

Course Unit Descriptor

<b>Study Programme:</b> Physics			
<b>Course Unit Title:</b> Qualitative Methods in Physics			
<b>Course Unit Code:</b> F18KMF			
<b>Name of Lecturer(s):</b> Full Professor Maja Stojanović			
<b>Type and Level of Studies:</b> Bachelor of Science in Physics / Master of Science in Teaching Physics			
<b>Course Status (compulsory/elective):</b> Elective			
<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> 6			
<b>Prerequisites:</b> None			
<b>Course Aims:</b> Introduce students to the possibility of obtaining results without the use of rigorous mathematical formalisms.			
<b>Learning Outcomes:</b> After completion of the course student should have developed: - General skills: reading professional literature, analysis of different solutions and select the most appropriate solutions, creativity - Subject-specific skills: the ability of independent formulation of model of physical phenomena, ability of dimensional analysis of the problem; using symmetry of problems to give a qualitative explanation; estimation of order of magnitude of various effects.			
<b>Syllabus:</b> <i>Theory</i> The difference between quantitative and qualitative approaches in the exact sciences. The formation of models. Examples: solid body, ideal gas, Lorentz approach to electrodynamics. Dimensional analysis. An elementary approach. Pi-theorem. Fluid Mechanics. Application of symmetry to simplify the account. The law of conservation. Application of the theory of groups. Analytical properties. Example: the theory of dielectric constant. Analytical properties of the field theory. Analogies in physics: the exponential growth and decline, saturation, oscillations. <i>Practice</i> Computational exercises and seminars.			
<b>Required Reading:</b> 1. M.Gitterman and V.Halpern: Qualitative Analysis of Physical Problems, Academic Press, New York (1981)			
<b>Weekly Contact Hours:</b>	<b>Lectures:</b> 3	<b>Practical work:</b> 2	
<b>Teaching Methods:</b> Theoretical classes are performed using modern methods of presentation, with the active participation of students, and preparation and presentation of two seminar work.			
<b>Knowledge Assessment (maximum of 100 points):</b> 100			
<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation		written exam	30

Practical work		oral exam	30
Preliminary exam(s)		.....	
Seminar(s)	40		