NAME OF THE COURSE	History of Modern Physics					
Code	PMP103	Year of study	1			
Course teacher	Mile Dželalija, PhD, Professor – tenure	Credits (ECTS)	3,0			
Associate teachers		Type of instruction (number of hours)	L	S	E	F
			30			
Status of the course	Compulsory / elective	Percentage of application of e-learning	30 %			

COURSE DESCRIPTION		
Course objectives	Critical understanding of historical development of basic concepts and principles in relativistic physics, quantum physics, elementary particle physics and cosmology.	
Course enrolment requirements and entry competences required for the course	Basic knowledge of relativistic physics, quantum physics, elementary particle physics, and cosmology.	
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	1. Explain key conceptual elements that characterised classical mechanics, electromagnetism, thermodynamics, and historical cosmologies; 2. Explain philosophical and historical background for development of modern physics; 3. Discus the contribution of main physicists to the development of special relativity, quantum physics, particle physics and cosmology; 4. Describe experiments and events that characterised the development of ideas and experimental techniques in special relativity, quantum physics, particle physics and cosmology; 5. Critically analyse conceptual evolution of knowledge in special relativity, quantum physics, particle physics and cosmology; 6. Discuss methods and tools for historical analyses of development of modern physics; 7. Discuss key challenges of modern physics.	
Course content broken down in detail by weekly class schedule (syllabus)	(2h) Key concepts in classical mechanics, electromagnetism, thermodynamics, and historical cosmologies (2h) Key challenges in classical physics (2h) Selected historical experiments related to special theory of relativity (4h) Development of new ideas, models and theories leading to special theory of relativity (2h) Selected historical experiments related to quantum physics (4h) Development of new idea, models and theories leading to quantum physics (2h) Selected historical experiments related to particle physics (4h) Development of new ideas, models and theories leading to models and theories of atoms, nucleus and elementary particles (2h) Selected historical experiments related to development of cosmology (2h) Development of new ideas, models and theories leading to modern cosmology (4h) Challenges of models and theories in modern physics	
Format of instruction	☒ lectures ☐ seminars and workshops ☐ exercises ☐ on line in entirety ☒ partial e-learning ☐ field work	☒ independent assignments ☐ multimedia ☐ laboratory ☐ work with mentor ☒ homework assignments
Student responsibilities	Homework assignments during semester. Written exam.	

<table>
<tr><td>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)</td><td>
<table>
<tr><th>Name</th><th>ECTS</th><th>Name</th><th>ECTS</th><th>Name</th><th>ECTS</th></tr>
<tr><td>Class attendance</td><td>1</td><td>Research</td><td></td><td>Experimental work</td><td></td></tr>
<tr><td>Oral exam</td><td></td><td>Report</td><td></td><td>Homework assignments</td><td>1</td></tr>
<tr><td>Seminar essay</td><td></td><td>Essay</td><td></td><td></td><td></td></tr>
<tr><td>Tests</td><td></td><td>Practical training</td><td></td><td></td><td></td></tr>
<tr><td>Written exam</td><td>1</td><td>Project</td><td></td><td></td><td></td></tr>
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<tr><td>Grading and evaluating student work in class and at the final exam</td><td>Homework assignments during semester: 50 %; written exam: 50 %.</td></tr>
<tr><td>Required literature (available in the library and via other media)</td><td>
<table>
<tr><th>Title</th><th>Number of copies in the library</th><th>Availability via other media</th></tr>
<tr><td>[1] M. Dželalija: History of Modern Physics, University of Split, Faculty of Science, Split, 2020.</td><td>0</td><td>yes</td></tr>
<tr><td>[2] Selected famous historical research articles in relativistic physics, quantum physics, particle physics and cosmology.</td><td>0</td><td>yes</td></tr>
</table>
</td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td>[1] Ž. Dadić, Povijest metoda i ideja u matematici I fizici, ŠK, Zagreb, 1992.
[2] I. Supek, Povijest fizike, ŠK, Zagreb, 1980.
[3] James T. Cushing: Philosophical Concepts in Physics: The Historical Relation between Philosophy and Scientific Theories, Cambridge University Press, 1998.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td>Discussion with students and analysing their progress in solving problem and assignments.
Statistics of exam results and evaluation of efficacy in accordance with the learning outcomes.
Student evaluation by anonymous survey conducted according to the rules of the University of Split.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td></td></tr>
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