ABDULLAH GUL UNIVERSITY
GRADUATE SCHOOL OF ENGINEERING & SCIENCE
BIOENGINEERING DEPARTMENT
COURSE DESCRIPTION AND SYLLABUS

Course Name	CODE	SEMESTER	T+L Hour	CREDIT	ECST
Instrumental Analysis	525	FALL-SPRING	3 + 0	3	10

Prerequisite Courses	-

Course Type	Elective
Course Language	English
Course Coordinator	Asst. Prof. Dr. İsmail Alper İşoğlu
Lecturers	Dr. İsmail Alper İşoğlu, Dr. Sevil Dinçer İşoğlu, Dr. Erkin Aydın, Dr, Aysun Aydın, Dr. Aysun Adan, Dr. Mona El-Khatib, Dr. Sebiha Ç. Kaplan
Course Assistants	Res. Asst. Yağmur Kiraz
Course Objectives	General introduction about devices that are used in chemical analysis.
Learning Outcomes	Students, • Able to understand devices that are used in chemical anlaysis • Able to learn principles of chemical mesaurements • Able to gain a different point of view on solving problems based on devices •
Course Content	Separation methods, Chromatographic techniques, spectrophotometric analysis, spectroscopy tpyes

WEEKLY SUBJECTS AND RELATED PRELIMINARY PAGES

Week	Subjects	Preliminary
1	Introduction, chemical analysis and the role of devices	Course book, Introduction part and related articles
2	Separation methods	Course book, Introduction part and related articles
3	Chromatographic techniques: HPLC	Course book, Introduction part and related articles
4	Chromatographic techniques: LC, GPC	Course book, Introduction part and related articles
5	Spectroscopy: mass spectroscopy	Course book, Introduction part and related articles
6	Spectroscopy: IR spectroscopy	Course book, part A and related articles
7	Spectroscopy: NMR spectroscopy	Course book, part B and related articles
8	Spectroscopy: atomic absorption spectroscopy	Course book, part H,I and related articles
9	Fluorescence and raman spectroscopy	Related articles
10	Midterm	Course notes and book
11	X-ray spectroscopy,ESCA	Course book, part N and related articles
12	Visualization methods: Optical microscopy	Course book, part N and related articles
13	Visualization methods:SEM	Course book, part Q and related articles
14	Visualization methods:AFM	Related articles
15	Sensors: QCM, SPR	Related articles
16	Final	Couse notes and book

RESOURCES

Course Notes	Related course notes and slides
Other Resources	D.A. Skoog, F.J. Holler and S.R. Crouch, Principles of Instrumental Analysis, 6th Edition, Thomson Brooks/Cole Publishers, 2007.

MATERIAL SHARING	
Documents	Related course notes and slides
Homework	One assignment about related chapter of this course per week
Exams	One midterm and one final

RATING SYSTEM		
SEMESTER WORKS	**NUMBER**	**CONTRIBUTION**
Midterm	1	20
Homework and quiz	14	25
TOTAL		70
Success Rate of Semester		70
Success Rate of Final	1	30
TOTAL		100

Course Category	
Basic Sciences and Mathematics	50%
Engineering Sciences	50%
Social Sciences	0%

THE RELATIONSHIP BETWEEN THE LEARNING OUTCOMES AND PROGRAM COMPETENCE

No	Program Outcomes	Contribution Level				
		1	2	3	4	5
1	Understanding of Life Sciences, Mathematics and Engineering at the post-graduate level, and being able to implement of this knowledge into bioengineering problems					x
2	Having the ability of developing a new scientific method or a technological product or process, and, designing experiments, implementing, collecting data and evaluating regarding these issues					x
3	Choosing technical equipment used in the applications related to bioengineering, having sufficient knowledge in adopting and using new technological equipment					x
4	Having the ability of reaching the information, using resources, contributing to the literature by transferring the process and results of scientific studies as written or verbally in the national and international environments					x
5	Having the ability of working as an individual or a team, in the teams composed of discipline or different disciplines, gaining awareness of leadership and taking responsibility				x	
6	Having advanced level of foreign language knowledge to manage efficient verbal, written and visual communication in the major field				x	
7	Having the understanding of ethics in science and the responsibility in profession with the awareness of lifelong learning, being beneficial to society and sensitiveness to global issues				x	
8	Being aware of the social impacts of the solutions and applications of the challenges regarding Bioengineering				x	

*From 1 to 5, it increasingly goes.

ECTS / WORK-LOAD TABLE			
Activities	Activities	Duration (Hour)	Total (Work-Load)
Course Duration (Including exam week: 16x total course hour)	16	3	48
Out of Class Exercise Time (Pre-study, reinforcement)	16	7	112
Reading	16	3	48
Searching on Internet, library study	5	3	15
Presentation	5	3	15
Homework	16	3	48
Midterms	1	15	15
Final	1	15	15
Total Work-Load			301
Total Work-Load / 30			301/30
Course ECTS Credit			10