

NAME OF THE COURSE		APPLIED HISTOLOGY OF MARINE ORGANISMS				
Code	PMB538	Year of study	2			
Course teacher	Prof. Ivana Bočina, PhD	Credits (ECTS)	3			
Associate teachers	Jerko Hrabar, PhD	Type of instruction (number of hours)	L	S	E	F
			15		15	
Status of the course	Elective	Percentage of application of e-learning	10%			
COURSE DESCRIPTION						
Course objectives	The purpose of applied histology is to discern mechanisms by which different environmental factors affect cells of an organism and their consequences on the survival of an individual in its ecosystem. The aim of the course is to teach students to recognize the physiological appearance of marine animals' tissues and aberrations from it.					
Course enrolment requirements and entry competences required for the course	Passed exams in Cell Biology and Anatomy and Histology					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Student will be able to:</p> <ul style="list-style-type: none"> -describe characteristics of different organ systems of marine organisms -determine differences in tissue architecture among different marine organisms -understand the impact of different environmental factors (chemical, mechanical, biological) on tissue architecture -understand and apply procedures for histological processing -independently prepare a tissue slide -identify different tissue types 					
Course content broken down in detail by weekly class schedule (syllabus)	<p>LECTURES:</p> <ol style="list-style-type: none"> 1. General principles in histology and tissue types 2. Comparative anatomy and physiology of marine fish 3. Fish skin and gills 4. Fish musculoskeletal system 5. Fish nervous system 6. Fish hematopoietic, circulatory and excretory system 7. Fish digestive system I (GI tract) 8. Fish digestive system II (liver, gall bladder, pancreas) and swim bladder 9. Fish reproductive system 10. Histopathology of selected fish diseases 11. Histology and histopathology of bivalve molluscs 12. Histology and histopathology of cephalopods 13. Histology and histopathology of crustaceans 14. Comparative anatomy and histology of marine mammals I 15. Comparative anatomy and histology of marine mammals II <p>EXCERSISES:</p> <ol style="list-style-type: none"> 1. Introduction to work in histological laboratory 2. Tissue preparation for histological analysis: Necropsy and fixation 3. Tissue preparation for histological analysis: Dehydration and clearing 4. Tissue preparation for histological analysis: Impregnation and paraffin-embedding 5. Basic and differential staining of tissue sections 6. Microscopy of prepared tissue slides 7. Other techniques for histological analysis 					

Format of instruction	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> <i>on line</i> in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input type="checkbox"/> independent assignments <input type="checkbox"/> multimedia <input checked="" type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)			
Student responsibilities	Attendance of lectures and exercises					
Screening student work (<i>name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course</i>)	Class attendance	1	Research		Practical training	1
	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1	(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	The exam consists of oral and practical part during which the student needs to determine the tissue type and identify and describe key features of the tissue.					
Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	1. KOZARIĆ, Z.: Veterinarska histologija					
	2. SHEEHAN, D.C., HRAPCHAK, B.B.: Theory and practice of histotechnology					
	3. GESTAL, C., PASCUAL, s., GUERRA, A., FIORITO, G., VIEITES, J.M.: Handbook of Pathogens and Diseases in Cephalopods					
	4. MOKHTAR, D.: Fish Histology – From Cells to Organs					
Optional literature (at the time of submission of study programme proposal)	1. JUNQUIERA, L.C., CARNEIRO, J.: Osnove histologije					
	2. GRIZEL, H. (ed): An atlas of histology and citology of marine bivalve molluscs					
Quality assurance methods that ensure the acquisition of exit competences	Active participation in the course, evaluation of course and teacher through student questionnaire, personal consultation.					
Other (as the proposer wishes to add)						