

Study Programme: Technical Mechanics and Technical Design		
Course Unit Title: Mechanics 1 - statics		
Course Unit Code: M103		
Name of Lecturer(s): Livija Cvetičanin		
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: 5		
Prerequisites: None		
Course Aims: Acquisition of basic knowledge in Statics. This knowledge will be used as a foundation for studying Mechanical elements and Strength of materials. Besides, it is the basis which enables students to develop the ability of three-dimensional visualization by analyzing problems in space.		
Learning Outcomes: Acquisition of knowledge necessary for the mechanical engineer.		
Syllabus: 1. Space and time. Motion and inaction. 2. Force as a measure of mechanical action. Static equivalent systems. 3. Projecting forces on axis. Analytical definition of force. 4. Torque as a measure of mechanical action. Torque forces. 5. Statics axioms. 6. Axioms on relationships. Relationships and relationship reactions. 7. Addition of intersecting forces. 8. Force decomposition into two components. Force decomposition into three non-parallel components in the plane. 9. Confronted system of forces in the plane. Balance conditions. 10. Theorem on three non-parallel forces in the plane. 11. Static determinacy and indeterminacy. 12. Momentum for a point. 13. Planar system of forces and torques. Balance conditions. 14. Balance of the rigid body planar system. 15. Sliding friction. 16. Rope friction on the cylindrical surface. 17. Rolling friction. Torque friction. 18. Spatial confronted system of forces. Balance. 19. Adding torques. Balance. 20. Crossed forces. 21. Momentum of the axis. 22. Spatial systems of forces and torques. 23. Reducing torsions on dynamo. Central axis. 24. Invariant of an arbitrary system of forces and torques in space. 25. Addition of two parallel forces. 26. Rigid body equilibrium. The proof of the equilibrium existence. 27. Equilibrium of a homogeneous three-dimensional body. Examples. 28. Equilibrium of homogeneous plates. Examples. 36. Equilibrium of homogeneous line. Examples. 29. Analytical statics. Small movement. The number of degrees of freedom. 30. The elementary shift of the body points. Elementary angle of body rotation. 31. Elementary work of force. Elementary work of torques. 32. Ideal relationships. 33. Principles of elementary work. 34. Stability of the equilibrium position.		
Required Reading: Relevant literature in English, tbd		
Weekly Contact Hours: 4	Lectures: 2	Practical work: 2
Teaching Methods: Lectures are auditory, while practice is auditory and computing.		

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.