

NAME OF THE COURSE		Methods in Microscopy				
CODE	PMB722	Years of study	2			
Course teacher	Ivana Bočina, PhD, Professor	Credits (ECTS)	3			
Associate teachers	Nives Kević, PhD, Assistant Professor	Type of instruction (number of hours)	L	S	E	F
			15		30	
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 biology. The students will learn about applications of microscopy techniques in biology. The students should be able to prepare sample for light and transmission electron microscopy.					
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 attending the course students should be able to:</p> <ul style="list-style-type: none"> <li>• Explain the fundamentals of microscopic imaging.</li> <li>• Explain how microscopy techniques can be used.</li> <li>• Describe and explain the importance of imaging in science.</li> <li>• Name and explain the methods in light microscopy.</li> <li>• Explain the differences between light and electron microscopy.</li> <li>• Prepare the specimen for light and transmission electron microscopy.</li> </ul>					
Course content broken down in detail by weekly class schedule (syllabus)	<p>LECTURES:</p> <ol style="list-style-type: none"> <li>1. Week: Introductions to methods in microscopy. (1 hour)</li> <li>2. Week: Methods in light microscopy. (1 hour)</li> <li>3. Week: Histochemistry. (1 hour)</li> <li>4. Week: Tissue processing for histochemistry: fixation, dehydration and clearing. (1 hour)</li> <li>5. Week: Impregnation of tissue, embedding in paraffin and cutting. (1 hour)</li> <li>6. Week: Staining in histochemistry. (1 hour)</li> <li>7. Week: Immunohistochemistry and immunofluorescence. (1 hour)</li> <li>8. Week: Tissue processing for immunohistochemistry and immunofluorescence. (1 hour)</li> <li>9. Week: Staining in immunohistochemistry. (1 hour)</li> <li>10. Week: Staining in immunofluorescence. (1 hour)</li> <li>11. Week: Transmission electron microscopy. (1 hour)</li> <li>12. Week: Tissue processing for transmission electron microscopy: fixation, postfixation, dehydration. (1 hour)</li> <li>13. Week: Impregnation, embedding in resin and cutting. (1 hour)</li> <li>14. Week: Immunogold labelling in transmission electron microscopy. (1 hour)</li> <li>15. Week: Contrasting of ultrathin sections. (1 hour)</li> </ol> <p>EXERCISES:</p> <p>1<sup>st</sup>- 7<sup>th</sup> Week: Tissue processing for light microscopy: fixation, dehydration, clearing, impregnation, embedding, cutting and staining for histochemistry, immunohistochemistry and immunofluorescence. (15 hours)</p>					

	8 <sup>th</sup> – 15 <sup>th</sup> Week: Tissue processing for transmission electron microscopy: fixation, postfixation, dehydration, impregnation, embedding, cutting and contrasting. (15 hours).					
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, short exam.					
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	
	Experimental work	1	Report		(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam		(Other)	
	Written exam	1	Project		(Other)	
Grading and evaluating student work in class and at the final exam	The students will be evaluated upon written 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>	
	Teaching materials prepared by course teachers.					
	Saraga-Babić M, Sapunar D, Puljak L, Vukojević K, Lovrić Kojundžić S, Carev D. Histology Atlas. Virtual Medical School, 2007. <a href="http://www.vms.hr/HistologyAtlas/index.htm">http://www.vms.hr/HistologyAtlas/index.htm</a>					
Optional literature						