



YOZGAT BOZOK UNIVERSITY FACULTY OF ARTS AND SCIENCES
CHEMISTRY DEPARTMENT COURSE PLAN

Course Code	Course Title	Semester	Course Type (C/E)	T+A+L (Time/Week)	Credit	ECTS	Course Language
KİM732	Molecular Spectroscopy	1-2	E	2+0+0	1	4	Turkish

COURSE INFORMATION

Course Catalog Description (Content)	It includes the theories and application areas of spectroscopic methods, which are widely used in quantitative and qualitative molecular analysis.
The Aim of the Course	To teach the scientific and technological principles and application areas of many molecular spectroscopic methods, which are widely used in laboratories for substance detection, structure illumination, quantification, research, etc. in many fields such as science, industry, medicine, criminology. To establish the basis for new spectroscopic methods that are constantly developing with technology.
Course Level	Bachelor degree
Course Language	Turkish
Teaching method	(X) Formal () Online () Mixed/Hybrid
Teaching Staff of the Course	Prof. Dr. Mustafa SAÇMACI
Prerequisite Course(s) of the Course	
Learning Outcomes from the Course	<ol style="list-style-type: none">1. Learns the basic physical and chemical principles on which molecular spectroscopic analysis methods are based.2. Learns to establish the measurement systems used by these methods and their correlation with the qualitative and quantitative properties of the molecule.3. Learns the effects and importance of the characteristics of some parts of the devices on the analysis results. With this information, they have information about how device and equipment selections should be made.4. Learns the general properties of spectroscopic analysis outputs (graphs, spectra, etc.) and how to use them.5. She/he can choose the most appropriate method in item analysis with the knowledge she has acquired about the application areas of each method described.

COURSE CONTENT

Week	Theory	Practice/Laboratory
1	Information about the introduction of the course, its operation, etc. Overview of instrumental analysis methods and spectroscopic methods and molecular spectroscopic methods.	
2	Matter-energy interactions, electromagnetic spectrum, matter-light interactions, which form the basis of spectroscopy, and improved analysis methods for each of these interactions.	
3	Relationships between electromagnetic waves absorbed and emitted by matter and its molecular structure, absorption, emission spectra, measurements and evaluation	
4	UV-VIS absorption spectroscopy, its applications and areas of use.	
5	IR absorption spectroscopy, its applications and areas of use.	

6	Raman spectroscopy, its applications and uses	
7	Molecular luminescence spectroscopy, transitions between molecular energy levels (Jablonski diagram) and results	
8	Molecular fluorescence, phosphorescence and chemiluminescence spectroscopy, applications and uses	
9	Molecular Mass Spectroscopy, its applications and uses	
10	NMR spectroscopy, its applications and uses	
11	Combined Methods	
12	GC-MS Spectroscopy	
13	LC-MS Spectroscopy	
14	General repetition	
15	Final Exam	

Course Learning Resources

1. Principles of Instrumental Analysis, Skoog, West, Holler, Translation, Bilim Publishing, Ankara, 2002
2. Instrumental Analysis, T. Gündüz, Ankara University. Publications, Ankara, 2003
3. Instrumental Analysis Methods, A. Yıldız, Ö. Genç, S. Bektaş Hacettepe University Press, Ankara,
4. Spectroscopic Methods in Organic Chemistry, E. Erdik, (1993)., Ankara: Gazi Büro Kitapevi
5. All Instrumental Analysis Books and Scientific Internet Sites
6. Quantitative Chemical Analysis (Chapter: 19-26), Daniel C. Harris, Translation, Palme Publishing, Ankara 2015

ASSESSMENT CRITERIA

Work Activities During the Semester	Number	Contribution
Homework	1	%30
Practice		
Forum/ Discussion Application		
Short Exam (Quiz)	2	%35
Ratio Of Semester Studies To Semester Success (%)		%40
Ratio of Final to Success (%)	1	%60
Total		%100

COURSE WORKLOAD TABLE

Activity	Total Weeks	Duration (Weekly Hours)	Total Workload
Theory	14	2	28
Practice			
Forum/ Discussion Application			
Reading	14	3	42
Internet Scanning, Library Study	14	2	28
Material Design, Application			
Report Preparation			
Presentation Preparation			
Presentation			
Final Exam	1	2	2
Preparation for the Final Exam	4	6	24
Other(s) (Specify:)			
Total Workload			

Total Workload / 25 (s)		124/25				
ECTS Credits of the Course		124/25 \cong 5				
Note: The workload of the course will be determined by the instructor on a per-course basis.						
PROGRAM LEARNING OUTPUTS CONTRIBUTION LEVELS						
No	Program Learning Outputs	1	2	3	4	5
1	Gains extensive knowledge about the basic chemical properties of matter and uses this knowledge in daily life, industrial scale, and practical chemistry and shares them with the society.				X	
2	Performs experiments, collects data, interprets, evaluates results, defines problems parallel to current technological developments, produces solutions against problems encountered in the laboratory.		X			
3	Calculates and processes chemical information and data.			X		
4	Applies her/his knowledge and understanding of chemistry to the solution of unconventional qualitative and quantitative problems.				X	
5	Defines and comprehends chemical concepts and theories in Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Analytical Chemistry, Biochemistry.				X	
6	Can conduct research in the light of scientific data on any subject in the field of chemistry.					X
7	Writes, presents, discusses scientific material, and presents it orally to a knowledgeable audience.			X		
8	Brings a chemical approach to the solution of environmental problems, makes environmental analyzes and reports.		X			
9	Knows a foreign language at a level to read and understand the basic terms and processes of the chemist profession.			X		
10	Can use computer software and information and communication technologies at the level required by the field.				X	
11	Adapts and transfers the knowledge gained in the field to secondary education.			X		
12	Apart from the field of chemistry, she/he gains knowledge in different branches of science that she feels close to.				X	
13	Carries out a study independently, makes group work and gains the awareness of taking responsibility.				X	
14	They can develop a positive attitude towards lifelong learning and constantly renew their professional knowledge and skills.				X	
15	Have sufficient awareness of the universality of social rights, social justice, quality culture and protection of cultural values, environmental protection, occupational health and safety.			X		