

BALIKESİR UNIVERSITY
FACULTY OF SCIENCES AND LITERATURE

UNIVERSITY ELECTIVE COURSE INFORMATION FORM

Department / Division	Chemistry / Biochemistry					
Course Title	Chemistry of Life					
Semester	Fall : X			Spring		
Language of Instruction	Turkish : X			English		
Course Credits	Theoretical : 2		Practical : -		Total Credits : 2	
ECTS Credits	3					
Mode of Study	Formal Education					
Course Objective	This course aims to introduce chemical processes in living systems within the context of daily life, health, and environment, and to develop students' scientific thinking and interpretation skills.					
Course Content	This course examines the fundamental chemical processes occurring in living systems through an interdisciplinary perspective. The structure and organization of the cell, the structure and functions of biomolecules (proteins, carbohydrates, lipids, and nucleic acids), enzyme mechanisms, and metabolic pathways are covered. Energy production and transformation, the chemical basis of nutrition, vitamins, and biologically important molecules are discussed to explain the chemical basis of health and disease. Current topics such as aging, oxidative stress, and biotechnological applications are also included, enabling students to relate biochemical processes to everyday life.					
Prerequisites	-					
Instructor(s)	Doç. Dr. Adem Ergün			mail : ademergun@balikesir.edu.tr		
Teaching Assistants	-			-		
Internship Status	-					
Course Resources	Biochemistry – Berg, Tymoczko, Stryer Lehninger Principles of Biochemistry Introduction to Biological Chemistry					
Course Structure	Natural Sciences					
Planned Learning Activities and Methods	The course is delivered through lectures supported by visual presentations and interactive discussions. Topics are presented by linking them with real-life examples and current scientific developments. To enhance student engagement, in-class discussions, question–answer sessions, and case study analyses are conducted. Current scientific articles and popular science resources may be used when necessary. Short presentations or individual assignments may be given to improve research and analytical thinking skills. Conceptual understanding is supported through schematic representations, animations, and digital learning materials.					
Assessment Methods			Course ECTS Workload Calculation Content			
Semester Activities	Number	Contribution (%)	Activity	Number	Duration	Total Workload (Hours)
Midterm Exam	1	40	Course Hours	14	2	28
Quiz			Out-of-Class Study	14	2	28

Assignment			Midterm Exams	1	2	2
Attendance			Final Exam	1	2	2
Practical			Total Workload: 60 hours			
Project			ECTS Credits: 3			
Final Exam	1	60				

Learning Outcomes	Upon successful completion of this course, students will be able to:					
	1.	Explain basic chemical processes in living systems				
	2.	Interpret structure and function of biomolecules				
	3.	Explain the role of enzymes				
	4.	Evaluate metabolism and energy relationships				
	5.	Analyze connections between nutrition, health, and chemistry				
	6.	Interpret current developments in biochemistry				

Course Topics

Week	Topic	Preparation	Documents
1	What is life? Why is chemistry the basis of life		
2	Cell as a chemical system		
3	Biomolecules: proteins, carbohydrates, lipids		
4	DNA and chemistry of genetic information		
5	Proteins and structure–function relationships		
6	Enzymes: biological catalysts		
7	Metabolism and energy production		
8	Nutrition and chemistry		
9	Vitamins and minerals		
10	Chemistry of drugs		
11	Chemical basis of diseases		
12	Aging and oxidative stress		
13	Biotechnology and modern applications		
14	Current developments and general evaluation		

Contribution to Program Outcomes	This course contributes to the development of an interdisciplinary perspective by enabling students to understand life processes through their chemical foundations. Students gain not only theoretical knowledge but also develop analytical and critical thinking skills, scientific literacy, problem-solving, and interpretation abilities.					
	The course enhances students' ability to relate biochemical processes to daily life, health, and the environment, thereby strengthening their understanding of the relationship between science and society. It also supports independent learning and improves skills in evaluating scientific data and communication. In this context, the course contributes at a moderate to high level to program outcomes, particularly in terms of scientific thinking, interdisciplinary approach, lifelong learning, and societal awareness.					