

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Control Systems		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Dynamics of Mechanisms and Machines		
<b>Lecturer (for lectures)</b>		Veselić R. Boban		
<b>Lecturer/associate (for exercises)</b>		Mitić M. Vladimir		
<b>Lecturer/associate (for OFE)</b>				
<b>Number of ECTS</b>	5	<b>Course status (obligatory/elective)</b>	Obligatory	
<b>Prerequisites</b>				
<b>Course objectives</b>	Introduction to problems in statics, kinematics and dynamics and the methods for their solving. Application in modeling of devices important for automatic control systems.			
<b>Course outcomes</b>	Acquired necessary theoretical knowledge that enables successful solving of various problems of mechanics, with an emphasis on motion and interaction. Ability to form equations of motion and their solving. Analysis of dynamics of systems of rigid bodies. Modeling of the dynamics of transmission components in machines.			
<b>Course outline</b>				
<b>Theoretical teaching</b>	Rigid body static. Reduction of the system of forces: the main force vector and momentum. Equilibrium conditions. Kinematics of material point: kinematic variables, position, motion equation, velocity, acceleration, trajectory, hodographs of velocity and acceleration vectors. Kinematics of rigid body. Translational, rotational and plane movement of rigid body. Degrees of freedom. Dynamics of material point. Differential equations of motion. General laws of dynamics. Work, energy, friction, motion in resistant environments, oscillations. System dynamics. General theorems on dynamics. Mechanical ties. Holonomic and nonholonomic constraints, degree of freedom of a mechanical system with constraints, generalized coordinates. System state coordinates. Dynamics of systems with constraints. Virtual displacement principle. Motion equations in terms of generalized coordinates. Elements of mechanisms theory. Kinematic couples and chains. Dynamics of mechanisms. Mechanics in technical and biological systems. Mechanics of components and devices used in automatic control systems.			
<b>Practical teaching (exercises, OFE, study and research)</b>	Solving of practical examples and problems in mechanics within exercises.			
<b>Textbooks/references</b>				
1	F.P. Beer, E.R., Jr. Johnston, Mechanics for Engineers: Statics and Dynamics, McGraw-Hill, 1987, ISBN-13: 978-0070045842			
2	S.M. Targ, Theoretical Mechanics – Short Course, GK, 1996, (in Serbian).			
3				
4				
5				
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
2	2	0	0	0
<b>Teaching methods</b>	Lectures; Auditory exercises; Consultations.			
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>	<b>Points</b>	<b>Final exam</b>	<b>Points</b>	
<b>Activity during lectures</b>	5	<b>Written exam</b>	40	
<b>Exercises</b>	0	<b>Oral exam</b>	15	
<b>Colloquia</b>	40			
<b>Projects</b>				