



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Microscopy and Microscopic Technique							
Course Code		VHE602		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	4	Workload	100 (<i>Hours</i>)	Theory	1	Practice	2	Laboratory	0
Objectives of the Course		To teach the properties of light microscop, resolution, types and working principles of the light microscopes, electron microscopes, and provide information about the working principles. Sample preparation for electron microscopy. To teach the obtaining of the tissues, fixation process, the chemical properties of the fixatives, dehydration, clearing, infiltration, embedding, sectioning, staining procedures							
Course Content		Microscopes: Characteristics of the light microscope, resolution, types and working principles of light microscopes, electron microscopes and their working principles. Microscopic technique: tissue obtaining, fixation, the chemical properties of fixatives, dehydration, clearing, infiltration, embedding, sectioning, staining							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Individual Study					
Name of Lecturer(s)		Lec. Göksel DOĞAN, Lec. Özay GÜLEŞ, Prof. Sadiye KUM							

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	70

Recommended or Required Reading

1	1. Alberts B, Bray D, Lewis J, Raff M, Roberts K, Watson JD. (1989) Molecular Biology of the Cell, Garland Publishing, Inc. London.
2	Banks, W.J. (1986). Applied Veterinary Histology, Williams&Wilkins, U.S.A.
3	Culling C.F.A., Allison R.T., Barr W.T.: Cellular Pathology Technique. Butterworths and Co Ltd, 1985, London.
4	4. Eren Ü (1998) Mikroskop Bilgisi. (Yardımcı Ders Kitabı), ADÜ Basımevi, Aydın
5	Junqueira LC, Carneiro J. (2005) Basic Histology, The McGraw-Hill Companies, USA
6	Kierszenbaum, A. L. (2007) Histology and Cell Biology. An introduction to Pathology, Mosby, Elsevier, Kanada.
7	Ross MH, Reith EJ, Romrell LJ. (1989) Histology. A Text and Atlas, Williams & Wilkins, London

Week	Weekly Detailed Course Contents	
1	Theoretical	Properties of light microscopes
	Practice	Bright field microscope
2	Theoretical	Resolution
	Practice	Bright field microscope
3	Theoretical	Resolution differences between light and electron microscopes
	Practice	Fluorescence microscope
4	Theoretical	Light microscope types and their working principles
	Practice	Phase contrast microscope
5	Theoretical	Light microscope types and their working principles
	Practice	Inverted mikroskop
6	Theoretical	Electron microscope types and their working principles
	Practice	Research microscope
7	Theoretical	Electron microscope types and their working principles
	Practice	Video, slide presentation
8	Intermediate Exam	Midterm exam
	Theoretical & Practice	Repetition of subjects and Midterm exam
9	Theoretical	Tissue sampling for light microscopy
	Practice	Tissue sampling for light microscopy
10	Theoretical	Fixation and properties of chemical fixatives
	Practice	Samples of fixatives



11	Theoretical	Dehydration, clearing, infiltration and embedding
	Practice	infiltration and embedding
12	Theoretical	Sectioning
	Practice	Sectioning
13	Theoretical	Staining
	Practice	Staining
14	Theoretical	Tissue preparation for electron microscopy
	Practice	Video, slide presentation
15	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	13	0	1	13
Lecture - Practice	13	0	2	26
Seminar	2	9	1	20
Reading	9	0	1	9
Midterm Examination	1	11	2	13
Final Examination	1	17	2	19
Total Workload (Hours)				100
[Total Workload (Hours) / 25*] = ECTS				4

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	Learns the working principles of light and electron microscopes
2	Knows take a sample of tissues, and about rutin procedure for tissue processing
3	Understands the principles of staining, and staining procedures.
4	Makes the sample preparation for electron microscopy.
5	Learns electron microscope types.

Programme Outcomes (Histology and Embryology (Veterinary Medicine) Doctorate)

1	Gains expert knowledge on the function and basic histological features of cells, tissues and systems in animals.
2	Gains expert knowledge on the stages of embryonal and fetal development in both mammals and birds.
3	Based on his/her training during the Master of Science program, he/she has in depth knowledge in the field of histology/embryology as well as in areas related to his/her area of expertise.
4	Using basic knowledge gained during the undergraduate and master of science program, develops ,critically evaluates and tests novel ideas in his/her area of expertise.
5	Endowed with theoretical and practical knowledge as for the scientific research and methodology to be able to conduct an independent research project.
6	Has theoretical knowledge concerning skills (leadership, entrepreneurship, ability to reach information technologies, organization, industrial correspondence etc.). Knows laws and regulations concerning his/her area of expertise and related subjects.
7	Determines and uses laboratory equipment and consumables in a histology laboratory. Has the ability to solve problems in his/her area of expertise.
8	Has the ability to design and develop scientific methodology concerning new developments in his/her area of expertise. Has the ability to put established methods in use to tackle current problems in his/her area of expertise.
9	Designs and conducts an independent research project on his/her own.
10	Critically evaluates and reaches to a synthesis of new ideas in his/her area of expertise and related fields.
11	Uses and develops modern technologies in his/her area of expertise towards the industry in a systematic and critical manner.
12	Performs his/her expertise with the recognition of the rights and responsibilities obtained with the completion of doctorate program in histology/embryology.
13	Is able to break down new and immature ideas into simple components and suggest alternative solutions by using his/her ability to recognize possible relationships among these components.
14	If the need arises, designs an interdisciplinary research project , forms a team, leads and finalizes the research project to solve an old or a new problem in the field of histology/embryology.
15	Attends to activities such as congresses, panels, symposiums, workshops, seminars, journal clubs in his/her area of expertise, shares information in his/her area of expertise and contributes to the solution of a problem by interacting with experts in other fields.



16	Expands a growing body of information in his/her area of expertise by publishing scientific articles in national and international journals.
17	Is in recognition of taking professional and ethical responsibilities.
18	Develop new ideas and methods that has the potential to ignite social and cultural progress or add values to the information society by using practical and theoretical knowledge gained throughout his/her training and his/her skill to work independently and to take responsibilities.
19	Makes the concept of life-long learning a matter of principle and recognizes the fact that evidence-based information is the most important gain of education.
20	Provides information and manages information exchanges on issues of public and animal health in committees with the aim of defining and solving a problem using his/her expertise.

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4
P1	4	4	4	4
P5	4	4	4	4
P7	4	5	5	5
P11	4	4	4	4

