Study programme(s): Mathematics (M), Applied Mathematics (MAP)
Course title: PHYSICS 1 (M121)
Lecturer(s): Dušan M. Zorica
Course status: compulsory (on M), compulsory on module: Techno-mathematics (MAP)
ECTS points: 5
Requirements: Analysis 1 (on M), Differential and Integral Calculus (on MAP), Analysis 2 (on M), Multidimensional Analysis (on MAP)
Learning Objectives   Introducing students to the basic problems of physics and the mathematical apparatus used in their description and analysis.
Learning Outcomes   *Minimal:* Students should understand the basic concepts and laws of physics and the role of the mathematical apparatus in their formulation.   *Desirable:* Students should develop a sense of mathematical modeling of physics problems and gain experience in formulating and solving them.
Syllabus   *Theoretical instructions*   Wave motion. Transverse waves, wire oscillation, wave equation, interference, standing waves and resonance. Speed of sound, sound waves, supersonic speeds and shock waves.   Coulomb's law. Electric fields. Gauss's law. Electrical potential. Capacitance. Electric current and electrical resistance, Ohm's law. Magnetic fields, inductance. Electromagnetic oscillations. Maxwell's equations, magnetic properties of matter. Electromagnetic waves.   Relativity theory. Photons, photoelectric effect. Schrödinger's equation, Heisenberg's uncertainty principle.   *Practical instructions:*   The exercises follow the exposition materials from the theoretical lectures. Problem solving sessions, examples, exercises.

Literature		
1.	D. Halliday, R. Resnick, J. Walker: **Fundamentals of Physics** *(10th Edition)*, John Wiley & Sons, New York, 2014.	
2.	H.D. Young, R.A. Freedman: **University Physics** *(13th Edition)*, Addison-Wesley, San Francisco, 2012.	
3.	V. Vučić, D. Ivanović: **Fizika II**, Naučna knjiga, Beograd, 1990.	

Number of active classes	**Lectures: 2**	**Exercises: 2**
Teaching methods Classic plenary lectures accompanied by presentations and numerical simulations on the computer and videos of experiments. Discussion with the students. Exercises focus onto typical problems and training their solutions.		
Grading (maximum number of points 100)		

Pre-exam obligations	Points	Final exam	Points
colloquia	**60**	oral exam	**40**