<table>
<tr><td>NAME OF THE COURSE</td><td colspan="5">Modern Spectroscopy</td></tr>
<tr><td>Code</td><td>PMP207</td><td>Year of study</td><td colspan="3">1</td></tr>
<tr><td>Course teacher</td><td>Martina Požar, PhD, Assistant Professor</td><td>Credits (ECTS)</td><td colspan="3">6,0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Martina Požar, PhD, Assistant Professor</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td>15</td><td>15</td><td></td></tr>
<tr><td>Status of the course</td><td>Elective</td><td>Percentage of application of e-learning</td><td colspan="3">30%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Understanding of theoretical principles of spectroscopy.
The ability to connect the theoretical principles of spectroscopy to the experiment.
The application of group theory to molecules and its uses in spectroscopy.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Basic knowledge of general and quantum physics.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">After the exam the student should:
1. Know how to explain the basic principles of spectroscopy.
2. Be able to explain the physical principles that form the basis of spectroscopic methods.
3. Know how to interpret the spectra of selected experimental methods.
4. Be able to state and elaborate on the application of spectroscopic methods in science.
5. Know how to explain the work principle behind spectroscopic methods.
6. Understand the application of group theory on molecules and its uses in spectroscopy.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Lectures:
(5h) The basic principles of spectroscopy
(3h) Rotational spectroscopy
(5h) Vibrational spectroscopy
(5h) Electron spectroscopy
(2h) Spin-resonant spectroscopies
(10h) Group theory application in spectroscopy
Exercises:
(15h) During the semester, the students participate in exercises, whch may be either auditory or experimental (depending on the circumstances).
Seminars:
(15h) Approaching the end of the semester, the students work on their seminary papers and present them in a seminary presentation.</td></tr>
<tr><td>Format of instruction</td><td colspan="2">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work</td><td colspan="3">☐ independent assignments
☐ multimedia
☒ laboratory
☐ work with mentor
☐ homework assignments</td></tr>
<tr><td>Student responsibilities</td><td colspan="5">The attendance and activity during the lectures and exercises. It’s necessary to have at least 70% attendance.
Presented seminary paper.
Oral examination.</td></tr>
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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)*	Name	Ects	Name	Ects	Name	Ects
	Class attendance	1	Research		Experimental work	1
	Oral exam	2.5	Report		Homework assignments	
	Seminar essay	1.5	Essay			
	Tests		Practical training			
	Written exam		Project			

Grading and evaluating student work in class and at the final exam	The final grade consists of three parts: 1. theoretical knowledge (50 %), 2. presentation of the seminary paper (30 %), 3. work during the exercises/experiment (20 %).

	Title	Number of copies in the library	Availability via other media
Required literature (available in the library and via other media)	[1] R Chang, Basic Principles of Spectroscopy, McGraw-Hill Book Company, 1971.	0	yes
	[2] C.N. Banwell, E. M. McCash, Fundamentals of Molecular Spectroscopy, 4th edition, Mc Graw Hill India, 2016	0	yes
	[3] A. Vincent, „Molecular Symmetry and Group Theory", Wiley & sons, 2013.	0	yes

Optional literature (at the time of submission of study programme proposal)	[1] J. M. Hollas, Basic Atomic and Molecular Spectroscopy, The Royal Society of Chemistry, 2002. [2] J. M. Hollas, Modern spectroscopy, 4th edition, John Wiley & Sons Ltd, 2004. [3] G. Gauglitz, D. S. Moore, Handbook of Spectroscopy, 2nd edition, John Wiley & Sons Ltd, 2014. [4] J. Z. Zhang, Optical Properties and Spectroscopy of Nanomaterials, World Scientific, 2009. [5] A. Myers Kelley, Condensed-Phase Molecular spectroscopy and Photophysics, John Wiley & Sons Ltd, 2013.
Quality assurance methods that ensure the acquisition of exit competences	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.
Other (as the proposer wishes to add)	