Course Unit Descriptor

Study Programme: Mechatronics		
Course Unit Title: Mechanics 2 - General		
Course Unit Code: H201		
Name of Lecturer(s): Dragan Spasić, Miodrag Žigić		
Type and Level of Studies: Bachelor level		
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: 6		
Prerequisites: None		
Course Aims: As one of the fundamental engineering course, it has the aim of developing abstract thinking, as well as acquiring basic knowledge in the field of mechanics of rigid and deformable bodies		
Learning Outcomes: Acquired knowledge is used in further education and in the professional courses.		
Syllabus: Mechanical motions and immovability. Space and time. Force as a measure of mechanical action. Couple as a measure of mechanical action. Couples. Static axioms. Dividing force onto two components. Force reflection. Summing two intersecting forces. Summing two parallel forces. Theorem on three unparallel forces. Facing system force-balance. Summing couples. Plane system of forces and couples – balance. Varignon`s Theorem. Balance of the plane system of rigid bodies. Sliding friction. Centre of the joint system of parallel forces. Centroid. Force intersection. Hypotheses on mechanics of materials. Cauchy-Euler Axiom. Stress vector. Normal and tangential stresses. Axially loaded rods. Statically undetermined tasks with axially loaded rods. Shearing. Geometric properties of flat surfaces. Bending with rods with circular and circular-ring cross sections. Statically undetermined tasks in bending. Beam bending. Linear differential equation of the elastic line. Dot kinematics. Speed and acceleration in Cartesian and natural coordinate system. Dot motion on the circle. Dot motion classification. Projectile motion. Translatory motion of a rigid body. Rigid body spinning around fixed axes. Plane motion of a rigid body. Complex dot motion. Determination principle. Newton`s law on dynamics. Force structure. Two tasks of dynamics. Differential equations on the material point motion in Cartesian and natural coordinate system. Free dot oscillations. Forced dot oscillations. Kinetic energy of a material dot. Force actions. Potential energy. Theorem on the alteration of kinetic energy of a material dot. Law on maintaining the total mechanic energy.		
Required Reading: Relevant literature in English, tbd		
Weekly Contact Hours: 4	**Lectures: 2**	**Practical work: 2**
Teaching Methods: Lectures and practice.		
Knowledge Assessment (maximum of 100 points):		

Pre-exam obligations	points	**Final exam**	points
Group Assignment		Examination Assignment	
Exercises			
Test			
Test			
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			