NAME OF THE COURSE	Introduction to atomic and molecular physics					
Code	PMP204	Year of study	1			
Course teacher	Martina Požar, PhD, Assistant Professor	Credits (ECTS)	6,0			
Associate teachers	Martina Požar, PhD, Assistant Professor	Type of instruction (number of hours)	L	S	E	F
			30	30		
Status of the course	Madatory/Elective	Percentage of application of e-learning	20%			

COURSE DESCRIPTION

Course objectives	Understanding atomic and molecular structure and the way it manifests in spectra. Undestanding how to apply symmetry to objects like molecules and how group theory can help us predict some preperties, e.g. the normal modes of molecules.
Course enrolment requirements and entry competences required for the course	Basic knowledge of quantum physics.
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	After the exam the student should: 1. Understand group theory and apply it to calculate the normal modes of molecules and the hybridization of molecular orbitals 2. Derive and use the results of the angular momentum algebra 3. Understand the electron structure of the atom and the processes that happen, with the goal of interpreting spectra 4. Be able to predict and interpret atomic spectra 5. Know how to calculate the electronic structure of molecules, understand the construction of molecular orbitals and the hybridization of molecular orbitals 6. Be able to predict and interpret the electronic, rotational and vibrational spectra of molecules
Course content broken down in detail by weekly class schedule (syllabus)	(20h) Group theory. (8h) Angular momentum algebra (20h) Atomic structure and spectra (12h) Molecular structure and spectra
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	Writing and presenting a seminary paper. Passing the partial tests/written exam. Passing the oral exam.

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	2	Research		Experimental work	
Oral exam	2	Report		Homework assignments	
Seminar essay		Essay			
Tests	2	Practical training			
Written exam		Project			

<table>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td>The final grade consists of three parts:
1. the seminary paper and presentation (20 %),
2. the tests/written exam (40 %),
3. the oral exam (40 %).</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] P. Atkins, R. Friedman: Molecular Quantum Mechanics, Oxford, 2007.</td><td>0</td><td>yes</td></tr>
<tr><td>[2] N. Zettilli, „Quantum Mechanics: Concepts and Applications”, Wiley & sons, 2001</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] A. Vincent, „Molecular Symmetry and Group Theory”, Wiley & sons, 2013.

[2] P. Atkins, J. De Paula, R. Friedman, „Quanta, Matter, and Change: A Molecular Approach to Physical Chemistry”, Oxford University Press, 2008.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td>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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