

<b>Study Programme:</b> Physics			
<b>Course Unit Title:</b> Advanced course of Atomic and Molecular Physics			
<b>Course Unit Code:</b> M18VKAMF			
<b>Name of Lecturer(s):</b> Full Professor Stevica Đurović			
<b>Type and Level of Studies:</b> Master Academic Degree			
<b>Course Status (compulsory/elective):</b> Compulsory			
<b>Semester (winter/summer):</b> Winter			
<b>Language of instruction:</b> English			
<b>Mode of course unit delivery (face-to-face/distance learning):</b> Face-to-face			
<b>Number of ECTS Allocated:</b> 8			
<b>Prerequisites:</b> Introduction to atomic physics, Atomic physics			
<b>Course Aims:</b> To introduce students to results of modern research in atomic physics.			
<b>Learning Outcomes:</b> After completing the course, students should possess:  - General skills: basic knowledge that can be applied in various fields from medicine to various kinds of research.  - Specific skills: training and competences to upgrade knowledge in doctoral studies.			
<b>Syllabus:</b> <i>Theory</i> Atomic collisions and scattering, the basic concept. Electron-atom collisions. Atom-atom collisions. Elastic and inelastic collisions. Rydberg's atoms. Laser spectroscopy. Atoms in strong laser radiation field. Laser cooling and trapping of atoms. Application of atomic and molecular physics. Magnetic resonance imaging. Atomic optics. Atoms and ions in the cavity of the trap. Atomic clock. Astrophysics. Nonequilibrium plasma. <i>Practice</i> Spectroscopy. Determining the parameters of two atomic molecules.			
<b>Required Reading:</b> <ol style="list-style-type: none"><li>1. B. H. Bransden and C. J. Joachain, Physics of atoms and molecules, Prentice Hall, 2003.</li><li>2. B. M. Smirnov, Physics of atoms and ions, Springer, 2003.</li><li>3. V. S. Lebedev, I. L. Beigman, Physics of highly excited atoms and ions, Springer, 1998.</li><li>4. S. Svanberg, Atomic and molecular spectroscopy, Springer, 2001.</li></ol>			
<b>Weekly Contact Hours:</b>	<b>Lectures:</b> 3	<b>Practical work:</b> 4	
<b>Teaching Methods:</b> Lectures and students group work			
<b>Knowledge Assessment (maximum of 100 points):</b> 100			
<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation	5	written exam	20
Test I and Test II	10	oral exam	50

Preliminary exam(s)	10	.....	
Seminar(s)	5		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			