

## MSc Program, Biomedical Engineering Department

<b>Course Unit Title</b>	Advanced Microprocessors
<b>Course Unit Code</b>	BME534
<b>Type of Course Unit</b>	Elective
<b>Level of Course Unit</b>	Master of Science
<b>National Credits</b>	3
<b>Number of ECTS Credits Allocated</b>	10
<b>Theoretical (hour/week)</b>	4
<b>Practice (hour/week)</b>	-
<b>Laboratory (hour/week)</b>	-
<b>Year of Study</b>	-
<b>Semester when the course unit is delivered</b>	-
<b>Course Coordinator</b>	Assist. Prof. Dr. Kaan Uyar
<b>Name of Lecturer (s)</b>	Assist. Prof. Dr. Kaan Uyar
<b>Name of Assistant (s)</b>	-
<b>Mode of Delivery</b>	Face to Face.
<b>Language of Instruction</b>	English
<b>Prerequisites</b>	-
<b>Recommended Optional Programme Components</b>	-
<b>Course description:</b>	
Introduction to microprocessors, Architecture of 8-bit microprocessors, PIC microcontroller code sets, Introduction to microprocessor programming, PIC16 and PIC18 series, Advance system design of microprocessors, Connections of microprocessors, memory, input-output and cutting, timing circuits.	
<b>Objectives of the Course:</b>	
In this course students will study the microcontroller hardware structure, programming and design applications.	

<b>Learning Outcomes</b>			
At the end of the course the student should be able to			Assessment
1	describe the microcontrollers and know the basics of microcontroller programming		1,2
2	design applications using microcontroller units		1,2,3,4,5
3	present group project		3,4
Assessment Methods: 1. Written Exam, 2. Assignment, 3. Project/Report, 4. Presentation, 5. Lab. Work			
<b>Course's Contribution to Program</b>			
			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		3
3	Solve problems by systems analytical thinking both in subject specific and interdisciplinary concepts		3
4	Combine specialized knowledge of various component disciplines		4
5	Carry out in dependent scientific work and organize (capacity of teamwork), Conduct and lead more complex projects		5
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)			
<b>Course Contents</b>			
Week	Chapter	Topics	Assessment
1		Introduction to microcontrollers	
2		Instruction Set	
3		Instruction Set	
4		Instruction Set, Assembly program writing, Compilers	
5		Memory	

6		I/O, ADC, DAC, opamp	
7		Interrupts, Digital I/O, LCD, Timers	
8		Midterm exam	
9		Applications	
10		Applications	
11		Applications	
12		Applications	
13		Applications	
14		Applications	
15		Representations, Review	
16		Final Exam	

### Recommended Sources

1. Dogan Ibrahim, "Design of a microcontroller based portable ecg unit with graphical LCD: Design of a microcontroller based ECG unit", LAP LAMBERT Academic Publishing, 2012
2. Dogan Ibrahim , Nevzat Ozyurtlu, "Design of a Microcontroller Based Uroflowmetry Device: Microcontroller Based Uroflowmetry Device Design", LAP LAMBERT Academic Publishing, 2014
3. Dogan Ibrahim, "SD Card Projects Using the PIC Microcontroller", Newnes, 2010

### Assessment

Project	30%	
Assignments	20%	
Midterm Exam	20%	Written Exam
Final Exam	30%	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 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)	16	4	64
Labs and Tutorials	6	1	6
Assignment	2	15	30
Project/Presentation/Report	1	40	40
E-learning activities			
Quizzes			
Midterm Examination	1	16	16
Final Examination	1	28	28
Self Study	14	8	112
Total Workload			296
Total Workload/30(h)			9.87
ECTS Credit of the Course			10