Course Unit Descriptor

Study Programme: Physics

Course Unit Title: Mechanics

Course Unit Code: F18MEH

Name of Lecturer(s): Full Professor Željka Cvejić

Type and Level of Studies: Bachelor of Science in Physics / Master of Science in Teaching Physics

Course Status (compulsory/elective): Compulsory

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 7

Prerequisites: None

Course Aims:

The first course which introduces students to classical mechanics.

Learning Outcomes:

After the following course the student should be able to:

- General abilities: The student is capable of correctly performing experiments, as well as analise the obtained experimental data and computational tasks in clasicall mechanics
- Course specific abilities: By successfully mastering this course the student adopts knowledge from the basic physical principles of mechanics.

Syllabus:

Theory

Units. Dimensions. Measurements. Speed. Velocity. Acceleration. Reference Frames. Newton′s Laws. Gravity. Newton′s Law of Universal Gravitation. Work, Kinetic Energy, Potential Energy. Conservative Forces. Conservation of Mechanical Energy. Non-conservation Forces-Resistive Forces. Impulse-Rockets. Momentum. Conservation of Momentum. Center of Mass. Frame of Centre of Mass. Rotating Rigid Bodies. Angular Momentum. Torques. Statics. Oscillating Bodies. Kepler′s Laws. Rolling Motion. Gyroscopes. Simple Harmonic Oscillations. Breakdown of Classical-Quantum Mechanics.

Practice

Selected experimental exercises: Measurement of length and time. Measurement of mass. Determination of the density of liquid and solid bodies. Hook's law of elasticity. Atwood's machine. Mathematical pendulum. Determination of the moment of inertia. Determination of coefficient of surface tension by micro scale method. Determination of viscosity coefficient by Stokes and Ostvald method. Determining the velocity of sound waves by a resonant method. Computational exercises from all fields of mechanics.

Required Reading: 1. Feynman, Leighton and Sands, Volumen 1, http://www.feynmanlectures.caltech.edu/

Weekly Contact Hours:	**Lectures:** 3	**Practical work:** 4

Teaching Methods:

Lectures, computational exercises and laboratory exercises.

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points
Active class	5	written exam	35

participation			
Practical work	10	oral exam	35
Preliminary exam(s)	15	…….	
Seminar(s)			