

NAME OF THE COURSE		Experimental Methods of Modern Physics				
Code	PMP122	Year of study	1 <sup>st</sup>			
Course teacher	Ante Bilušić	Credits (ECTS)	4.0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30	15		
Status of the course	Obligatory and elective course	Percentage of application of e-learning	20%			
COURSE DESCRIPTION						
Course objectives	Understanding of the theoretical background of selected experimental methods. Work on selected experimental devices and related data analysis					
Course enrolment requirements and entry competences required for the course	None.					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>By the end of the course, students are expected:</p> <ul style="list-style-type: none"> <li>• <b>to understand</b> the theoretical background of selected experimental methods,</li> <li>• <b>to describe</b> the parts and principles of selected experimental devices,</li> <li>• <b>to analyze</b> the results obtained from the use of selected experimental methods,</li> <li>• <b>to use</b> independently at least two selected experimental devices</li> </ul>					
Course content broken down in detail by weekly class schedule (syllabus)	<p><u>Lecturers:</u></p> <ul style="list-style-type: none"> <li>• spectroscopy methods: <ul style="list-style-type: none"> <li>○ light sources and optical spectroscopy (4 hours),</li> <li>○ nuclear magnetic resonance (4 hours),</li> <li>○ X-ray diffractometry (3 hours),</li> <li>○ electron microscopy (2 hours),</li> <li>○ atomic force microscopy(1 hour),</li> <li>○ gamma and neutron diffraction (1 hour),</li> <li>○ ultrasound diffraction (2 hours)</li> </ul> </li> <li>• vacuum techniques (2 hours),</li> <li>• lithography techniques (1 hour),</li> <li>• thermometry and cryogenics(4 hours),</li> <li>• SQUID (2 hours),</li> <li>• Nuclear fusion (2 hours),</li> <li>• Methods in astronomy and astrophysics (2 sat)</li> </ul> <p><u>Seminars:</u></p> <ul style="list-style-type: none"> <li>• Introductory courses on selected experimental techniques (5 sati)</li> <li>• Independent work on two of the following techniques (10 sati): <ul style="list-style-type: none"> <li>○ electron microscopy,</li> <li>○ atomic force microscopy,</li> <li>○ magnetron sputtering and optical lithography,</li> <li>○ measurements of the electrical transport properties.</li> </ul> </li> </ul>					
Format of instruction	<input checked="" type="checkbox"/> lectures <input checked="" type="checkbox"/> seminars and workshops <input 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						
Screening student work (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)	Class attendance	1.0	Research		Practical training	
	Experimental work	0.5	Report	0.5	(Other)	
	Essay		Seminar essay		(Other)	
	Tests		Oral exam	2.0	(Other)	
	Written exam		Project		(Other)	
Grading and evaluating student work in class and at the final exam	The mark is defined on the oral exam. The condition for taking the oral exam is positively evaluated reports on experimental work in selected experimental techniques.					
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>	
	Ante Bilušić, internal script, in Croatian			0	yes (free access)	
Optional literature (at the time of submission of study programme proposal)	<ul style="list-style-type: none"> <li>• M. Furić, <i>Moderne eksperimentalne metode, tehnike i mjerenja u fizici</i>, Školska knjiga, Zagreb, 1992., in Croatian</li> <li>• R. A. Dunlap, <i>Experimental Physics – Modern Methods</i>, Oxford University Press, New York, 1988.</li> </ul>					
Quality assurance methods that ensure the acquisition of exit competences	Statistics of students' results and students' evaluation via anonymous questionnaires at the end of the course. The survey is conducted according to the rules of the University of Split.					
Other (as the proposer wishes to add)						