

BALIKESİR UNIVERSITY
FACULTY OF SCIENCES AND LITERATURE
UNIVERSITY ELECTIVE COURSE INFORMATION FORM

Department / Division	Chemistry / Biochemistry					
Course Title	Antioxidants					
Semester	Fall :			Spring:X		
Language of Instruction	Turkish : X			English		
Course Credits	Theoretical : 2		Practical : -		Total Credits : 2	
ECTS Credits	3					
Mode of Study	Formal Education					
Course Objective	The aim is to analyse the chemical and biochemical properties of antioxidants and free radicals, and to investigate their biocompatibility and key mechanisms of action.					
Course Content	This course will cover the biochemical properties of antioxidants and free radicals, as well as vitamins E and C, phenolic compounds, uric acid, carotenoids, the catalase enzyme, the superoxide dismutase enzyme, the glutathione peroxidase enzyme, the glutathione reductase enzyme and its antioxidant function.					
Prerequisites	-					
Instructor(s)	Prof. Dr. Nahit GENÇER			mail: ngencer@balikesir.edu.tr		
Teaching Assistants	-			-		
Internship Status	-					
Course Resources	The course instructor's prepared notes					
Course Structure	Natural Sciences					
Planned Learning Activities and Methods	Lecture (Presentation), Interactive Discussion, Question–Answer Method, Text and Source Analysis, Concept Mapping, Problem-Based Learning, Small Group Discussions, Short Written Assessments, Conceptual Inquiry and Critical Thinking					
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	Students who successfully complete this course will: 1. Understand the biochemical properties of antioxidants and free radicals, 2. Understand the biochemical properties of vitamins E and C					

3. The antioxidant functions of phenolic compounds, uric acid and carotenoids,
4. The antioxidant functions of the enzymes catalase, superoxide dismutase, glutathione peroxidase and glutathione reductase.

Course Topics

Week	Topic	Preparation	Documents
1	What is an Antioxidant?		
2	What are free radicals, how are they formed, and what harm do they cause?		
3	Vitamin E and its antioxidant function		
4	Vitamin C and its antioxidant function		
5	Phenolic compounds and their antioxidant function		
6	Uric acid and its antioxidant function		
7	Carotenoids and their antioxidant function		
8	The antioxidant enzyme catalase		
9	The antioxidant enzyme superoxide dismutase		
10	The antioxidant enzyme glutathione peroxidase		
11	The antioxidant enzyme glutathione reductase		
12	The antioxidant enzyme glutathione reductase S-transferase		
13	Health Benefits of Antioxidants		
14	Experimental Studies Conducted		

Contribution to Program Outcomes

This course contributes to the development of students' interdisciplinary perspectives and strengthens their scientific thinking skills. The course not only enables students to acquire knowledge but also contributes at a moderate and high level to program outcomes by enhancing:

- Analytical and Critical Thinking Skills
- Scientific Literacy
- Interdisciplinary Approach
- Problem-Solving and Interpretation Skills
- Communication and Discussion Skills
- Independent Learning Competence
- Understanding the Relationship Between Science and Society