Course Unit Title	Instrumental Analysis
Course Unit Code	BME401
Type of Course Unit	Compulsory
Level of Course Unit	
National Credits	4
Number of ECTS Credits Allocated	6
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	2
Year of Study	1
Semester when the course unit is delivered	2
Course Coordinator	-
Name of Lecturer (s)	
Name of Assistant (s)	-
Mode of Delivery	Face to Face.
Language of Instruction	English
Prerequisites	-
Recommended Optional Programme Components	

Course description:

This course is designed to give students practical experience using modern analytical instrumentation and to provide students with the background theory and principles of operation.

Objectives of the Course:

- The objective of this course is to provide a fundamental understanding of various analysis tools and instruments in biomedical applications.

Learning Outcomes

At the end of the course the student should be able to		Assessment
1	The chemical and physical principles exploited during the measurement.	1, 2, 3,4,5
2	How the instrument actually makes the measurement.	1, 2, 3,4,5
3	Some of the technique used to increase the accuracy, precision and sensitivity.	1, 2, 3,4,5
4	Learn the basic principles and differences of various temperature sensors.	1,2,3,4,5
5	Develop good manipulation skills	
6	Students will be able to understand and operate a wide range of instruments based on the knowledge.	
	Following new innovations	4, 5

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.	5
2	Analyze, design and conduct experiments, as well as to analyze and interpret data.	5
3	Design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health	5

	and safety, manufacturability and sustainability.	
4	Function on multidisciplinary teams.	5
5	Control in design work, by using simulation, modelling and tests and integration in a problem solving oriented way.	5
6	Display an understanding of professional and ethical responsibility.	5
7	Communicate effectively aware of the non-technical effects of engineering.	5
8	Search technical literature and other information sources.	5
9	Recognize of the need for, and an ability to engage in life-long learning.	5
10	Exhibit a knowledge of contemporary issues.	5
11	Use the techniques, skills and modern engineering tools necessary for engineering practice to develop marketable products for the global market.	5

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

Course Contents

Week	Chapter	Topics	Assessment
1		Inroduction to Instrumental analysis	
2		Introduction to spectroscopy	
3		UV_Visible Spectroscopy	
4		Luminescence Spectroscopy	Assignment 1
5		Infrared Spectroscopy	
6		Introduction to Atomic Spectroscopy	Assignment 2
7		Atomic Emmision/Absorption Spectroscopy	
8		Midterm	Midterm Exam
9		Potentiometry/Voltammetry	
10		Continuous Flow and Flow Injection Analysis	
11		Gas Chromotography	
12		High Performance Liquid Chromatography	Assignment 3
13		Electrophoresis	
14		Mass Spectrometry	
15		Revision	
16		FINAL EXAM	Final Exam.

Recommended Sources

Textbook:

Holler, Skoog, Crouch, Principles of Instrumental Analysis, 6th Edition, ISBN-13: 978-0-495-01201-6, 2007, Cengage Learning.

Lab Manual

Supplementary Course Material

- Related Research Papers

Assessment		
Attendance	5%	Less than 25% class attendance results in NA grade
Assignment	5%	
Midterm Exam	30%	Written Exam
Quiz	15%	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

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	20	1	20
Assignment	2	4	8
Project/Presentation/Report	3	10	30
E-learning activities	-	-	-
Quizzes	-	-	-
Midterm Examination	-	-	-
Final Examination	1	2	2
Self Study	15	4	100
Total Workload			162
Total Workload/30(h)			5.5
ECTS Credit of the Course			6