

REACTIVE OXYGEN SPECIES AND ANTIOXIDANTS

1	Course Title:	REACTIVE OXYGEN SPECIES AND ANTIOXIDANTS	
2	Course Code:	VFZ6034	
3	Type of Course:	Optional	
4	Level of Course:	Third Cycle	
5	Year of Study:	1	
6	Semester:	2	
7	ECTS Credits Allocated:	2.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:		
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. NURTEN YAKAR	
15	Course Lecturers:	Prof. Dr. Nurten GALİP	
16	Contact information of the Course Coordinator:	Prof. Dr. Nurten GALİP nurteng@uludag.edu.tr +90 224 294 1273 Uludağ Üniversitesi Veteriner Fakültesi Fizyoloji ABD Görükle Bursa 16059	
17	Website:		
18	Objective of the Course:	To learn the importance of antioxidants in healthy life, prevention of diseases, delaying of aging,	
19	Contribution of the Course to Professional Development:	To increase the knowledge and experience of students about antioxidants.	
20	Learning Outcomes:		
		1	To be able to explain reactive oxygen species and source
		2	To be able to explain the effects of free oxygen radicals
		3	To be able to explain antioxidant defense systems against free radicals
		4	To be able to explain the positive effects created by probiotics
		5	To be able to explain the relationship between antioxidants and the aging process
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21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	
1	to explain reactive oxygen species name, and description		
2	to explain reactive oxygen species name, and description		

3	Source of reactive oxygen species (ROS) in the cell	
4	Effects of free oxygen radicals, (effects of radicals on lipids)	
5	Effects of free radicals on proteins	
6	Effects of free radicals on nucleic acids and DNA	
7	Effects of free radicals on carbohydrates	
8	The mechanism of action of probiotics	
9	Cellular defense against free radicals (antioxidant defense systems, antioxidants)	
10	Cellular defense against free radicals (antioxidant defense systems, antioxidants)	
11	Oxidative stress and aging research	
12	Oxidative stress and aging research	
13	Oxidative stress and aging research	
14	Oxidative stress and aging research	

22	Textbooks, References and/or Other Materials:	<p>- NOYAN, A. Yaşamda ve Hekimlikte Fizyoloji, Meteksan Ankara, 2005.</p> <p>GUYTON, A.C., HALL J.E.: Textbook of Medical Physiology, 11th Edition, W.B. Saunders Company, 2005.</p> <p>REECE, W.O: Dukes' Physiology of Domestic Animals, 12th Edition, Comstock Publishing, 2004.</p> <p>CUNNINGHAM JG. Textbook of Veterinary Physiology, Elsevier, USA, 2002</p> <p>YILMAZ, B.: Fizyoloji, Tuğra Ajans, Ankara, 2000.</p> <p>Mironczuk-Chodakowska, A. M. Witkowska, and M. E.Zujko, "Endogenous non-enzymatic antioxidants in the human body," Advances in Medical Sciences, vol. 63, no. 1, pp. 68–78, 2018.</p> <p>H. J. Forman, "Redox signaling: an evolution from free radicals to aging," Free Radical Biology & Medicine, vol. 97, pp. 398–407,2016.</p> <p>S. Losada-Barreiro and C. Bravo-Díaz, "Free radicals and polyphenols:the redox chemistry of neurodegenerative diseases,"European Journal of Medicinal Chemistry, vol. 133, pp. 379,2017</p> <p>Zerba E, Koncikowski TE, Faulkner JA. Free radical injury to skeletal muscles of young, adult, and old mice. Am J Physiol. 1990;258:C429–C35. [PubMed]</p> <p>Baraldi E, Dario C, Ongaro R, Scollo M, Azzolin NM, Panza N, Paganini N, Zacchello F Exhaled nitric oxide concentrations during treatment of wheezing exacerbation in infants and young children. Am J Respir Crit Care Med 1999 Apr;159(4 Pt 1):1284-8</p> <p>Burtis CA, Ashwood ER. Tietz Textbook of Clinical Chemistry. W.B. Saunders Company. Philadelphia, Pennsylvania. (1999).</p> <p>Dawn BM, Allan DM, Colleen MS. Basic Medical Biochemistry a Clinical Approach.Lippincott Williams & Wilkins. Baltimore, Maryland.(1996).</p>
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23	Assesment		
TERM LEARNING ACTIVITIES		NUMBE R	WEIGHT
Midterm Exam		1	30.00
Quiz		1	10.00

Home work-project	0	0.00
Final Exam	1	60.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		test exam

24 ECTS / WORK LOAD TABLE

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	2.00	28.00
Homeworks	0	0.00	0.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	0.00	0.00
Others	0	0.00	0.00
Final Exams	1	4.00	4.00
Total Work Load			60.00
Total work load/ 30 hr			2.00
ECTS Credit of the Course			2.00

25

CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS

	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	5	5	5	5	5	5	5	5	5	4	5	0	0	0	0
ÖK2	5	5	5	5	5	5	5	5	4	5	5	5	0	0	0	0
ÖK3	5	5	5	5	5	5	4	5	5	5	5	5	0	0	0	0
ÖK4	4	5	4	5	5	5	5	5	5	5	5	5	0	0	0	0
ÖK5	5	5	5	5	4	5	4	5	5	5	5	5	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	1 very low	2 low	3 Medium	4 High	5 Very High
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