

Study Programme: Safety at Work, Environmental Engineering			
Course Unit Title: Fundamentals of mechanics			
Course Unit Code: Z108			
Name of Lecturer(s): Damir Madarević			
Type and Level of Studies: Bachelor level			
Course Status (compulsory/elective): compulsory			
Semester (winter/summer): summer			
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:			
Introducing students to the basic principles and methods of mechanics and its application in the analysis of static and dynamic systems.			
Learning Outcomes:			
Students acquire knowledge in mechanics necessary for understanding stationary and non-stationary processes interesting in the environmental engineering. They can be developed and applied in other professional courses and practical work. In the methodological sense, students obtain the pattern for solving diverse engineering problems.			
Syllabus:			
Force, equilibrium, fundamental principles of statics. Constraints and forces of reaction. Equilibrium conditions. Stress, dilatation, axially loaded rods. Hooke's law. Statically indeterminate problems. Torsion of rods, stress, angle of torsion. Bending of beams, stresses. Statical (stationary) models in environmental engineering. Kinematics of particle: reference frame, position vector, velocity and acceleration. Newton's laws of motion. Work, energy and power, conservation and disipation of energy. Stability of dynamical systems. Small oscillations (free, damped and forced), linearization of differential equations of motion. Momentum and its rate of change; application to impact theory. Angular momentum. Dynamics of the system of particles. Kinematics and dynamics of deformable bodies. Elements of rigid body kinematics and dynamics. Dynamical (non-stationary) models in environmental engineering.			
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.			