

NAME OF THE COURSE		Vertebrates				
Code	PMB031	Year of study	3			
Course teacher	Professor Mate Šantić, PhD	Credits (ECTS)	6.5			
Associate teachers	Assistant Professor Antonela Paladin, PhD	Type of instruction (number of hours)	L	S	E	F
			30		45	
Status of the course	Mandatory	Percentage of application of e-learning	10%			
COURSE DESCRIPTION						
Course objectives	Acquire and understand the evolutionary development, anatomy, taxonomy and the spread of the chordates and vertebrates. Understand the comparative anatomy between the different vertebral classes.					
Course enrolment requirements and entry competences required for the course	Passed exams in General Zoology, Avertebrates and Human Anatomy.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>Student will be able to:</p> <ol style="list-style-type: none"> <li>1. Compare anatomical characteristics of chordates and vertebrates.</li> <li>2. Define the systematic division of chordates based on morphology, anatomy, physiology and ecology.</li> <li>3. Understand the development of vertebrate organs during their evolution.</li> <li>4. Integrate anatomical properties of certain vertebrate groups.</li> <li>5. Explain the fundamental principles of physiological processes in the vertebrates.</li> <li>6. Adopt basic knowledge of zoogeography and paleontology of the vertebrates.</li> <li>7. Define the main habitats of the vertebrates in Croatia.</li> </ol>					
Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures:</p> <ol style="list-style-type: none"> <li>1. Introduction in Vertebrates, Systematic classification of Chordates.</li> <li>2. Hemychordates. Invertebrate relatives of the chordates.</li> <li>3. Subphylum Tunicates (Urochordates). Developments of Ascidiars. Various forms of tunicate.</li> <li>4. Subphylum Cephalochordates</li> <li>5. Vertbrates. Anatomical and physiological properties. Classification of Vertebrates. Class Cyclostomata (Vertebrates without jaws).</li> <li>6. Gnathostomata (Jawed vertebrates). Class Chondrichthyes (cartilaginous fishes). morphology, skin, skeleton, muscles, respiration, circulatory system.</li> <li>7. Class Chondrichthyes. Osmoregulation, endocrine glands, nervous system, senses, genital system, evolution. Systematics.</li> <li>8. Class Osteichthyes (bony fish). Morphology, skin, skeleton, muscles, digestion, endocrine system, respiration, circulation, nervous system.</li> <li>9. Class Osteichthyes sensory system, genital system and reproduction, specific organs in fish, evolution, systematics.</li> <li>10. Class Amphibia. Skin, locomotion, limbs and muscles, skull, skeleton, respiration, vocal apparatus, circulation, lymphatic vessels, blood, urogenital system, digestive system, nervous, Sensory system, evolution, systematic classification.</li> </ol>					

	<p>11. Class Reptilia. Skin, temperatures, locomotion, skeleton, muscles, feeding and digestion, respiration, circulation, metabolism, urogenital system, nervous system, evolution, classification.</p> <p>12. Class Aves - life in the air. Features of bird life, variety and numbers, morphology, skin and feathers, skull and skeleton, muscles, digestion, respiration and air-sacs.</p> <p>13. Class Aves. Principles of flight, endocrine organs, circulation, nervous system, urogenital system, evolution, classification.</p> <p>14. Class Mammalia. Morphology, skeleton, muscles, digestion, circulation, blood, nervous system, sensory system, endocrine organs and hormones.</p> <p>15. Class Mammalia. Metabolism and temperatures, urogenital system, development of embryo and young, evolution, classification. Anatomical comparison of the vertebrates.</p> <p>Exercises:</p> <p>1. Hemichordates and Tunicates - the basic principle of anatomy, classification, overview of major species (3 hours)</p> <p>2. Cephalochordates - the basic principle of anatomy, classification, overview of major species (3 hours)</p> <p>3. Lampreys - the basic principle of anatomy, classification, overview of major species (3 hours)</p> <p>4. Cartilage fishes - the basic principle of the external anatomy (3 hours)</p> <p>5. Cartilage fishes - the basic principle of the internal anatomy, classification, overview of major species (3 hours)</p> <p>6. Bony fishes - the basic principle of anatomy, classification, overview of major species (3 hours)</p> <p>7. Determination of Adriatic fish species, the use of identification key (3 hours)</p> <p>8. Amphibians - the basic principle of anatomy, classification, overview of major species (3 hours)</p> <p>9. Reptiles - the basic principle of anatomy, classification, overview of major species (3 hours)</p> <p>10. The amphibians and the reptiles of Croatia (3 hours)</p> <p>11. Birds - the basic principle of the external anatomy (3 hours)</p> <p>12. Birds - the basic principle of the internal anatomy, classification, overview of major species (3 hours)</p> <p>13. The birds of Croatia (3 hours)</p> <p>14. Mammals - the basic principle of anatomy, classification, overview of major species (3 hours)</p> <p>15. The mammals of Croatia (3 hours)</p>					
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 type="checkbox"/> laboratory <input type="checkbox"/> work with mentor <input type="checkbox"/> (other)			
Student responsibilities	Attendance of lectures and exercises, active participation in course.					
Screening student work ( <i>name the</i>	Class attendance	3.0	Research		Practical training	2.0

<i>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>	Experimental work		Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	1.5	(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	During semester: Students are evaluated by 2 written test Finally exam: on the basis of written and oral exam					
Required literature (available in the library and via other media)	<b>Title</b>			<b>Number of copies in the library</b>	<b>Availability via other media</b>	
	Young JZ: The life of Vertebrates. Clarendon press – Oxford, 1989.			1		
	Pough FH, Janis CM, Heiser JB: Vertebrate life. Ninth edition. Pearson Prentice Hall, 2005.			1		
	Kardong KV, Zalisko E: Comparative vertebrate anatomy, a laboratory dissection guide. McGrawHill, 2006.			1		
	Hickman CP, Hickman FM, Kats LB: Laboratory studies in Zoology, integrated principles. McGrawHill, 2003.			1		
Optional literature (at the time of submission of study programme proposal)	Onofri I: Zoologija II. Udžbenici Sveučilišta u Splitu, 1997. Burnie D: Enciklopedija životinja, Mozaik knjiga, Zagreb, 2001 Jardas I: Jadranska ihtiofauna. Školska knjiga, Zagreb, 1997. Šafarek G: Animals in Croatia. Mozaik knjiga d.o.o. Zagreb, 2014.					
Quality assurance methods that ensure the acquisition of exit competences	Students surveys and consultations.					
Other (as the proposer wishes to add)						