

Level: bachelor			
Course title: Qualitative Methods in Physics			
Status: elective			
ECTS: 6			
Requirements: -none			
Learning objectives Introduce students to the possibility of obtaining results without the use of rigorous mathematical formalisms			
Learning outcomes 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.			
Syllabus <i>Theoretical instruction</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>Practical instruction</i> Computational exercises and seminars.			
Weekly teaching load			Other:
Lectures: 45	Exercises: 15	Other forms of teaching:	