BSc. program, Electrical & Electronic Engineering Department

Course Unit Title	Image Processing
Course Unit Code	EE 463
Type of Course Unit	Elective Course
Level of Course Unit	First Cycle
National Credits	3
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	4
Practice (hour/week)	-
Laboratory (hour/week)	1
Year of Study	4
Semester when the course unit is delivered	Fall/Spring
Course Coordinator	Assist. Prof. Dr. Kamil Dimililer
Name of Lecturer (s)	Assist. Prof. Dr. Kamil Dimililer
Name of Assistant (s)	Buse Uğur
Mode of Delivery	Face to Face
Language of Instruction	English
Prerequisites	EE 341 Signal Processing
Recommended Optional Programme Components	

Course description:

Discrete-time signals and systems. Realization of discrete-time systems. Discrete Fourier transform. FIR and IIR filters. Cyclic limit. Synthesis of filters. Bilateral transform. Windowing. Image processing techniques. Image recognition. Noise sensitivity and scaling. Edge detection.

Objectives of the Course:

- Teaching the basics of image processing
- To illustrate the basic applications of image processing using Matlab.
- To give the principles of image enhancement approaches

At the end of the course the student should be able to		Assessment
1	Analyze theoretical and practical basics of image processing	1
2	To write programs for image processing applications using Matlab	2,5
3	Develop real life applications of image processing	2,3,5

Assessment Methods: 1. Written Exam, 2. Assignment, 3. Project/Report, 4. Presentation, 5. Lab. Work

Course's Contribution to Program		
		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	3
2	An ability to analyze a problem, identify and define the computing requirements appropriate to its solution	5
3	An ability to apply mathematical foundations, algorithmic principles, and computer engineering techniques in the modeling and design of computer-based systems	4
4	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social aspects	-
5	Planning and carrying out experiments, as well as to analyze and interpret data	4
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	5
7	An understanding of professional, ethical, legal, security and social issues and responsibilities that apply to engineering.	3
8	An ability to work productively in a multidisciplinary team, in particular to carry out projects involving computer engineering skills.	4
9	An ability to communicate effectively with a range of audiences	1
10	A recognition of the need for, and an ability to engage in life-long learning	5
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents			
Week	Chapter	Topics	Exam
1		Introduction	
2		Discrete-time signals and systems	
3		Discrete-time signals and systems	
4		Image Acquisition, Image Sampling and Quantization	
5		Point, Local and Global Operations	
6		Introduction to Image Enhancement	
7		Image Enhancement Applications	
8			Midterm
9		Image Enhancement Applications	
10		Basics of Image Binarization	
11		Applications of Image Binarization	
12		Introduction to Morphological Image Processing	
13		Introduction to Morphological Image Processing	
14		Examples, Review of the Semester	
15		Examples, Review of the Semester	
16			Final

Recommended Sources

Textbook:

Digital Image Processing by Gonzalez and Woods, A Simplified Approach to Image Processing by Randy Crane.

Lab Manual:

Supplementary Course Material

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Assessment

Attendance	-	
Assignments	5%	
Lab	20%	Lab Attendance, Lab Performance, Assignments
Midterm Exam	25%	Written Exam
Final Exam	50%	Written Exam
Total	100%	

Assessment Criteria

Final grades are determined according to the Near East University Academic Regulations for Undergraduate Studies

Course Policies

1. Attendance to the course is necessary but not mandatory.
2. Late assignments will not be accepted unless an agreement is reached with the lecturer.
3. Cell phones and computers must be switched off during the exam.
4. Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Near East University General Student Discipline Regulations.
5. Attacks performed against University/lecturer resources are expressly prohibited.

ECTS allocated based on Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including Exam weeks)	16	4	64
Labs and Tutorials	20	1	20
Assignment	2	4	8
Project/Presentation/Report	-	-	-
E-learning activities	-	-	-
Quizzes	-	-	-
Midterm Examination Study	1	10	10
Final Examination Study	1	21	21
Self Study	14	4	56
Total Workload			179
Total Workload/30(h)			5.97
ECTS Credit of the Course			6