

NAME OF THE COURSE		Application of imaging techniques in life sciences						
Code	PMB530	Year of study			1 <sup>st</sup>			
Course teacher	Professor <b>Ivana Bočina</b> , PhD Assistant Professor <b>Nives Kević</b> , PhD	Credits (ECTS)			2			
Associate teachers		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 aim of this course is to introduce the possibilities and challenges of light and electron microscopy in life sciences. The students will learn about applications of microscopy techniques in life sciences. The students should be able to prepare sample for microscopy as well as to process and analyze the image obtained using microscopy techniques.							
Course enrolment requirements and entry competences required for the course	No competences are required for the course.							
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>After the course the students should be able to:</p> <ol style="list-style-type: none"> <li>1. Explain the fundamentals of microscopic imaging.</li> <li>2. Explain how microscopy techniques can be used.</li> <li>3. Describe and explain the importance of imaging in science.</li> <li>4. Name and explain the methods in light microscopy.</li> <li>5. Explain the differences between light and electron microscopy.</li> <li>6. Prepare the specimen for light and electron microscopy.</li> <li>7. Process and analyse the image.</li> </ol>							
Course content broken down in detail by weekly class schedule (syllabus)	<p>Lectures: / Exercises:</p> <p>Lectures (15 hours): Introduction to microscopy. Light microscopy. Electron microscopy (3 hours). Fluorescence microscopy. Immunohistochemistry and immunofluorescence (3 hours). Basic histological techniques in the natural sciences (3 hours). Microphotography as a source of information in biology (3 hours). Transmission electron microscopy in natural sciences (3 hours).</p> <p>Laboratory exercises (15 hours): Sample preparation for light microscopy. Sample preparation for fluorescent microscopy. Sample preparation for electron microscopy.</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 checked="" 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	Active participation in lectures and exercises, preparation of the final presentation and/or short exam.							
Screening student work ( <i>name the proportion of ECTS credits for each activity so that the total number of</i>	Class attendance	0,5	Research		Practical training			
	Experimental work	0,5	Report		(Other)			
	Essay		Seminar essay	0,5	(Other)			

<i>ECTS credits is equal to the ECTS value of the course)</i>	Tests		Oral exam	0,5	(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	The students will be evaluated upon their seminar presentation 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>	
	Anthony L. Mescher (2018) Junqueira's Basic Histology, Text and Atlas. 15th edition. McGraw-Hill Education, USA				Avaible at teacher in electronic form	
	Protocols_ Application of imaging techniques in Life Sciences.pdf				Avaible at teacher in electronic form	
	Bočina, Kević (2019): Application of imaging techniques in Life Sciences -power point lectures				Avaible at teacher in electronic form	
Optional literature (at the time of submission of study programme proposal)	Kim S. Suvarna, Christopher Layton, John D. Bancroft (2018) Bancroft's Theory and Practice of Histological Techniques. 8th edition. Elsevier					
Quality assurance methods that ensure the acquisition of exit competences	Active participation in lectures and consultations. Evaluation of courses and teacher by University or/and internal survey.					
Other (as the proposer wishes to add)						