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
KİM736	Peptide Chemistry and Metabolism	1-2	E	2+0+0		5	Turkish

COURSE INFORMATION

Course Catalog Description (Content)	This course covers the general chemical structure of peptides and proteins starting from amino acids, the synthesis, purification and characterization of peptides by various methods, and the use of peptides in the fields of medicine, tissue engineering and biomaterialsç
The Aim of the Course	In this course, it is aimed that the participants learn the basics of peptide chemistry and gain knowledge about current research in these fields.
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	**1.** The general chemical structure of amino acids and their chemical properties and reactivities arising from this structure are learned. **2.** A general overview of the chemical reactions of amino acids is builded so that a synthetic background is created for the topics to be discussed in the coming weeks **3.** Structural features, common points and differences of peptides and proteins are learned. **4.** It is learned how changes in the structural properties of peptides and proteins can affect their functions. **5.** The history of peptide synthesis, its importance and general protocols to be followed during synthesis are learned **6.** The properties of the reagents to be used in each step during peptide synthesis are known and the students gain the foresight to choose the appropriate reagent accordingly. **7.** Learn the basic principles of reversed phase high performance liquid chromatography and how to purify peptides using this analytical method. **8.** Characterization of peptides using some methods such as LC-MS and MALDI will be learned. **9.** The student understands and interprets research activities related to peptide-based biomaterials, drug release, targeting strategies, and can make proposals for projects.

COURSE CONTENT

Week	Theory	Practice/Laboratory
1	Amino acids: chemical properties, nomenclature, synthetic amino acids	
2	Peptides, polypeptides and proteins	
3	Historical development of peptide synthesis, current synthesis methods	
4	Overview of solid phase peptide synthesis and classical solution phase peptide synthesis methods	
5	Solid phase peptide synthesis essential reagents: solvents and resin types	

6	Solid phase peptide synthesis essential reagents: protected amino acid derivatives	
7	Solid phase peptide synthesis basic reagents: types of coupling reagents	
8	Difficult peptide sequences	
9	Purification of peptides by chromatographic methods	
10	Characterization of peptides	
11	Cell-penetrating peptides	
12	Targeting peptide ligands	
13	Peptide hydrogels and their use as biomaterials	
14	Use of peptides as drug delivery systems	
15	Final Exam	

Course Learning Resources

1. 1. Published theses and articles related to peptides.
2. 2. Fmoc Solid Phase Peptide Synthesis: A Practical Approach. by W. C. Chan (Editor), Peter D. White (Editor)
3. 3. Lecture notes of the lecturer,
4. 4. Internet resources

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≅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**		