MSc program, Biomedical Engineering Department

Course Unit Title	Advanced Applied Mathematics for Engineers
Course Unit Code	MAT501
Type of Course Unit	Elective
Level of Course Unit	Master of Science
National Credits	3
Number of ECTS Credits Allocated	10
Theoretical (hour/week)	4
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	-
Semester when the course unit is delivered	-
Course Coordinator	Assist. Prof. Dr. Hüseyin Çamur
Name of Lecturer (s)	Assist. Prof. Dr. Hüseyin Çamur
Name of Assistant (s)	-
Mode of Delivery	Face to Face.
Language of Instruction	English
Prerequisites	-
Recommended Optional Programme Components	-

Course description:

This course aims to review of vector analysis, complex numbers, review of ordinary differential equations, variation of parameters and Cauchy-Euler differential equations, system of linear differential equations. Laplace Transforms and Fourier series, beta gamma functions, bessel2s functions and partial differential equations.

Objectives of the Course:

To provide the students with an understanding of critical evaluation of scientific literature and scientific and engineering research and development in this field, as well as the skills required to present and support their findings.

Learning Outcomes

At the end of the course the student should be able to		Assessment
1	Apply the principles of Integral Calculus to solve a variety of practical problems in Engineering and Applied science	1
2	Express Complex Numbers in Cartesian, Polar, Trigonometric, Exponential and Logarithmic form, and use the theory of complex numbers to solve various practical problems in Engineering and Applied science	1, 2

3	Applied the theory of first and Second Order Differential Equations to solve various practical problems involving the Kinematics and Kinetics of Resisted Gravitational, Simple Harmonic and Vibratory Motion	1, 2
4	Describe and represent graphically statistical data in terms of measures of Central Tendency and measures of Dispersion	1, 2
5	Use a variety of Matrix and Numerical methods, including the use of appropriate computer software to solve Systems of Equations.	1,2

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

Course's Contribution to Program

		CL
1	Apply the rules of scientific research and ethics	3
2	Discuss complex biomedical engineering issues as well as own research results comprehensively and in the context of current international research and present these in writing and orally	2
3	Solve problems by systems analytical thinking both in subject specific and interdisciplinary concepts	2
4	Combine specialized knowledge of various component disciplines	2
5	Carry out in dependent scientific work and organize (capacity of teamwork), Conduct and lead more complex projects	2
6	To assess the social and environment-related effects of their actions	2

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Assessment
1		Introduction	
2		Binary Image analysis	
3		Pattern recognition concept	
4		Filtering and enhancing images	
5		Color, shading and texture	

6		Content-based image retrieval	
7		EXAM	
8		Motion from 2 D image sequence	
9		Image segmentation	
10		Perceiving 3 D from 2 D	
11		Virtual Reality	
12		Integration of machine vision system	
13		Review	
14		FINAL EXAM	Final Exam.
15			

Recommended Sources

Textbook:

Lecture Notes

Assessment

Project	15%	
Midterm Exam	30%	Written Exam
Final Exam	50%	Written Exam
Attendance	5%	
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 mandatory.
2. Late assignments will not be accepted unless an agreement is reached with the lecturer.
3. Students may use calculators 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

ECTS allocated based on Student Workload

Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including Exam weeks)	15	4	60
Labs and Tutorials	10	10	100
Assignment	-	-	-
Project/Presentation/Report	-	-	-
E-learning activities	-	-	-
Quizzes	-	-	-
Midterm Examination	1	6	6
Final Examination	1	12	12
Self Study	15	7	105
Total Workload			297
Total Workload/30(h)			9.78
ECTS Credit of the Course			10