

COURSE		MECHANICS II		
LECTURER		Asst. Prof. Naida Ademović Ph.D.		
STUDY	STATUS	SEMESTER	NUMBER OF LESSONS L+E	ECTS
B - CE	Compulsory	2	2+1	4
OBJECTIVES				
<ul style="list-style-type: none"> ☐ To introduce students with basic concepts of: - kinematics. i.e. methods for analysis of particle and rigid body motion, - dynamics. i.e. methods for dynamic analysis of moving particles and rigid bodies 				
LEARNING OUTCOMES				
<ul style="list-style-type: none"> ☐ By the usage of mathematical tools be able to find kinematic characteristics of motion of particle, system of particles and rigid bodies (velocity, acceleration, trajectory, angular velocity etc.) ☐ By utilizing dynamical principles be able to establish the relation between motion and external forces for heavy particles and material systems or rigid bodies. 				
COURSE CONTENT				
<ul style="list-style-type: none"> ☐ KINEMATICS. Kinematics of a material particle. Basic concepts: path, position, velocity and acceleration in different coordinate systems. Rectilinear, curvilinear and harmonic motion of a particle. Complex movement of material particle. Rigid body kinematics. Translation, rotation about a fixed axis, plane motion, spherical motion. Motion of a particle on a moving body. The mechanisms, connections, number of degrees of freedom. Velocity of poles, acceleration. Movement of a rigid body. Virtualna displacements of a system, the principle of virtual work. Application of the principle of virtual work on the calculation of forces for statically determined girders. ☐ DYNAMICS. General definitions, axioms. Mechanical work, force field, potential field. Differential equations of the motion of a particle and the general laws of dynamics of particles. Straight and curved movement of the free material point. Oscillatory movement of a material point. Forced and relative motion of the material point. The law of momentum. Moment law. Law of kinetic energy. The dynamics of the relative and komplanatnog movement. The dynamics of a rigid body in space. Approximate theory of gyroscopic effects. Theory of impact. Principle of virtual work. 				
RECOMMENDED LITERATURE				
<ul style="list-style-type: none"> ☐ Andrejev V., Kinematika, Dinamika, Zagreb : Tehnička knjiga, 1973. 				
<p>Examination procedure:</p> <p>During the course the exam consists of two parts which are done in a written form. Each part is scored in the following way: Exam1 regarding kinematics - 50 points, exam2 regarding dynamics - 50 points, in total 100 points.</p> <p>a) If a student achieves 55% from each part (exam 1, exam 2) a final mark is made in accordance with the scale prescribed by the Law on Higher Education, and that being 55% from the theoretical and 55% from the exercise part. If a student does not pass one part (exam 1 or exam 2) then he/she on the final exam takes the part that he/she did not pass in writing. The grade is formed in the same way as in a).</p> <p>b) A student that does not pass the part of the exam that he/she is taking under b) on the second term has to take an integral exam (kinematics and dynamics) and the grade is formed as:</p> <p>50% points acquired during classes + 50% points acquired during the second term Exam cancellation: Students that passed both parts of the exam during the course (exam 1 and exam 2) and are not satisfied with the achieved results in one par, can cancelled it and take this part again during the final exam.</p>				