    |       |
| Textbook / Resources                                                      | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Richard Heeks, Implementing and Managing eGovernment, an international text, SAGE Publications, 2006                                                                           |                 |                   |         |                           |      |            |      |                    |       |
|                                                                           | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Andreas Meier, eDemocracy & eGovernment, Stages of a Democratic Knowledge Society, Springer-Verlag Berlin Heidelberg, 2012                                                     |                 |                   |         |                           |      |            |      |                    |       |

|                                      |                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                         |                |            |                         |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------|-------------------------|
|                                      | 3                                                                                                                                                                                                                                                                                                                                                                                        | Mete Yıldız, Bilgi Toplumu ve Kamu Yönetimi: e-Devlet, TBA Ulusal açık ders malzemeleri                                                                 |                |            |                         |
|                                      | 4                                                                                                                                                                                                                                                                                                                                                                                        | Manuel Pedro Rodriguez-Bolivar (Ed.), Measuring E-government Efficiency, The Opinions of Public Administrators and Other Stakeholders, Springer, 2014   |                |            |                         |
|                                      | 5                                                                                                                                                                                                                                                                                                                                                                                        | Anthopoulos, Leonidas G., Reddick, Christopher G. (Eds.), Government e-Strategic Planning and Management, Springer, 2014                                |                |            |                         |
|                                      | 6                                                                                                                                                                                                                                                                                                                                                                                        | Marc Holzer, Aroon P. Manoharan, James Melitski. E-Government and Information Technology Management, Concepts and Best Practices. Melvin & Leigh. 2018. |                |            |                         |
|                                      | 7                                                                                                                                                                                                                                                                                                                                                                                        | Kaan Uyar, "E-devlet, Uluslararası değerlendirmeler ve e-KKTC", K.T.M.M.O.B. Elektrik Mühendisleri Odası, EMO Bilim, 41, 52-66, 2014                    |                |            |                         |
|                                      | 8                                                                                                                                                                                                                                                                                                                                                                                        | Kaan Uyar, "KKTC’de e-Dönüşüm ve e-Devlet, CypSec’17, KKTC’de e-Dönüşüm Paneli, 2017                                                                    |                |            |                         |
|                                      | 9                                                                                                                                                                                                                                                                                                                                                                                        | İnternet ve Yapay zekâ (ChatGPT, DeepSeek etc.)                                                                                                         |                |            |                         |
| Teaching Methods of the Course       | Problem Solving Method, Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                             |                                                                                                                                                         |                |            |                         |
| Course Content                       | Understanding eGovernment, eGovernment Systems Management Approaches, eGovernment Strategies, Managing Public Data, e-Government System Life Cycle and Project Evaluation, Current Reality Analysis, New e-Government System Design, eGovernment Risk Assessment and Mitigation, eGovernment System Construction, eGovernment in European Union Countries, European Electronic Identity. |                                                                                                                                                         |                |            |                         |
| Topics to be Covered Each Week       | Week                                                                                                                                                                                                                                                                                                                                                                                     | Subject                                                                                                                                                 |                | Activities | Source                  |
|                                      | 1                                                                                                                                                                                                                                                                                                                                                                                        | Introduction, Management of e-Government Systems.                                                                                                       |                | PS,KR,I    | 1,2,3,4,5,6,9           |
|                                      | 2                                                                                                                                                                                                                                                                                                                                                                                        | e-Government Strategy.                                                                                                                                  |                | PS,KR,I    | 1,2,3,4,5,6,9           |
|                                      | 3                                                                                                                                                                                                                                                                                                                                                                                        | Managing Public Data.                                                                                                                                   |                | PS,KR,I    | 1,2,3,4,5,6,9           |
|                                      | 4                                                                                                                                                                                                                                                                                                                                                                                        | Core and Emerging Management Issues for e-Government                                                                                                    |                | PS,KR,I    | 1,2,3,4,5,6,9           |
|                                      | 5                                                                                                                                                                                                                                                                                                                                                                                        | E-Government System Lifecycle and Project Assessment, Analysis of Current Reality.                                                                      |                | PS,KR,I    | 1,2,3,4,5,6,9           |
|                                      | 6                                                                                                                                                                                                                                                                                                                                                                                        | Design of the New e-Government Systems. E-Government Risk Assessment and Mitigation.                                                                    |                | PS,KR,I    | 1,2,3,4,5,6,9           |
|                                      | 7                                                                                                                                                                                                                                                                                                                                                                                        | E-Government System Construction, Implementation and Beyond.                                                                                            |                | PS,KR,I    | 1,2,3,4,5,6,9           |
|                                      | 8                                                                                                                                                                                                                                                                                                                                                                                        | Midterm exam week                                                                                                                                       |                |            |                         |
|                                      | 9                                                                                                                                                                                                                                                                                                                                                                                        | Society 5.0 and e-Government                                                                                                                            |                | PS,KR,I    | 3,7,8,9                 |
|                                      | 10                                                                                                                                                                                                                                                                                                                                                                                       | United Nations e-Government Survey                                                                                                                      |                | PS,KR,I    | 3,7,8,9                 |
|                                      | 11                                                                                                                                                                                                                                                                                                                                                                                       | Waseda University - IAC World Digital Government Ranking                                                                                                |                | PS,KR,I    | 3,7,8,9                 |
|                                      | 12                                                                                                                                                                                                                                                                                                                                                                                       | EU and e-Government.                                                                                                                                    |                | PS,KR,I    | 3,7,8,9                 |
|                                      | 13                                                                                                                                                                                                                                                                                                                                                                                       | e-Government of the Republic of Türkiye and related plans.                                                                                              |                | PS,KR,I    | 3,7,8,9                 |
|                                      | 14                                                                                                                                                                                                                                                                                                                                                                                       | e-Government of the Republic of Türkiye and related plans.                                                                                              |                | PS,KR,I    | 3,7,8,9                 |
|                                      | 15                                                                                                                                                                                                                                                                                                                                                                                       | e-TRNC. Review of the Semester.                                                                                                                         |                | PS,KR,I    | 3,7,8,9                 |
|                                      | 16                                                                                                                                                                                                                                                                                                                                                                                       | Final exam                                                                                                                                              |                |            |                         |
| Evaluation Criteria                  | Method                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                         | Contribution % | Source     | Relevant Qualifications |
|                                      | 1                                                                                                                                                                                                                                                                                                                                                                                        | Homework                                                                                                                                                | 30             | 1,-,9      |                         |
|                                      | 2                                                                                                                                                                                                                                                                                                                                                                                        | Project                                                                                                                                                 | 20             | 1,-,9      |                         |
|                                      | 3                                                                                                                                                                                                                                                                                                                                                                                        | Final exam                                                                                                                                              | 50             | 1,-,9      |                         |
| Limitations on the Use of Artificial | * The use of AI tools should not conflict with the existing principles and policies of Near East University.                                                                                                                                                                                                                                                                             |                                                                                                                                                         |                |            |                         |
|                                      | * AI tool responses can be biased, inaccurate or misleading and is further limited by their last software update. Students should not let AI tools generate facts also skip critical thinking by accepting AI generated answers without verification.                                                                                                                                    |                                                                                                                                                         |                |            |                         |

|                                                                                                                                        |                                                                                                                                                                                                                                |          |                          |    |                  |                                              |          |                          |               |  |   |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|------------------|----------------------------------------------|----------|--------------------------|---------------|--|---|
| Intelligence                                                                                                                           | * Transparency is essential in the use of AI tools. Students should specified where, why, and how they used AI tools in the bibliography and acknowledgements sections.                                                        |          |                          |    |                  |                                              |          |                          |               |  |   |
|                                                                                                                                        | * The homework and project report will be checked by the instructor for AI generated content using Turnitin AI Detection. AI generated content must not exceed 10% of the total word count of the homework and project report. |          |                          |    |                  |                                              |          |                          |               |  |   |
|                                                                                                                                        | * It is each student's responsibility to follow the guidelines and ensure their work meets academic integrity standards. Inappropriate use of the AI tools will be considered academic misconduct, resulting in a zero grade.  |          |                          |    |                  |                                              |          |                          |               |  |   |
| Learning Program                                                                                                                       |                                                                                                                                                                                                                                |          |                          |    |                  |                                              |          |                          |               |  |   |
| Educational Tool                                                                                                                       |                                                                                                                                                                                                                                | Quantity | Student Workload (Hours) |    | Educational Tool |                                              | Quantity | Student Workload (Hours) |               |  |   |
| Course duration in class                                                                                                               |                                                                                                                                                                                                                                | 14       | 3                        | 42 | Project          |                                              | 1        | 1                        | 20            |  |   |
| Self-Study                                                                                                                             |                                                                                                                                                                                                                                | 14       | 3                        | 42 | Final exam       |                                              | 1        | 28                       | 28            |  |   |
| Homework                                                                                                                               |                                                                                                                                                                                                                                | 3        | 6                        | 18 |                  |                                              |          |                          |               |  |   |
| Total Workload                                                                                                                         |                                                                                                                                                                                                                                |          | 150                      |    |                  | Estimated ECTS Credit (Total Workload/ 30) : |          | 5                        | Approximately |  | 5 |
| * For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |                                                                                                                                                                                                                                |          |                          |    |                  |                                              |          |                          |               |  |   |
| ** Program Requirements                                                                                                                |                                                                                                                                                                                                                                |          |                          |    |                  |                                              |          |                          |               |  |   |

| NEAR EAST UNIVERSTY - FACULTY OF ARTIFICIAL INTELLIGENCE AND INFORMATICS |                                            |                                                                                           |             |                   |                            |         |           |        |        |                   |       |
|--------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------|-------------|-------------------|----------------------------|---------|-----------|--------|--------|-------------------|-------|
| DEPARTMENT OF COMPUTER ENGINEERING                                       |                                            |                                                                                           |             |                   |                            |         |           |        |        |                   |       |
| COURSE SYLLABUS                                                          |                                            |                                                                                           |             |                   |                            |         |           |        |        |                   |       |
| Course Code: AII435                                                      | Course Name: Cyber Security                |                                                                                           |             |                   | Course Status:<br>ELECTIVE |         | Credits:3 |        | ECTS:3 |                   |       |
| Course Language: ENGLISH                                                 | Type of Course:DISTANCE                    |                                                                                           |             | Prerequisite: -   |                            | Year: 3 |           | Term:5 |        | Continuation: %70 |       |
| Weekly Class Hours                                                       | Class time                                 | Laboratory                                                                                | Application | Learning Sessions |                            |         |           |        |        |                   |       |
|                                                                          | 3                                          | 0                                                                                         | 0           | *PS               |                            | *KR     |           | *R     |        | *I                |       |
|                                                                          |                                            |                                                                                           |             | 3                 |                            | 3       |           | 0      |        | 3                 |       |
| Learning Outcomes of the Course                                          | Upon completing this course, students will |                                                                                           |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO1                                      | Learning outcomes for cybersecurity include the ability to analyze and respond to threats |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO2                                      | Design and implement security strategies                                                  |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO3                                      | Use security tools                                                                        |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO4                                      | Understand and apply legal and ethical guidelines                                         |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO5                                      | Communicate complex security concepts effectively to various stakeholders                 |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO6                                      | Students gain skills in areas like risk assessment                                        |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO7                                      | Incident response, system and network security                                            |             |                   |                            |         |           |        |        |                   |       |
|                                                                          | ► LO8                                      | The use of programming languages for security purposes.                                   |             |                   |                            |         |           |        |        |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies      |                                            | PR** 1                                                                                    | PR 2        | PR 3              | PR 4                       | PR 5    | PR 6      | PR 7   | PR 8   | PR 9              | PR 10 |
|                                                                          | LO1                                        | 5                                                                                         | 4           | 4                 | 2                          | 1       | 2         | 3      | 1      | 3                 | 1     |
|                                                                          | LO 2                                       | 5                                                                                         | 5           | 4                 | 3                          | 2       | 3         | 3      | 3      | 3                 | 2     |
|                                                                          | LO 3                                       | 4                                                                                         | 4           | 4                 | 5                          | 3       | 3         | 3      | 3      | 3                 | 1     |



|                                |        |                                 |                |            |                                          |
|--------------------------------|--------|---------------------------------|----------------|------------|------------------------------------------|
| Topics to be Covered Each Week | Week   | Subject                         |                | Activities | Source                                   |
|                                | 1      | Social engineering and phishing |                |            |                                          |
|                                | 2      | Social engineering and phishing |                | I          | 1,2&3                                    |
|                                | 3      | Passwords and authentication    |                | I          | 1,2&3                                    |
|                                | 4      | Passwords and authentication    |                | I          | 1,2&3                                    |
|                                | 5      | Midterms                        |                | KR         | 1,2&3                                    |
|                                | 6      | Data protection and privacy     |                | KR         | 1,2&3                                    |
|                                | 7      | Data protection and privacy     |                | PS         | 1,2&3                                    |
|                                | 8      | Data protection and privacy     |                | KR         | 1,2&3                                    |
|                                | 9      | Safe internet and mobile use    |                | KR         | 1,2&3                                    |
|                                | 10     | Safe internet and mobile use    |                | PS         | 1,2&3                                    |
|                                | 11     | Loud and remote work security,  |                | PS         | 1,2&3                                    |
|                                | 12     | Loud and remote work security,  |                | PS         | 1,2&3                                    |
|                                | 13     | ncident reporting and response. |                | PS         | 1,2&3                                    |
|                                | 14     | Final Exam                      |                | PS         | 1,2&3                                    |
| Evaluation Criteria            | Method |                                 | Contribution % | Source     | Relevant Qualifications                  |
|                                |        | Final Exam                      | 50             | 1,2&3      | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                |        | Quiz                            | 30             | 1,2&3      | PR1,PR2,PR3,PR4,PR5,PR7,PR8              |
|                                |        | Projects                        | 20             |            |                                          |
|                                |        |                                 |                |            |                                          |

|                                                                                                                                      |          |                                                                                                                                         |    |                                  |                                              |                          |          |               |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------|----------------------------------------------|--------------------------|----------|---------------|---|
|                                                                                                                                      |          |                                                                                                                                         |    |                                  |                                              |                          |          |               |   |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Limitations of cybersecurity include high costs                                                                                         |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | Complexity, and the potential for user inconvenience,                                                                                   |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | But the most significant challenges are the constantly evolving threat landscape, human error, and a shortage of skilled professionals. |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | Other limitations include the risk of a false sense of security                                                                         |    |                                  |                                              |                          |          |               |   |
|                                                                                                                                      | *        | Compatibility issues, and privacy concerns that arise from implementing security measures.                                              |    |                                  |                                              |                          |          |               |   |
| Learning Program                                                                                                                     |          |                                                                                                                                         |    |                                  |                                              |                          |          |               |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                                                                |    | Educational Tool                 | Quantity                                     | Student Workload (Hours) |          |               |   |
| Course Hours                                                                                                                         | 14       | 14x3                                                                                                                                    | 42 | Problem Solving Sessions         | 6                                            | 6x3                      | 18       |               |   |
| Preparation for Quiz                                                                                                                 | 1        | 1x4                                                                                                                                     | 4  | Knowledge Reinforcement Sessions | 4                                            | 4x3                      | 12       |               |   |
| Quiz                                                                                                                                 | 1        | 1x2                                                                                                                                     | 2  | Instructor-led Sessions          | 4                                            | 4x3                      | 12       |               |   |
| Preparation for the Final Exam                                                                                                       | 1        | 1x8                                                                                                                                     | 8  |                                  |                                              |                          |          |               |   |
| Final Exam                                                                                                                           | 1        | 1x2                                                                                                                                     | 2  |                                  |                                              |                          |          |               |   |
|                                                                                                                                      |          |                                                                                                                                         |    |                                  |                                              |                          |          |               |   |
| Total Workload                                                                                                                       |          | 100                                                                                                                                     |    |                                  | Estimated ECTS Credit (Total Workload/ 30) : |                          | 3.333333 | Approximately | 3 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                                                         |    |                                  |                                              |                          |          |               |   |

\*\* Program Requirements

| NEAR EAST UNIVERSITY - FACULTY NAME: AI and Informatics Engineering |                                               |                                                                                                                                   |             |                         |      |            |      |         |      |                   |       |
|---------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------|------|------------|------|---------|------|-------------------|-------|
| DEPARTMENT NAME: Computer Engineering                               |                                               |                                                                                                                                   |             |                         |      |            |      |         |      |                   |       |
| COURSE SYLLABUS                                                     |                                               |                                                                                                                                   |             |                         |      |            |      |         |      |                   |       |
| Course Code: AII302                                                 | Course Name: Introduction to Machine Learning |                                                                                                                                   |             | Course Status: Elective |      | Credits: 3 |      | ECTS: 5 |      |                   |       |
| Course Language: English                                            | Type of Course: Face-to-face                  |                                                                                                                                   |             | Prerequisite:           |      | Year: 3    |      | Term: 6 |      | Continuation: %70 |       |
| Weekly Class Hours                                                  | Class time                                    | Laboratory                                                                                                                        | Application | Learning Sessions       |      |            |      |         |      |                   |       |
|                                                                     | 3                                             |                                                                                                                                   |             | *PS                     | *KR  |            | *R   |         | *I   |                   |       |
|                                                                     |                                               |                                                                                                                                   |             | 0                       | 0    |            | 0    |         | 0    |                   |       |
| Learning Outcomes of the Course                                     | Upon completing this course, students will    |                                                                                                                                   |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO1                                          | Define key concepts, terminology, and types of machine learning (supervised, unsupervised, reinforcement).                        |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO2                                          | Explain the mathematical foundations of machine learning, including linear algebra, probability, and optimization principles.     |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO3                                          | Differentiate between various learning algorithms (e.g., regression, classification, clustering) and their appropriate use cases. |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO4                                          | Implement basic machine learning algorithms using programming tools such as Python and libraries like scikit-learn.               |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO5                                          | Analyze the performance of machine learning models using appropriate metrics (e.g., accuracy, precision, recall, F1-score).       |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO6                                          | Interpret model outputs and evaluate their reliability and limitations in real-world contexts.                                    |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO7                                          | Apply machine learning techniques to solve simple real-world problems and present findings effectively.                           |             |                         |      |            |      |         |      |                   |       |
|                                                                     | ►LO8                                          | Demonstrate awareness of ethical, social, and privacy considerations in the use of machine learning technologies.                 |             |                         |      |            |      |         |      |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies |                                               | PR** 1                                                                                                                            | PR 2        | PR 3                    | PR 4 | PR 5       | PR 6 | PR 7    | PR 8 | PR 9              | PR 10 |
|                                                                     | LO1                                           | 2                                                                                                                                 | 2           | 1                       | 1    | 2          | 2    | 1       | 1    | 2                 | 3     |
|                                                                     | LO 2                                          | 2                                                                                                                                 | 1           | 1                       | 1    | 3          | 2    | 2       | 1    | 1                 | 2     |
|                                                                     | LO 3                                          | 4                                                                                                                                 | 2           | 1                       | 1    | 1          | 1    | 1       | 1    | 2                 | 1     |

|                                |                                                                                                                                                                                                                                                    |                                                                                                                                         |   |         |   |         |            |           |   |         |        |              |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---|---------|---|---------|------------|-----------|---|---------|--------|--------------|
|                                | LO 4                                                                                                                                                                                                                                               | 2                                                                                                                                       | 4 | 2       | 2 | 2       | 2          | 1         | 3 | 3       | 2      |              |
|                                | LO 5                                                                                                                                                                                                                                               | 4                                                                                                                                       | 2 | 2       | 2 | 2       | 1          | 1         | 4 | 2       | 2      |              |
|                                | LO 6                                                                                                                                                                                                                                               | 2                                                                                                                                       | 3 | 3       | 2 | 4       | 4          | 1         | 1 | 2       | 2      |              |
|                                | LO7                                                                                                                                                                                                                                                | 2                                                                                                                                       | 2 | 1       | 3 | 3       | 1          | 2         | 2 | 2       | 1      |              |
|                                | LO8                                                                                                                                                                                                                                                | 3                                                                                                                                       | 2 | 1       | 1 | 3       | 3          | 2         | 1 | 1       | 3      |              |
|                                | Contribution Level                                                                                                                                                                                                                                 |                                                                                                                                         |   | 1: NONE |   | 2: Weak |            | 3: MIDDLE |   | 4: GOOD |        | 5: VERY GOOD |
| Course Description             | The Neural network paradigm and fundamentals. Training by error minimization. Back propagation algorithms. Feedback and recurrent networks. Hopfield network, Genetic algorithms. Probability and neural networks. Optimizations and constraint.   |                                                                                                                                         |   |         |   |         |            |           |   |         |        |              |
| Course Objectives              | 1. To teach the basic steps on how to train neural networks related models.<br>2. To help students understand/improve their ability to design mathematical related models.<br>3. First step introduction to AI.                                    |                                                                                                                                         |   |         |   |         |            |           |   |         |        |              |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                  | Lecture Notes                                                                                                                           |   |         |   |         |            |           |   |         |        |              |
|                                | 2                                                                                                                                                                                                                                                  | Jacek M. Zurada, Introduction to Artificial Neural Systems, PWS Publishing Company, 1995.                                               |   |         |   |         |            |           |   |         |        |              |
|                                | 3                                                                                                                                                                                                                                                  | Mohamad H. Hassoun, Fundamentals of Artificial Neural Networks, The MIT Press, 1995.                                                    |   |         |   |         |            |           |   |         |        |              |
|                                | 4                                                                                                                                                                                                                                                  | Laurene Fausett, Fundamentals of Neural Networks: Architectures, Algorithms, and Applications, Prentice Hall International, Inc., 1994. |   |         |   |         |            |           |   |         |        |              |
|                                | 5                                                                                                                                                                                                                                                  | B. D. Ripley, Pattern Recognition and Neural Networks, Cambridge University Press., 1996.                                               |   |         |   |         |            |           |   |         |        |              |
| Teaching Methods of the Course | Discussion Method, Problem Solving Method, Question-Answer Technique                                                                                                                                                                               |                                                                                                                                         |   |         |   |         |            |           |   |         |        |              |
| Course Content                 | Neural network paradigm and fundamentals, machine learning, training by error minimization, back propagation, Feedback and recurrent networks, Hopfield network, Genetic algorithms, Probability and neural networks, Optimizations and constraint |                                                                                                                                         |   |         |   |         |            |           |   |         |        |              |
| Topics to be Covered Each Week | Week                                                                                                                                                                                                                                               | Subject                                                                                                                                 |   |         |   |         | Activities |           |   |         | Source |              |
|                                | 1                                                                                                                                                                                                                                                  | Introduction to machine learning                                                                                                        |   |         |   |         | Lecture    |           |   |         | 1 & 2  |              |
|                                | 2                                                                                                                                                                                                                                                  | The Neural network paradigm and fundamentals                                                                                            |   |         |   |         | Lecture    |           |   | 1 & 2   |        |              |
|                                | 3                                                                                                                                                                                                                                                  | The Neural network paradigm and fundamentals cont.                                                                                      |   |         |   |         | Lecture    |           |   | 1 & 2   |        |              |
|                                | 4                                                                                                                                                                                                                                                  | Training by error minimization                                                                                                          |   |         |   |         | Lecture    |           |   | 1 & 2   |        |              |
|                                | 5                                                                                                                                                                                                                                                  | Training by error minimization cont                                                                                                     |   |         |   |         | Lecture    |           |   | 1 & 2   |        |              |

|                                                   |        |                                                                                                                                                                |                          |        |                         |       |          |                          |  |  |
|---------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|-------------------------|-------|----------|--------------------------|--|--|
|                                                   | 6      | Back propagation algorithms                                                                                                                                    |                          |        | Lecture                 | 1 & 2 |          |                          |  |  |
|                                                   | 7      | Visa Exam                                                                                                                                                      |                          |        |                         | 1 & 2 |          |                          |  |  |
|                                                   | 8      | Feedback and recurrent networks                                                                                                                                |                          |        | Lecture                 | 1 & 2 |          |                          |  |  |
|                                                   | 9      | Hopfield network, Genetic algorithms                                                                                                                           |                          |        | Lecture                 | 1 & 2 |          |                          |  |  |
|                                                   | 10     | Probability and neural networks                                                                                                                                |                          |        | Lecture                 | 1 & 2 |          |                          |  |  |
|                                                   | 11     | Probability and neural networks cont.                                                                                                                          |                          |        | Lecture                 | 1 & 2 |          |                          |  |  |
|                                                   | 12     | Optimizations and constraint                                                                                                                                   |                          |        | Lecture                 | 1 & 2 |          |                          |  |  |
|                                                   | 13     | Optimizations and constraint cont                                                                                                                              |                          |        | Lecture                 | 1 & 2 |          |                          |  |  |
|                                                   | 14     | Final Exam                                                                                                                                                     |                          |        | Final Exams             | 1 & 2 |          |                          |  |  |
| Evaluation Criteria                               | Method |                                                                                                                                                                | Contribution %           | Source | Relevant Qualifications |       |          |                          |  |  |
|                                                   | 1      | Attendace                                                                                                                                                      | 10                       | 1 & 2  | PR1-PR9                 |       |          |                          |  |  |
|                                                   | 2      | Assignment/Prject                                                                                                                                              | 10                       | 1 & 2  | PR1-PR10                |       |          |                          |  |  |
|                                                   | 3      | Project                                                                                                                                                        | 10                       | 1 & 2  | PR1-PR10                |       |          |                          |  |  |
|                                                   | 4      | Midterm Exams                                                                                                                                                  | 30                       | 1 & 2  | PR1-PR10                |       |          |                          |  |  |
|                                                   | 5      | Final Exams                                                                                                                                                    | 40                       | 1 & 2  | PR1-PR10                |       |          |                          |  |  |
|                                                   | 6      |                                                                                                                                                                |                          |        |                         |       |          |                          |  |  |
| Limitations on the Use of Artificial Intelligence | *      | Students are allowed to use AI tools (e.g., ChatGPT, Copilot) only for debugging and learning support, not for submitting automatically generated assignments. |                          |        |                         |       |          |                          |  |  |
|                                                   | *      |                                                                                                                                                                |                          |        |                         |       |          |                          |  |  |
|                                                   | *      |                                                                                                                                                                |                          |        |                         |       |          |                          |  |  |
|                                                   | *      |                                                                                                                                                                |                          |        |                         |       |          |                          |  |  |
|                                                   | *      |                                                                                                                                                                |                          |        |                         |       |          |                          |  |  |
| Learning Program                                  |        |                                                                                                                                                                |                          |        |                         |       |          |                          |  |  |
| Educational Tool                                  |        | Quantity                                                                                                                                                       | Student Workload (Hours) |        | Educational Tool        |       | Quantity | Student Workload (Hours) |  |  |

|                                                                                                                                      |    |     |    |                        |                                                 |    |     |               |  |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|------------------------|-------------------------------------------------|----|-----|---------------|--|-----|
| Lecture                                                                                                                              | 14 | 4   | 56 | Quiz Preparation       |                                                 | 1  | 4   | 4             |  |     |
| Assignment                                                                                                                           | 1  | 6   | 6  | Project                |                                                 | 1  | 14  | 14            |  |     |
| Midterm Exam                                                                                                                         | 1  | 2   | 2  | Preparation for Course |                                                 | 14 | 2   | 28            |  |     |
| Preparation for Midterm Exam                                                                                                         | 1  | 14  | 14 |                        |                                                 |    |     |               |  |     |
| Final Exam                                                                                                                           | 1  | 2   | 2  |                        |                                                 |    |     |               |  |     |
| Preparation for Final Exam                                                                                                           | 1  | 16  | 16 |                        |                                                 |    |     |               |  |     |
| Quiz + Lab                                                                                                                           | 1  | 2   | 2  |                        |                                                 |    |     |               |  |     |
| Total Workload                                                                                                                       |    | 144 |    |                        | Estimated ECTS Credit<br>(Total Workload/ 30) : |    | 4.8 | Approximately |  | 4.8 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |    |     |    |                        |                                                 |    |     |               |  |     |

\*\* Program  
Requirements

| NEAR EAST UNIVERSITY - FACULTY NAME: AI and Informatics Engineering |                                            |                                                                                                                                            |             |                   |                           |         |      |            |         |         |                   |
|---------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------|---------------------------|---------|------|------------|---------|---------|-------------------|
| DEPARTMENT NAME: Computer Engineering                               |                                            |                                                                                                                                            |             |                   |                           |         |      |            |         |         |                   |
| COURSE SYLLABUS                                                     |                                            |                                                                                                                                            |             |                   |                           |         |      |            |         |         |                   |
| Course Code: COM344                                                 | Course Name: Automata Theory               |                                                                                                                                            |             |                   | Course Status: Compulsory |         |      | Credits: 3 |         | ECTS: 5 |                   |
| Course Language: English                                            | Type of Course: Face-to-face               |                                                                                                                                            |             | Prerequisite:     |                           | Year: 3 |      |            | Term: 5 |         | Continuation: %70 |
| Weekly Class Hours                                                  | Class time                                 | Laboratory                                                                                                                                 | Application | Learning Sessions |                           |         |      |            |         |         |                   |
|                                                                     | 3                                          |                                                                                                                                            |             | *PS               | *KR                       |         |      | *R         |         | *I      |                   |
|                                                                     |                                            |                                                                                                                                            |             | 3                 | 4                         |         |      | 0          |         | 8       |                   |
| Learning Outcomes of the Course                                     | Upon completing this course, students will |                                                                                                                                            |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO1                                       | Explain the fundamental concepts of formal languages, grammars, and automata and their role in computer science.                           |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO2                                       | Construct deterministic and nondeterministic finite automata (DFA/NFA) for recognizing regular languages.                                  |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO3                                       | Apply regular expressions and algebraic laws to describe and manipulate regular languages.                                                 |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO4                                       | Design context-free grammars (CFGs) and analyze their relationship with pushdown automata (PDA).                                           |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO5                                       | Convert between equivalent computational models (e.g., regex ↔ NFA, NFA ↔ DFA, PDA ↔ CFG).                                                 |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO6                                       | Explain and analyze the capabilities and limitations of Turing machines as a model of computation.                                         |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO7                                       | Determine decidability and complexity properties of problems using formal methods and proof techniques (e.g., pumping lemmas, reductions). |             |                   |                           |         |      |            |         |         |                   |
|                                                                     | ►LO8                                       | Apply automata-theoretic concepts to real-world domains such as compiler construction, text processing, and verification.                  |             |                   |                           |         |      |            |         |         |                   |
| The Relationship Between Learning Outcomes and Program Competencies |                                            | PR** 1                                                                                                                                     | PR 2        | PR 3              | PR 4                      | PR 5    | PR 6 | PR 7       | PR 8    | PR 9    | PR 10             |
|                                                                     | LO1                                        | 2                                                                                                                                          | 2           | 1                 | 1                         | 2       | 2    | 1          | 1       | 2       | 3                 |
|                                                                     | LO 2                                       | 2                                                                                                                                          | 1           | 1                 | 1                         | 3       | 2    | 2          | 1       | 1       | 2                 |
|                                                                     | LO 3                                       | 4                                                                                                                                          | 2           | 1                 | 1                         | 1       | 1    | 1          | 1       | 2       | 1                 |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                |   |         |   |         |            |           |   |         |        |              |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|---|---------|---|---------|------------|-----------|---|---------|--------|--------------|
|                                | LO 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                                                                                                                              | 4 | 2       | 2 | 2       | 2          | 1         | 3 | 3       | 2      |              |
|                                | LO 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 4                                                                                                                              | 2 | 2       | 2 | 2       | 1          | 1         | 4 | 2       | 2      |              |
|                                | LO 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                                                                                                                              | 3 | 3       | 2 | 4       | 4          | 1         | 1 | 2       | 2      |              |
|                                | LO7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                                                                                                              | 2 | 1       | 3 | 3       | 1          | 2         | 2 | 2       | 1      |              |
|                                | LO8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3                                                                                                                              | 2 | 1       | 1 | 3       | 3          | 2         | 1 | 1       | 3      |              |
|                                | Contribution Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                |   | 1: NONE |   | 2: Weak |            | 3: MIDDLE |   | 4: GOOD |        | 5: VERY GOOD |
| Course Description             | The course introduces some fundamental concepts in automata theory including regular expressions, finite automata, (non-)regular languages, context-free grammars, regular grammars, Chomsky normal forms, pushdown automata, (non-)context-free languages, parsing and Turing machines.                                                                                                                                                                                                           |                                                                                                                                |   |         |   |         |            |           |   |         |        |              |
| Course Objectives              | 1. Understand the standard mathematical models of computation devices, as well as investigating the cognitive and generative capabilities of such machines.<br>2. Understand The three major foundations of computer science; the mathematical description of computational networks, the limitations of mechanical computation, and the formal specification of languages are highly interrelated disciplines, and will be covered.<br>3. Understand the concept of pattern matching/recognition. |                                                                                                                                |   |         |   |         |            |           |   |         |        |              |
| Textbook / Resources           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Lecture Notes                                                                                                                  |   |         |   |         |            |           |   |         |        |              |
|                                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Introduction to the theory of computation, third edition, by Michael Sipser. Cengage Learning, Boston USA.                     |   |         |   |         |            |           |   |         |        |              |
|                                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | John C. Martin. Introduction to Languages and the Theory of Computation. Third Edition. 2003.McGraw-Hill. ISBN: 0-07-115468-X. |   |         |   |         |            |           |   |         |        |              |
|                                | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Automata Theory Tutotialspoint; www.tutorialspoint.com.                                                                        |   |         |   |         |            |           |   |         |        |              |
|                                | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Introduction to theory of computation by Anil Maheshwari & Michiel Smid, Carleton University Ottawa Ca.                        |   |         |   |         |            |           |   |         |        |              |
| Teaching Methods of the Course | Discussion Method, Problem Solving Method, Question-Answer Technique                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                |   |         |   |         |            |           |   |         |        |              |
| Course Content                 | Regular expressions, finite automata, (non-)regular languages, context-free grammars, regular grammars, Chomsky normal forms, pushdown automata, (non-)context-free languages, parsing and Turing machines                                                                                                                                                                                                                                                                                         |                                                                                                                                |   |         |   |         |            |           |   |         |        |              |
| Topics to be Covered           | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Subject                                                                                                                        |   |         |   |         | Activities |           |   |         | Source |              |

|                     |        |                                                                             |                |        |                         |       |
|---------------------|--------|-----------------------------------------------------------------------------|----------------|--------|-------------------------|-------|
| Each Week           | 1      | Introduction to Classes, Organize Groups and Achieving the Predefined aims. |                |        | Lecture                 | 1 & 2 |
|                     | 2      | Introduction to Automata .Theory                                            |                |        | Lecture                 | 1 & 2 |
|                     | 3      | Regular expressions.                                                        |                |        | Lecture                 | 1 & 2 |
|                     | 4      | Finite Automata.                                                            |                |        | Lecture                 | 1 & 2 |
|                     | 5      | Finite Automata Ctd.                                                        |                |        | Lecture                 | 1 & 2 |
|                     | 6      | Non-regular Languages.                                                      |                |        | Lecture                 | 1 & 2 |
|                     | 7      | Visa Exam                                                                   |                |        |                         | 1 & 2 |
|                     | 8      | Context-free Grammars.                                                      |                |        | Lecture                 | 1 & 2 |
|                     | 9      | Context-free Grammars Ctd                                                   |                |        | Lecture                 | 1 & 2 |
|                     | 10     | Regular Grammars.                                                           |                |        | Lecture                 | 1 & 2 |
|                     | 11     | Regular Grammars Ctd .                                                      |                |        | Lecture                 | 1 & 2 |
|                     | 12     | Chomsky Normal Forms.                                                       |                |        | Lecture                 | 1 & 2 |
|                     | 13     | Pushdown automata, Parsing and Turing machines                              |                |        | Lecture                 | 1 & 2 |
|                     | 14     | Final Exam                                                                  |                |        | Final Exams             | 1 & 2 |
| Evaluation Criteria | Method |                                                                             | Contribution % | Source | Relevant Qualifications |       |
|                     | 1      | Attendace                                                                   | 10             | 1 & 2  | PR1-PR9                 |       |
|                     | 2      | Assignment                                                                  | 10             | 1 & 2  | PR1-PR10                |       |
|                     | 3      | Project                                                                     | 10             | 1 & 2  | PR1-PR10                |       |

|                                                                                                                                      |          |                                                                                                                                                                |    |                                              |          |                          |               |  |     |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------------------|----------|--------------------------|---------------|--|-----|
|                                                                                                                                      | 4        | Midterm Exams                                                                                                                                                  | 30 | 1 & 2                                        | PR1-PR10 |                          |               |  |     |
|                                                                                                                                      | 5        | Final Exams                                                                                                                                                    | 40 | 1 & 2                                        | PR1-PR10 |                          |               |  |     |
|                                                                                                                                      | 6        |                                                                                                                                                                |    |                                              |          |                          |               |  |     |
| Limitations on the Use of Artificial Intelligence                                                                                    | *        | Students are allowed to use AI tools (e.g., ChatGPT, Copilot) only for debugging and learning support, not for submitting automatically generated assignments. |    |                                              |          |                          |               |  |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                              |          |                          |               |  |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                              |          |                          |               |  |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                              |          |                          |               |  |     |
|                                                                                                                                      | *        |                                                                                                                                                                |    |                                              |          |                          |               |  |     |
| Learning Program                                                                                                                     |          |                                                                                                                                                                |    |                                              |          |                          |               |  |     |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours)                                                                                                                                       |    | Educational Tool                             | Quantity | Student Workload (Hours) |               |  |     |
| Lecture                                                                                                                              | 14       | 4                                                                                                                                                              | 56 | Quiz Preparation                             | 1        | 4                        | 4             |  |     |
| Assignment                                                                                                                           | 1        | 6                                                                                                                                                              | 6  | Project                                      | 1        | 14                       | 14            |  |     |
| Midterm Exam                                                                                                                         | 1        | 2                                                                                                                                                              | 2  | Preparation for Course                       | 14       | 2                        | 28            |  |     |
| Preparation for Midterm Exam                                                                                                         | 1        | 14                                                                                                                                                             | 14 |                                              |          |                          |               |  |     |
| Final Exam                                                                                                                           | 1        | 2                                                                                                                                                              | 2  |                                              |          |                          |               |  |     |
| Preparation for Final Exam                                                                                                           | 1        | 16                                                                                                                                                             | 16 |                                              |          |                          |               |  |     |
| Quiz + Lab                                                                                                                           | 1        | 2                                                                                                                                                              | 2  |                                              |          |                          |               |  |     |
| Total Workload                                                                                                                       |          | 144                                                                                                                                                            |    | Estimated ECTS Credit (Total Workload/ 30) : |          | 4.8                      | Approximately |  | 4.8 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                                                                                                                                                                |    |                                              |          |                          |               |  |     |

\*\* Program Requirements

| NEAR EAST UNIVERSTY - FACULTY NAME                                  |                                            |                                                                                      |             |                      |                           |         |           |        |        |                   |       |
|---------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------------------|-------------|----------------------|---------------------------|---------|-----------|--------|--------|-------------------|-------|
| DEPARTMENT NAME                                                     |                                            |                                                                                      |             |                      |                           |         |           |        |        |                   |       |
| COURSE SYLLABUS                                                     |                                            |                                                                                      |             |                      |                           |         |           |        |        |                   |       |
| Course Code: COM491                                                 | Course Name:Engineering Design II          |                                                                                      |             |                      | Course Status: Compulsary |         | Credits:3 |        | ECTS:7 |                   |       |
| Course Language: English                                            | Type of Course:4th year BSc program        |                                                                                      |             | Prerequisite: COM490 |                           | Year: 4 |           | Term:8 |        | Continuation: %70 |       |
| Weekly Class Hours                                                  | Class time                                 | Laboratory                                                                           | Application | Learning Sessions    |                           |         |           |        |        |                   |       |
|                                                                     | 3                                          |                                                                                      | 2           | *PS                  |                           | *KR     |           | *R     |        | *I                |       |
|                                                                     |                                            |                                                                                      |             | 5                    |                           | 4       |           |        |        |                   |       |
| Learning Outcomes of the Course                                     | Upon completing this course, students will |                                                                                      |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 1                                      | Understand and apply the fundamentals of engineering-design practices and procedures |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 2                                      | Participate in team work activities                                                  |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 3                                      | Implement the techniques of oral and written presentations                           |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 4                                      | Identify an engineering problem and assess alternative solutions                     |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 5                                      | Apply project management fundamentals                                                |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 6                                      | Understand the ethics of engineering profession and environmental issues             |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 7                                      | Interact with industry                                                               |             |                      |                           |         |           |        |        |                   |       |
|                                                                     | ►LO 8                                      | Ability to analyse and develop system                                                |             |                      |                           |         |           |        |        |                   |       |
| The Relationship Between Learning Outcomes and Program Competencies |                                            | PR** 1                                                                               | PR 2        | PR 3                 | PR 4                      | PR 5    | PR 6      | PR 7   | PR 8   | PR 9              | PR 10 |
|                                                                     | LO1                                        | 4                                                                                    | 3           | 3                    | 3                         | 2       | 3         | 2      | 2      | 2                 | 2     |
|                                                                     | LO 2                                       | 3                                                                                    | 2           | 1                    | 2                         | 2       | 2         | 1      | 4      | 3                 | 1     |
|                                                                     | LO 3                                       | 4                                                                                    | 2           | 3                    | 3                         | 3       | 3         | 1      | 2      | 2                 | 1     |

|                                |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |         |   |         |   |            |         |        |              |
|--------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------|---|---------|---|------------|---------|--------|--------------|
|                                | LO 4               | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  | 3       | 3 | 3       | 4 | 2          | 3       | 3      | 2            |
|                                | LO 5               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3                  | 2       | 2 | 3       | 2 | 2          | 2       | 2      | 2            |
|                                | LO 6               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  | 2       | 2 | 2       | 2 | 4          | 1       | 2      | 2            |
|                                | LO7                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 2                  | 2       | 3 | 3       | 3 | 2          | 2       | 2      | 2            |
|                                | LO8                | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3                  | 3       | 4 | 4       | 3 | 2          | 2       | 1      | 2            |
|                                | Contribution Level |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    | 1: NONE |   | 2: Weak |   | 3: MIDDLE  | 4: GOOD |        | 5: VERY GOOD |
| Course Description             |                    | This course is a continuation of the research initiated in the COM491 course. It focuses on the application of advanced scientific methods for solving various engineering problems and their modeling. Students engage in the development of software packages, as well as the analysis and exploration of emerging research areas in computer engineering. As part of the course requirements, students prepare and write their graduation project.                                                                                                                                                                                                                                                                                                                           |                    |         |   |         |   |            |         |        |              |
| Course Objectives              |                    | Objectives of the Course:<br>• COM491 Engineering Design II is the continuation of COM490 in which the students continue to develop their project.<br>• The purpose of the Engineering Design II is to assure/ascertain that the students have acquired the skills, knowledge and concepts necessary to perform well when they leave the university.<br>• Each student will use educational tools to broaden his/her knowledge about a particular, self-selected topic.<br>• Students are also expected to show how proficient they are in solving real world problems with certain constraints for the outcome-based evaluation by the review board.<br>• Students are expected to show their abilities on designing, developing, orally presenting and documenting a project. |                    |         |   |         |   |            |         |        |              |
| Textbook / Resources           |                    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |         |   |         |   |            |         |        |              |
|                                |                    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |         |   |         |   |            |         |        |              |
|                                |                    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |         |   |         |   |            |         |        |              |
|                                |                    | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |         |   |         |   |            |         |        |              |
|                                |                    | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |         |   |         |   |            |         |        |              |
| Teaching Methods of the Course |                    | Discussion Method, Problem Solving Method,Case Study, Question-Answer Technique, Brainstorming                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |         |   |         |   |            |         |        |              |
| Course Content                 |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |         |   |         |   |            |         |        |              |
| Topics to be Covered Each Week |                    | Week                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Subject            |         |   |         |   | Activities |         | Source |              |
|                                |                    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Project management |         |   |         |   | KR         |         |        |              |
|                                |                    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Project management |         |   |         |   | KR, PS     |         |        |              |
|                                |                    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Project management |         |   |         |   | KR, PS     |         |        |              |

|                                                          |               |                                                                                            |                       |               |                                          |
|----------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------|-----------------------|---------------|------------------------------------------|
|                                                          | 4             | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 5             | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 6             | Project management                                                                         |                       |               |                                          |
|                                                          | 7             | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 8             | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 9             | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 10            | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 11            | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 12            | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 13            | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 14            | Project management                                                                         |                       | KR, PS        |                                          |
|                                                          | 15            | Presentation to the review board                                                           |                       | KR, PS        |                                          |
|                                                          | 16            |                                                                                            |                       | KR, PS        |                                          |
| <b>Evaluation Criteria</b>                               | <b>Method</b> |                                                                                            | <b>Contribution %</b> | <b>Source</b> | <b>Relevant Qualifications</b>           |
|                                                          | 1             | Project Proposal                                                                           |                       |               |                                          |
|                                                          | 2             | Progress Report                                                                            | 10                    |               | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                                          | 3             | Evaluation of review board                                                                 | 50                    |               | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                                          | 4             | Project Supervisor's Assessment                                                            | 30                    |               | PR1,PR2,PR3,PR4,PR5,PR6,PR7,PR8,PR9,PR10 |
|                                                          | 5             | Final Report                                                                               | 10                    |               |                                          |
|                                                          | 6             | Total                                                                                      | 100                   |               |                                          |
| <b>Limitations on the Use of Artificial Intelligence</b> | *             | Artificial Intelligence should not be used in gathering information for research purposes. |                       |               |                                          |
|                                                          | *             |                                                                                            |                       |               |                                          |

|                                                                                                                                      |          |                          |    |                                              |          |                          |                   |  |   |
|--------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------------|----|----------------------------------------------|----------|--------------------------|-------------------|--|---|
|                                                                                                                                      | *        |                          |    |                                              |          |                          |                   |  |   |
|                                                                                                                                      | *        |                          |    |                                              |          |                          |                   |  |   |
|                                                                                                                                      | *        |                          |    |                                              |          |                          |                   |  |   |
| Learning Program                                                                                                                     |          |                          |    |                                              |          |                          |                   |  |   |
| Educational Tool                                                                                                                     | Quantity | Student Workload (Hours) |    | Educational Tool                             | Quantity | Student Workload (Hours) |                   |  |   |
| Course duration in class                                                                                                             |          |                          |    |                                              |          |                          |                   |  |   |
| Labs and Tutorials                                                                                                                   |          |                          |    |                                              |          |                          |                   |  |   |
| Assignment                                                                                                                           | 14       | 6                        | 84 |                                              |          |                          |                   |  |   |
| Project/Presentation/Report                                                                                                          | 4        | 7                        | 28 |                                              |          |                          |                   |  |   |
| Midterm Examination                                                                                                                  |          |                          |    |                                              |          |                          |                   |  |   |
| Final Examination                                                                                                                    | 1        | 1                        | 1  |                                              |          |                          |                   |  |   |
| Self Study                                                                                                                           | 14       | 7                        | 98 |                                              |          |                          |                   |  |   |
| Total Workload                                                                                                                       |          | 211                      |    | Estimated ECTS Credit (Total Workload/ 30) : |          | 7.03333                  | Approximatel<br>y |  | 7 |
| For activities: PS: Problem Solving Sessions, KR: Knowledge Reinforcement Sessions, R: Remedial Sessions, I: Instructor-led Sessions |          |                          |    |                                              |          |                          |                   |  |   |

\*\* Program Requirements

## 9. ASSESSMENT AND EVALUATION PRINCIPLES

### 11.4. Exam Regulations & Assessment & Grading

Exam Regulations and, Assessment, and Grading

For each course taken at NEU, the student is given one of the letter grades below by the instructor as the semester course grade. Each grade has also its ECTS grade equivalent

The table below provides the detailed information about the local letter grades, coefficients and ECTS grade equivalents.

| SCORE        | GRADE | COEFFICIENT | ECTS Grade |
|--------------|-------|-------------|------------|
| 90-100       | AA    | 4.0         | A          |
| 85-89        | BA    | 3.5         | B*         |
| 80-84        | BB    | 3.0         | B*         |
| 75-79        | CB    | 2.5         | C*         |
| 70-74        | CC    | 2.0         | C*         |
| 60-69        | DC    | 1.5         | D          |
| 50-59        | DD    | 1.0         | E          |
| 49 and below | FF    | 0.0         | F          |

\*for these ones, the higher grade is applied

In order to be successful in a course, short cycle (associate degree) and first cycle (bachelor's degree) students have to get a grade of at least DD, second cycle (master's degree) students have to get a grade of at least CC, and third cycle (Ph.D.) students have to get a grade of at least CB to pass a course. For courses which are not included in the cumulative GPA, students need to get a grade of S.

Apart from that, each local grade has its equivalent ECTS grade which makes it easier to transfer the grades of mobility periods of students. The chart above shows the ECTS grading system at NEU.

Also, among the Letter Grades;

|   |                         |
|---|-------------------------|
| I | Incomplete              |
| S | Satisfactory Completion |

|    |                         |
|----|-------------------------|
| U  | Unsatisfactory          |
| P  | Successful Progress     |
| NP | Not Successful Progress |
| EX | Exempt                  |
| NI | Not included            |
| W  | Withdrawal              |
| NA | Non-Attendance          |

Grade of I (Incomplete), is given to students who are not able to meet all the course requirements at the end of the semester or summer school due to a valid justification accepted by the instructor. Students who receive a letter grade “I” must complete their missing course requirements and receive a letter grade within one week following the date the end of semester grades or summer school grades submitted. However, in the event of special cases, this period can be extended until two weeks before the beginning of registration for the next semester, upon the recommendation of the respective Graduate School department head and the decision of that academic unit’s administrative board. Otherwise, grade of “I” will automatically become grade of FF, or grade of U.

Grade of S (Satisfactory) is given to students who are successful in non-credited courses.

Grade of U (Unsatisfactory) is given to students who are unsuccessful in non-credited courses.

Grade of P (Successful Progress) is given to students, who continue to the courses that are not included in the GPA that has a period exceeding one semester, and regularly performs the academic studies for the respective semester.

Grade of NP (Not Successful Progress) is given to students, who do not regularly perform the academic studies for the respective semester for courses that are not included in the GPA and have a period exceeding one semester.

Grade of EX (Exempt), is given to students who are exempt from some of the courses in the curriculum.

Grade of NI (Not included) is issued to identify the courses taken by the student in the program or programs which are not included in the GPA of the student. This grade is reported in the students’ transcripts with the respective letter grade. Such courses are not counted as the courses in the program that the student is registered to.

Grade of W (Withdrawal) is used for the courses that the student withdraws from in the first ten weeks of the semester following the add/drop period, upon the recommendation of his/ her advisor and the permission of the instructor that teaches the course. A student is not allowed to withdraw from courses

during the first two semesters of his/ her associate/undergraduate degree program and from those courses he/she has to repeat and received grade “W” before, which are not included in the grade average. A student is allowed to withdraw from two courses at the most during his/ her associate degree study, and four courses during his/her undergraduate study upon the recommendation of the advisor and the permission of the instructor that teaches the course. A student has to take the course that he/she withdrew from, the first semester in which it is offered.

Grade “NA” (Non-Attendance) is issued by the instructor for students who fail to fulfil the attendance and/or requirements of the course and/or who lose their right to take the end of semester exam because they failed to take any of the exams administered throughout the semester. Grade “NA” is not considered in the average calculations.

Both the ECTS grades and the local grades of the students are displayed on the official transcript of the students.

## **10.STUDENT ADMISSION AND ENROLMENT**

The admissions and entry requirements ensure that the students who are admitted to the degree program possess the required competences. Bachelor’s degree modules are fully taught in English, and thus, good English skills are required.

Students admitted to the department come from three sources:

- Local students, who are citizens of the Turkish Republic of Northern Cyprus (TRNC)
- Students from Turkey, who are Turkish citizens
- Students from other countries (foreign students)

All students are admitted to the university after they complete their high school studies successfully and obtain high school graduation diplomas.

Local students must sit for the Near East University entrance examination and obtain a pass mark from this examination. Successful students are admitted to the university, but not necessarily to the Computer Engineering Department.

Students from Turkey must select the Near East University and the Computer Engineering Department as their choice, and they must obtain successful pass marks from the Turkish university entrance examinations (prepared and administered by the Higher Education Council of Turkey, YOK). Those who obtain the required marks are admitted to the university, but not necessarily to the Computer Engineering Department.

Students from other countries are admitted to the university based on the results of their high school graduation diplomas.

Because the medium of teaching is in English, the level of their English is assessed by the Faculty of English language. Those students who have certificates and who have already passed English Language proficiency examinations are exempt from the English preparation school and are admitted directly to the department where they are enrolled for the first year and first semester of their studies. Those students whose levels of English writing and communication skills are below the required standards are admitted to the English preparatory school of the university. The English preparatory school offers concentrated teaching of the English language reading, writing, and communication skills. The duration of the preparatory school is one academic year. Successful students are admitted to the department at the end of their studies at the English preparatory school.

## **11.HORIZONTAL AND VERTICAL TRANSFER**

### **11.1.Horizontal Transfer**

Students enrolled in the Computer Engineering program may transfer to equivalent or related programs under the following conditions:

- Within the Same University:  
Students may transfer to another undergraduate program at the same university if they meet the requirements defined by the university's regulations on undergraduate education and examination. Transfers are typically based on academic performance (GPA) and available quota in the target program.
- Between Universities (Inter-Institutional Transfer):  
Students may transfer from equivalent programs at other universities, either domestically or internationally, in accordance with the Council of Higher Education (YÖK/YÖDAK) regulations. Courses successfully completed at the previous institution may be recognized through the credit transfer and course equivalence process.

### **11.2.Vertical Transfer**

Graduates of associate degree (two-year) programs in related fields such as:

- Computer Technology,
- Computer Programming,
- Information Technologies, or
- Electronics and Communication Technology

may transfer vertically to the Computer Engineering undergraduate program through the Vertical Transfer Examination (DGS) administered by ÖSYM (Student Selection and Placement Center).

- Successful candidates admitted through DGS may receive course exemptions for equivalent coursework completed during their associate degree, according to university regulations.
- Upon completion of the undergraduate program requirements, these students earn a Bachelor's Degree in Computer Engineering.

### **11.3.International Student Transfers**

- International students may apply for horizontal transfer from recognized universities abroad under the framework of bilateral agreements, exchange programs, or international student admission regulations.

- The university evaluates the equivalency of courses and academic standing before approving the transfer.

## **12. RECOGNITION AND EVALUATION OF PRIOR LEARNING**

Recognition of prior learning refers to the process of assessing and acknowledging a student's previously acquired knowledge, skills, and competencies — whether obtained through formal education, non-formal training, or informal experience.

- Students who have previously completed courses at another national or international higher education institution may apply for course exemption and credit transfer after enrollment.
- The evaluation of such applications is carried out by the Faculty/Departmental Board based on the content, learning outcomes, and credit equivalency of the courses taken previously.
- Exempted courses are recorded in the student's transcript with the corresponding credits and grades in accordance with university regulations.

A student wishing a transfer from another university: the student must prove her/his English Proficiency if she/he wishes to attend the English Section.. At the time of OSS examination the candidate's entrance score must not be less than the lowest score for admission to the Near East Computer Engineering Department. The transcript and course content of the applicant is examined by the department and the student is then accepted to the appropriate year of the programme.

### **For further details please contact:**

Faculty of Engineering  
Department of Computer Engineering,  
Near East Boulevard, P.O. Box 92202  
Nicosia, TRNC via Mersin 10-Turkey

Phone: +90 (392) 223 64 64 (ext. 291)

E-mail: [info@neu.edu.tr](mailto:info@neu.edu.tr)

## **13. INTERNATIONAL PROGRAMS AND EXCHANGE OPPORTUNITIES**

Students have the opportunity to participate in international exchange programs within the framework of Erasmus+ Program (European Union):

Enables students to study or complete internships at partner universities and institutions in European countries for one or two semesters.

Credits earned abroad are recognized through the ECTS (European Credit Transfer System) in accordance with the Learning Agreement signed before the exchange period.

Through participation in these programs, students:

- Gain international academic and professional experience,
- Improve foreign language and intercultural communication skills,
- Broaden their technical and social perspectives, and

- Strengthen their competitiveness in the global job market.

All courses and credits completed successfully at partner institutions are recognized and transferred in line with the university's regulations and ECTS-based credit transfer policies. An Erasmus/International Relations Office provides guidance on application procedures, partner institutions, and academic planning for interested students.

### **International Collaborations and Partnerships**

- The university has signed bilateral agreements with various foreign universities, research centers, and institutions, enabling joint research, academic exchange, and dual-degree opportunities.
- Faculty members also engage in international research projects, joint publications, and scientific collaborations with partners worldwide.

## **14. PROGRAM ACCREDITATION AND QUALITY ASSURANCE**

### **14.1. Quality Policy**

The Computer Engineering Program operates under a structured and continuous quality assurance system to ensure that its educational objectives, learning outcomes, and teaching processes meet national and international standards.

The Computer Engineering Program is committed to providing high-quality education, research, and community service in accordance with national and international standards. Its Quality Policy is based on continuous improvement, stakeholder satisfaction, and alignment with the university's overall quality assurance framework.

#### **Quality Policy Aims To:**

**Ensure Academic Excellence:** Deliver up-to-date, student-centered, and outcome-based education that meets the expectations of students, industry, and society.

**Promote Continuous Improvement:** Regularly assess and enhance the effectiveness of teaching, research, and administrative processes based on measurable performance indicators and stakeholder feedback.

**Strengthen Research and Innovation:** Encourage faculty and students to engage in high-quality research, technological innovation, and interdisciplinary collaboration addressing current and emerging global challenges.

**Maintain active collaboration with students, alumni, industry partners, and academic institutions** to ensure the relevance and sustainability of the program.

**Support Professional and Ethical Development:** Cultivate professionalism, social responsibility, and ethical values in all educational and research activities.

**Ensure Compliance and Transparency.** Conduct all activities in compliance with the standards and guidelines of the Council of Higher Education (YÖK/YÖDAK), and international accreditation bodies such as ASIN, MÜDEK and ABET.

**Enhance Global Competitiveness.** Develop graduates who are competent, innovative, and competitive in the global engineering and technology sectors.

### **14.2. Program Accreditation**

- The program is designed in alignment with the criteria established by the Council of Higher Education (YÖK).

- It adheres to the European Credit Transfer and Accumulation System (ECTS) and the Bologna Process principles, ensuring compatibility and recognition across European higher education institutions.
- The program's structure, outcomes, and assessment methods are also consistent with the standards of international accreditation bodies, such as ASIIN (Accreditation Agency for Degree Programmes in Engineering, Informatics, Natural Sciences and Mathematics), MÜDEK (Association for Evaluation and Accreditation of Engineering Programs) — the national accreditation agency recognized by YÖKAK and a member of ENAEE (European Network for Accreditation of Engineering Education) under the EUR-ACE framework.
- The university continuously monitors and updates the program to maintain readiness for national and international accreditation reviews (e.g., ASIIN, MÜDEK or ABET).

### 14.3. Quality Assurance

The Computer Engineering Department follows the university's Quality Assurance Policy, which focuses on continuous improvement, maintaining industry relationships and evidence-based evaluation.

The Program Assessment and Evaluation Committee regularly reviews:

- Achievement of Program Educational Objectives and Learning Outcomes (LOs),
- Curriculum relevance and course content,
- Student performance and graduation data,
- Feedback from students, alumni, employers, and academic staff, and
- Research, internship, and industry collaboration outcomes.

Based on these evaluations, the department identifies strengths, areas for improvement, and action plans to enhance educational quality and alignment with evolving technological and professional trends.

### 14.4. Research and Development Activities

Research and Development (R&D) activities in Computer Engineering focus on creating new technologies, improving existing systems, and solving complex engineering problems. These activities typically include:

- **Artificial Intelligence and Machine Learning**
  - Developing intelligent algorithms and models
  - Deep learning, reinforcement learning, and data-driven decision systems
  - AI applications in robotics, healthcare, finance, and smart cities
- **Computer Networks and Cybersecurity**
  - Design and optimization of communication networks
  - Network security, cryptography, intrusion detection, and secure systems
  - Research on 5G/6G communication technologies and IoT security
- **Software Engineering and Systems Development**
  - Software architecture, design patterns, and testing
  - Agile and DevOps methodologies
  - Development of large-scale, high-performance, and cloud-based systems
- **Embedded Systems and Internet of Things (IoT)**

- Smart sensing technologies and embedded controller design
- IoT platforms, edge computing, and real-time systems
- R&D on smart homes, industrial IoT, and wearable devices
  - **Computer Vision and Robotics**
- Image processing, object recognition, scene understanding
- Autonomous systems, UAVs, and mobile robots
- Human–robot interaction and navigation in complex environments
  - **Data Science and Big Data Analytics**
- Large-scale data processing, pattern discovery, and statistical modeling
- Data mining, predictive analytics, and decision support systems
- Cloud-based big data platforms
  - **High-Performance and Distributed Computing**
- Parallel algorithms, GPU/CPU optimization
- Cloud computing, edge computing, and distributed systems
- Scalable computing for scientific and industrial applications
  - **Hardware and VLSI Design**
- Digital system design, FPGA development, and microprocessor architecture
- Low-power hardware systems and ASIC design
- Emerging technologies such as quantum computing
  - **Human–Computer Interaction (HCI)**
- Usability studies, user experience design (UX/UI)
- Virtual reality (VR), augmented reality (AR), and multimodal interfaces
- Assistive technologies and accessibility research
  - **Emerging Research Areas**
- Quantum information processing
  - Bio-inspired computing
  - Smart city technologies
  - Autonomous vehicles
  - Sustainable computing and green technologies

## **15. GRADUATION REQUIREMENTS AND DEGREE AWARDED**

### **15.1. Graduation Requirements**

In order to graduate from this undergraduate program, the students are required;

to succeed in all of the courses listed in the curriculum of the program by getting the grade of at least DD/S with a minimum of 240 ECTS

to have a Cumulative Grade Point Average (CGPA) of 2.00 out of 4.00

to complete their compulsory internship in a specified duration and quality.

### **15.2. Degree Awarded**

Students graduating from the Computer Engineering Undergraduate program are awarded a Bachelor of Science degree in Computer Engineering.

### **Mode Of Study**

This is a full time program.

## **16. DIPLOMA SUPPLEMENT**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Diploma No: 34927</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              | <b>Diploma Date: 12.01.2017</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>1.1. Family name(s): BOSTANCI</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |              | <b>1.3. Place and date of birth: TURKEY, 15.08.1993</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |
| <b>1.2. Given name(s): GAMZE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              | <b>1.4. Student identification number: 20142886</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |
| <b>2. INFORMATION IDENTIFYING THE QUALIFICATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>2.1. Name of the qualification and (if applicable) the title conferred</b><br>BACHELOR OF SCIENCE, B.Sc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              | <b>2.4. Name and type of institution administering studies</b><br>SAME AS 2.3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |
| <b>2.2. Main field(s) of study for qualification</b><br><br>COMPUTER ENGINEERING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              | <b>2.5. Language(s) of instruction/examinations</b><br>TURKISH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |
| <b>2.3. Name and status of awarding institution</b><br>NEAR EAST UNIVERSITY, PRIVATE UNIVERSITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>3. INFORMATION ON THE LEVEL OF THE QUALIFICATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>3.1. Level of qualification</b><br>First Cycle (Bachelor's Degree)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              | <b>3.2. Official length of program</b><br>Normally 4 Years (excluding 1 year English Preparatory School, if necessary), 2 semesters per year, 16 weeks per semester                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |
| <b>3.3. Access requirement(s)</b><br>Admission of Turkish nationalities to higher education is based on a nation-wide Student Selection Examination (ÖSS) administered by the Higher Education Council of Turkey (YÖK). Admission of Turkish Republic of Northern Cyprus nationals is based on the Near East University Entrance and Placement Exam for Turkish Cypriots. Admission of foreign students is based on their high school credentials. Proof of English language proficiency is also required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>4. INFORMATION ON THE CONTENTS AND RESULTS GAINED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>4.1. Mode of study</b><br>Full-Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              | <b>4.2. Programme requirements</b><br>A student is required to have a minimum CGPA of 2.00/4.00 and no failing grades (below DD).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              |
| <b>4.3. Objectives</b><br>The aim of the computer engineering department is to prepare engineering candidates for various branches of industry with an improved self-confidence and individual initiative. Students are educated to have scientific systematic approach in solving engineering problems, sound engineering base, life-long learning habits and research abilities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              | <b>4.4. Programme details and the individual grades/marks obtained</b><br>Please see the next page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |
| <b>4.5. Grading scheme, grade translation and grade distribution guidance:</b><br>For each course taken, the student is assigned one of the following grades by the course teacher.<br>For A.Sc., B.Sc. or B.A. degrees, students must obtain at least DD or S from each course and have a GGPA of not less than 2.00 out of 4.00 and have completed all the courses and summer practices in the program. For graduate degrees, students must obtain at least CC or S from each course for M.Sc. and M.A., at least BB for Ph.D. They also need to have a GCPA of 3.00 to graduate. The student's standing is calculated in the form of a Graduate Point Average (GPA) and Cumulative Grade Point (CGPA) and is announced at the end of each semester by the Registrar's Office. The total credit points for a course are obtained by multiplying the coefficient of the final grade by the credit hours. In order to obtain the GPA for any given semester, the total credit points are divided by the total credit hours. The averages are given up to two decimal points. Students who obtain a CGPA of 3.00-3.49 at the end of a semester are considered as "Honour Students" and those who obtain a CGPA of 3.50-4.00 at the end of a semester are considered as "High Honour Students" and this is recorded in their academic report. The letter grades, the quality point equivalents are: |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>Percentage Course Coefficient</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Grade</b> | <b>Percentage Course Coefficient</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Grade</b> |
| 90-100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 4            | 70-74                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2            |
| 85-89                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.5          | 65-69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.5          |
| 80-84                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3            | 60-64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1            |
| 75-79                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.5          | 50-59                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0.5          |
| 49 and below                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | FF           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FD           |
| 1- Incomplete S- Satisfactory Completion, U-Unsatisfactory, NA-Never Attended, E-Exempted, W- Withdrawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>4.6 Overall classification of the award</b> CGPA: 3.16/4.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>5.1. Access to further study</b><br>May apply to second cycle programmes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              | <b>5.2. Professional status conferred</b><br>This degree enables the graduates to teach English in public and private institutions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |
| <b>6. ADDITIONAL INFORMATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
| <b>6.1. Additional information</b><br>The department is accredited by Edexcel Assured Services for its quality standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |              | <b>6.2. Sources for further information</b><br><b>Faculty web site</b> <a href="http://www.neu.edu.tr/en/node/6183">http://www.neu.edu.tr/en/node/6183</a><br><b>Department web site</b> <a href="http://english.neu.edu.tr/">http://english.neu.edu.tr/</a><br><b>University web site</b> <a href="http://www.neu.edu.tr">http://www.neu.edu.tr</a><br><b>The Council of Higher Education of Turkey</b> <a href="http://www.yok.gov.tr">http://www.yok.gov.tr</a><br><b>Higher Education Planning, Evaluation Accreditation and Coordination of North Cyprus Council Web site</b> <a href="http://www.ncyodak.org">http://www.ncyodak.org</a><br><b>Edexcel Quality Assured Services</b> |              |

#### 4.4. Program details and the individual grade/marks obtained:

| 1 ( 1 <sup>st</sup> Semester) |                                          |    |      |            |       | 2 ( 2 <sup>nd</sup> Semester) |                                 |    |      |            |       |
|-------------------------------|------------------------------------------|----|------|------------|-------|-------------------------------|---------------------------------|----|------|------------|-------|
| Course Code                   | Course Name                              | CR | ECTS | Status     | Grade | Course Code                   | Course Name                     | CR | ECTS | Status     | Grade |
| AIT101                        | Ataturk's Principles and Turkish Reforms | 0  | 1    | Compulsory | S     | COM121                        | Discrete Structures             | 3  | 4    | Compulsory | AA    |
| COM100                        | Computer Engineering Orientation         | 0  | 1    | Compulsory | AA    | COM162                        | Programming and Problem Solving | 4  | 6    | Compulsory | BB    |
| COM141                        | Introduction to Programming              | 4  | 6    | Compulsory | BA    | ENG102                        | English II                      | 3  | 4    | Compulsory | AA    |
| ENG101                        | English I                                | 3  | 4    | Compulsory | AA    | MAT102                        | Calculus II                     | 4  | 6    | Compulsory | DC    |
| MAT101                        | Calculus I                               | 4  | 6    | Compulsory | AA    | MAT112                        | Linear Algebra                  | 3  | 4    | Compulsory | CC    |
| PHY101                        | General Physics I                        | 4  | 6    | Compulsory | DC    | PHY102                        | General Physics II              | 4  | 6    | Compulsory | CC    |
| CHEM101                       | General Chemistry                        | 4  | 6    | Compulsory | CB    |                               |                                 |    |      |            |       |
|                               |                                          | 19 | 30   |            |       |                               |                                 | 21 | 30   |            |       |

| 3 ( 3 <sup>rd</sup> Semester) |                                |    |      |            |       | 4 ( 4 <sup>th</sup> Semester) |                               |    |      |                        |       |
|-------------------------------|--------------------------------|----|------|------------|-------|-------------------------------|-------------------------------|----|------|------------------------|-------|
| Course Code                   | Course Name                    | CR | ECTS | Status     | Grade | Course Code                   | Course Name                   | CR | ECTS | Status                 | Grade |
| COM211                        | Logic Design                   | 4  | 6    | Compulsory | AA    | COM210                        | Object-oriented Programming I | 4  | 6    | Compulsory             | CC    |
| COM201                        | Data Structures and algorithms | 4  | 6    | Compulsory | BB    | COM242                        | Database Management System    | 4  | 6    | Compulsory             | AA    |
| EE207                         | Electrical Circuits            | 3  | 6    | Compulsory | CC    | COM254                        | Computer Organization         | 3  | 6    | Compulsory             | BB    |
| MAT201                        | Differential Equations         | 4  | 6    | Compulsory | BA    | EE208                         | Basic Electronics             | 4  | 6    | Compulsory             | BA    |
| ENG210                        | English Communication Skills   | 3  | 6    | Compulsory | CB    | TUR101                        | Turkish Language              | 3  | 5    | Non-Technical Elective | CB    |
|                               |                                |    |      |            |       | COM200                        | Summer Training I             | 0  | 1    | Compulsory             | S     |
|                               |                                | 18 | 30   |            |       |                               |                               | 18 | 30   |                        |       |

| 5 ( 5 <sup>th</sup> Semester) |                               |    |      |                               |       | 6 ( 6 <sup>th</sup> Semester) |                                  |    |      |            |       |
|-------------------------------|-------------------------------|----|------|-------------------------------|-------|-------------------------------|----------------------------------|----|------|------------|-------|
| Course Code                   | Course Name                   | CR | ECTS | Status                        | Grade | Course Code                   | Course Name                      | CR | ECTS | Status     | Grade |
| COM320                        | Computer Hardware             | 3  | 6    | Restricted Technical Elective | BB    | COM312                        | Operating Systems                | 3  | 6    | Compulsory | BB    |
| COM301                        | Microprocessors               | 4  | 6    | Compulsory                    | CB    | COM322                        | Data Communications & Networking | 4  | 6    | Compulsory | BA    |
| COM360                        | Signals and Systems           | 4  | 6    | Compulsory                    | AA    | COM321                        | System Simulation                | 3  | 6    | Compulsory | AA    |
| COM339                        | Programming Language Concepts | 3  | 6    | Compulsory                    | BA    | COM333                        | Operational Research             | 3  | 5    | Compulsory | AA    |
| MAT350                        | Probability and Statistics    | 3  | 6    | Compulsory                    | BA    | COM382                        | Real Time Systems                | 3  | 6    | Compulsory | AA    |
|                               |                               |    |      |                               |       | COM300                        | Summer Training II               | 0  | 1    | Compulsory | S     |
|                               |                               | 17 | 30   |                               |       |                               |                                  | 16 | 30   |            |       |

| 7 ( 7 <sup>th</sup> Semester) |                                |    |      |                    |       | 8 ( 8 <sup>th</sup> Semester) |                            |    |      |                    |       |
|-------------------------------|--------------------------------|----|------|--------------------|-------|-------------------------------|----------------------------|----|------|--------------------|-------|
| Course Code                   | Course Name                    | CR | ECTS | Status             | Grade | Course Code                   | Course Name                | CR | ECTS | Status             | Grade |
| COM490                        | Engineering Design I           | 2  | 6    | Compulsory         | AA    | COM491                        | Engineering Design II      | 2  | 6    | Compulsory         | AA    |
| COM411                        | Software Engineering           | 3  | 6    | Compulsory         | AA    | ECON431                       | Economics for Engineers    | 3  | 6    | Compulsory         | CB    |
| COM434                        | Internet Programming           | 3  | 6    | Technical Elective | BA    | COM331                        | System Analysis and Design | 3  | 6    | Free Elective      | BA    |
| COM432                        | Programming Languages II       | 3  | 6    | Technical Elective | BB    | COM488                        | Multimedia Systems         | 3  | 6    | Technical Elective | AA    |
| COM442                        | Object Oriented Programming II | 3  | 6    | Technical Elective | AA    | COM463                        | Digital Image Processing   | 3  | 6    | Technical Elective | DC    |
|                               |                                | 14 | 30   |                    |       |                               |                            | 14 | 30   |                    |       |

**TOTAL CREDITS 137**

## 7. CERTIFICATION OF THE SUPPLEMENT

7.1. Date :12.01.2017

7.2. Name and Signature :Ümit Serdaroğlu

7.3. Capacity : Registrar

7.4. Official stamp or seal :

## **8. INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM**

The basic structure of the North Cyprus Education System consists of four main stages as pre-school education, primary education, secondary education and higher education.

Pre-school education consists of non-compulsory programs whereas primary education is a compulsory 8 year program for all children beginning from the age of 6. The secondary education system includes “General High Schools” and “Vocational and Technical High Schools”.

The Higher Education System in North Cyprus is regulated by the Higher Education Planning, Evaluation, Accreditation and Coordination Council (Yükseköğretim Planlama, Denetleme, Akreditasyon ve Koordinasyon Kurulu – YÖDAK). Established in 1988, the Council regulates the activities of higher education institutions with respect to research, governing, planning and organization. The higher education institutions are established within the framework of the Higher Education Law. All programs of higher education should be accredited by YÖDAK.

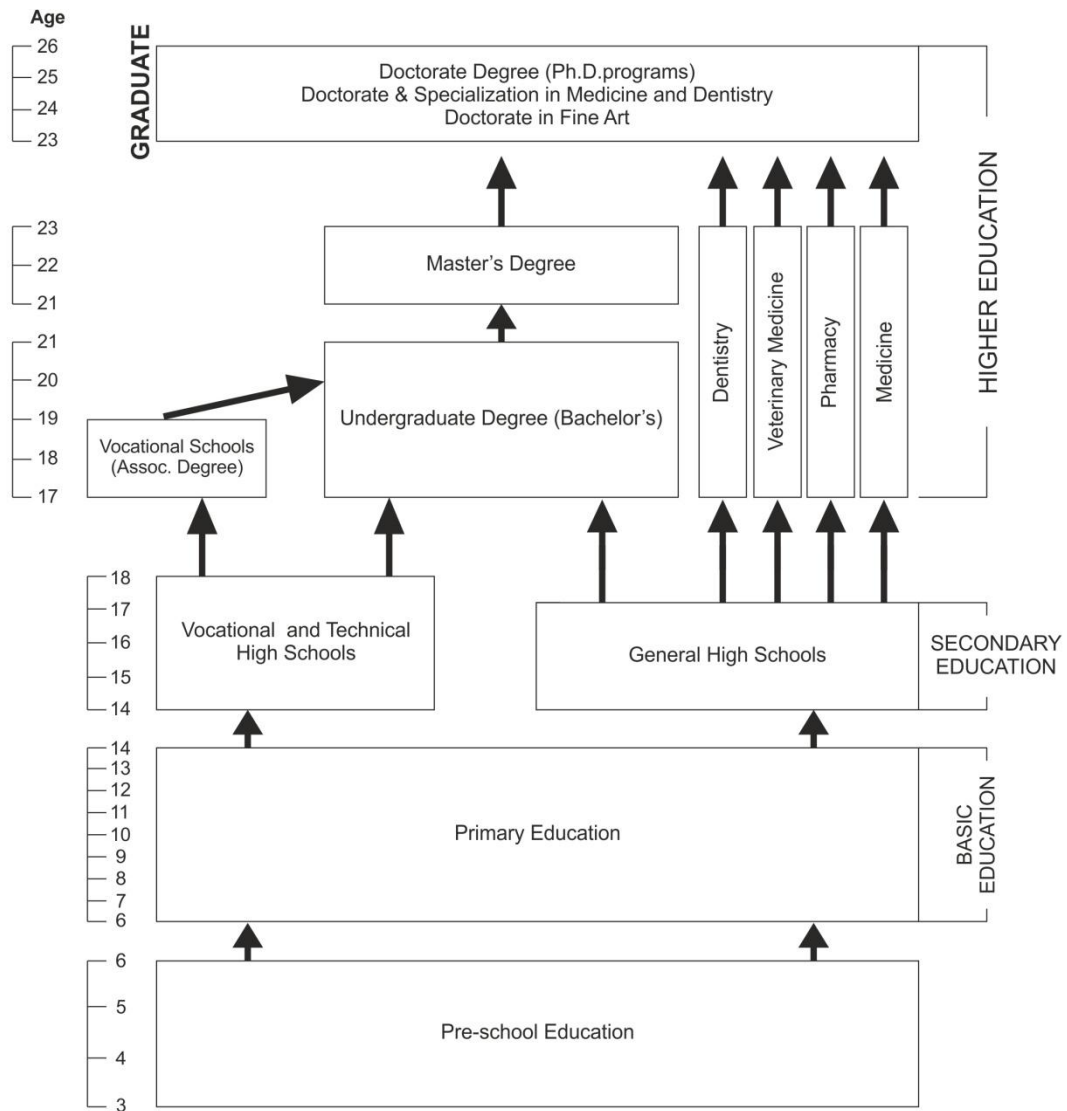
Higher education in North Cyprus comprises all post-secondary higher education programmes, consisting of short, first, second, and third cycle degrees in terms of terminology of the Bologna Process. The structure of North Cyprus higher education degrees is based on a two-tier system, except for dentistry, pharmacy, medicine and veterinary medicine programmes which have a one-tier system. The duration of these one-tier programmes is five years except for medicine which lasts six years. The qualifications in these one-tier programmes are equivalent to the first cycle (bachelor degree) plus secondary cycle (master degree) degree. Undergraduate level of study consists of short cycle (associate degree) - (önlisans derecesi) and first cycle (bachelor degree) - (lisans derecesi) degrees which are awarded after the successful completion of full-time two-year and four-year study programmes, respectively.

Graduate level of study consists of second cycle (master degree) – (yüksek lisans derecesi) and third cycle (doctorate) – (doktora derecesi) degree programmes. Second cycle is divided into two sub-types named as master without thesis and master with thesis. Master programmes without thesis consists of courses and semester project. The master programmes with a thesis consist of courses, a seminar, and a thesis. Third cycle (doctorate) degree programmes consist of completion of courses, passing a qualifying examination and a doctoral thesis. Specializations in dentistry, accepted as equivalent to third cycle programmes are carried out within the faculties of dentistry. Specialization in medicine, accepted as equivalent to third cycle programmes are carried out within the faculties of medicine, and university hospitals and training hospitals operated by the Ministry of Health.

Universities consist of graduate schools (institutes) offering second cycle (master degree) and third cycle (doctorate) degree programmes, faculties offering first cycle (bachelor degree) programmes, four-year higher schools offering first cycle (bachelor degree) degree programmes with a vocational emphasis and two-year vocational schools offering short cycle (associate degree) degree programmes of strictly vocational nature.

Second cycle degree holders may apply to third cycle programmes if their performance at the first cycle degree level is exceptionally high and their national central Graduate Education Entrance Examination (ALES) score is also high and their application is approved. The doctoral degree is conferred subject to at least one publication in a cited and refereed journal.

## GENERAL STRUCTURE OF THE NORTH CYPRUS EDUCATION SYSTEM



## **17.EMPLOYMENT OPPORTUNITIES FOR GRADUATES AND ACCESS TO GRADUATE PROGRAMS**

### **17.1. Employment opportunities**

Graduates of the Computer Engineering Program possess a strong foundation in both hardware and software engineering, enabling them to work in a wide range of sectors that rely on computer-based systems, information technologies, and digital innovation. Graduates of the Department of Computer Engineering have an opportunity to be employed as system engineers, computer engineers and specialists in this field, system programmers, design engineers, programmers, information technology specialists, communication network engineers, and in a variety of private and public establishments.

The Department of Computer Engineering has good relations with the governmental and private organizations and companies in North Cyprus and Turkey, thereby ensuring up to date study program in regard to scientific expertise and regional industrial needs. Curriculum of the department is kept up to date by offering new core/ elective courses upon the regional requirements, the demand of employers, international organizations and job market representatives.

The graduates can find the job in the governmental and private organizations and companies where they can work as

- Network systems and data communication analysts
- Software engineers
- Information technology specialists
- Computer hardware engineers
- Trainers for application support
- Assistants in high education units
- Cybersecurity engineer
- Engineer on Robotics and Automation
- Specialist on Artificial Intelligence and Machine Learning
- Specialist on Data Science and Big Data Analytics

The modules in the degree structure are also closely linked to the research conducted in the department and provide a path to post graduate studies. Moreover, a large majority of Bachelor's projects are completed in cooperation with industry in various projects either at the university or in companies, and thus provide a link to the professional field and a path to future employment in specialist tasks in these research areas.

Practical relevance of the program is achieved by:

- lectures given by professionals from various fields;
- laboratory lessons;
- renewing course contents periodically based on the job market needs;

- implementing new courses based on the job market needs;
- guest lecturers delivered by engineering practitioners;
- providing project based learning in courses with term projects;
- providing graduation projects that involve practical applications both in manufacturing and service sectors;
- organizing international and domestic academic seminars and workshops;
- a summer practice (internship) in order to integrate knowledge and theory to practice in the fields of Computer Engineering.

A summer practice is included in the Bachelor's degree. A summer practice is lasted 40 working days.

#### **17.2. Access to graduate programs**

Graduates of the Computer Engineering Program are well-prepared to pursue advanced studies and research at the graduate (Master's) levels, both in Türkiye and abroad.

Graduates may apply to Master's (MSc/ME) programs in Computer Engineering or related disciplines such as:

- Electrical and Electronics Engineering
- Software Engineering
- Information Systems
- Artificial Intelligence and Data Science
- Cybersecurity
- Robotics and Control Systems
- Communication and Network Technologies

Admission is generally based on the ALES (Academic Personnel and Graduate Education Entrance Exam- for students from Türkiye) score, undergraduate GPA, foreign language proficiency (YDS, TOEFL, or equivalent), and departmental interview performance, in accordance with the regulations of the Council of Higher Education (**YÖK/ YÖDAK**) and the respective university's graduate school.

Graduates can continue their education at foreign universities through international scholarship and exchange opportunities, participate in joint or dual-degree graduate programs offered in cooperation with partner universities abroad. Many graduates successfully pursue Master's and Ph.D. degrees in internationally recognized institutions, in particularly Europe, North America and Asia.