

Course Unit Title	Biomedical Instrumentation II	
Course Unit Code	BME312	
Type of Course Unit	Compulsory	
Level of Course Unit	3 rd year BSc program	
National Credits	4	
Number of ECTS Credits Allocated	6	
Theoretical (hour/week)	4	
Practice (hour/week)	-	
Laboratory (hour/week)	-	
Year of Study	3	
Semester when the course unit is delivered	6	
Course Coordinator	Ali Işın	
Name of Lecturer (s)	Ali Işın	
Name of Assistant (s)	-	
Mode of Delivery	Face to Face.	
Language of Instruction	English	
Prerequisites	BME311, (BIOMEDICAL INSTRUMENTATION I)	
Recommended Optional Programme Components		
Course description:		
This course is designed for biomedical engineering undergraduate students. The purpose of the course is to provide biomedical instrumentation background on technical aspects. Biomedical measurement systems are introduced in detail. Students are provided with overviews of the major physical techniques that engineers have used to explore in biomedical engineering levels.		
Objectives of the Course:		
<ul style="list-style-type: none"> • With widespread use and requirements of medical instruments, this course gives knowledge of the principle of operation and design of biomedical instruments. • It attempts to render a broad and modern account of biomedical instruments. • It gives the introductory idea about human physiology system which is very important with respect to design consideration. 		
Learning Outcomes		
At the end of the course the student should be able to		Assessment
1	Develop a thorough understanding on basics of biomedical amplifiers	1
2	Develop a thorough understanding on basics of biomedical measurements	1, 2
3	Develop a thorough understanding on principles of medical instrumentations	1, 2
4	Develop a thorough understanding on clinical applications of medical instrumentation systems.	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 knowledge of mathematics, natural science with relevant to life science and multidisciplinary context of engineering science.	
2	Analyse, design and conduct experiments, as well as to analyse and interpret	

	data.	
3	Design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.	
4	Function on multidisciplinary teams.	
5	Control in design work, by using simulation, modelling and tests and integration in a problem solving oriented way.	
6	Display an understanding of professional and ethical responsibility.	
7	Communicate effectively aware of the non-technical effects of engineering.	
8	Search technical literature and other information sources.	
9	Recognize of the need for, and an ability to engage in life-long learning.	
10	Exhibit a knowledge of contemporary issues.	
11	Use the techniques, skills and modern engineering tools necessary for engineering practice to develop marketable products for the global market.	
CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)		

Course Contents

Week	Chapter	Topics	Assessment
1		Introduction	
2		Cardiac Pacemakers	
3		Implantable Defibrillators	
4		Blood Pumps	
5		Measurement of Flow and Volume of Blood	
6		Photoplethysmogram	
7		Therapeutic and Prosthetic Devices	
8		Midterm	Midterm
9		Clinical Laboratory Instrumentation	
10		Intensive Care and Coronary Care Units	
11		Electricosurgical Devices	
12		Implantable Stimulators for Neuromuscular Control	
13		EMG & EEG Systems	
14		Revision Week	
15			Final Exam.

Recommended Sources

Textbook:

20. J.J. Carr, J.M. Brown: Introduction to Biomedical Equipment Technology, Prentice Hall, 2nd Ed. 2001.

21 J.G Webster: Medical Instrumentation: Application and design, Wiley, 2010.

Assessment

Attendance	5%		
Lab	20%		
Midterm Exam	30%	Written Exam	
Final Exam	45%	Written Exam	
Total	100%		
Assessment Criteria			
Final grades are determined according to the Near East University Academic Regulations for Undergraduate Studies			
Course Policies			
<ol style="list-style-type: none"> 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	-	-	-
Assignment	11	2	22
Project/Presentation/Report	-	-	-
E-learning activities	5	2	10
Quizzes	-	-	-
Midterm Examination	1	2	2
Final Examination	1	2	2
Self-Study	15	5	75
Total Workload			171
Total Workload/30(h)			5.71
ECTS Credit of the Course			6