

Program	Level of studies		First cycle	
	Program name		Physics	
Course name	QUANTUM MECHANICS II			
Course ID	Semester	Course status	ECTS credits	L+E
PTH6711	VI	MANDATORY	6	3+2
Lecturer	Prof. dr. Dejan Milošević			
Aims and intended learning outcomes	<p>The objective of the course is to introduce students to the applications of quantum mechanics, as well as to enable them to independently solve the tasks from this fundamental field of theoretical physics. Formalism developed within the scope of the course Quantum Mechanics I will be applied to various problems of atomic and molecular physics, scattering theory, etc.</p> <p>The learning outcome is mastering theoretical knowledge from the application of quantum mechanics and the ability to independently solve different problems from the application of quantum mechanics.</p>			
Course content				
<p>Approximative methods in quantum mechanics: stationary perturbation theory, variational method, quasiclassical (WKB) approximation, time-dependent perturbation theory. Semiclassical theory of radiation. Spin: Key experiments. Mathematical description of the spin. Pauli's equation. Quantum mechanics of many particle systems: Identical particles. Pauli's principle. Slater's determinant. Theory of atoms and molecules: Methods of calculation of atomic systems. Self-consistent field method (Hartree-Fock method). Thomas-Fermi method. The theory of molecules in adiabatic approximation. Scattering theory: Scattering cross section. Transition amplitude. Born approximation. Method of partial waves. Inelastic scattering.</p>				
Student workload (hours)		Grading		
Lectures and Exercises	75	Assessment method	Points	
Exam preparation	75	Partial exam	50	
Assignments		Final exam	50	
Other				
Total	150			
		Total	100	
Literature				
<p>Mandatory:</p> <ol style="list-style-type: none"> 1. D. Milošević, Kvantna mehanika II, 2015 (available at e-learning) <p>Recommended:</p> <ol style="list-style-type: none"> 1. L. I. Šif, Kvantna mehanika, Vuk Karadžić, Beograd, 1968. 2. Supek, Teorijska fizika i struktura materije, II dio, Školska knjiga, Zagreb, 1977. 3. W. Greiner, Quantum mechanics. An introduction, Springer, Berlin, 1989. 				
Remarks				