

Study programme(s): Mathematics (M3)				
Level: bachelor				
Course title: Theoretical Mechanics				
Lecturer: Srboljub S. Simić				
Status: obligatory				
ECTS: 5				
Requirements: none				
Learning objectives Acquiring knowledge about mathematical models in theoretical mechanics and application of mathematical methods in their analysis.				
Learning outcomes Ability to analyze mechanical systems, develop their mathematical models and apply mathematical methods in their study.				
Syllabus <i>Theoretical instruction</i> Newton's laws. Central forces. Energy. Rotating frames. Many-particle systems. Rigid bodies: equations. Soluble problems in rigid body motion. Lagrangian mechanics. Impulsive forces. <i>Practical instruction</i> Mathematical description of forces. Integrable cases of the motion of particle. Energy analysis. Motion in central force field; Binet equation. Motion in the rotating frame. Inertia tensor. Integrable cases of the rigid body motion; gyrocompass; approximate analysis of the top. Lagrange's equations. Impact and impulsive forces. Mathematical modelling of the impact.				
Literature 1. M. Lunn, <i>A First Course in Mechanics</i> , Oxford University Press, Oxford, 1991. 2. Đ. Mušicki, <i>Uvod u teorijsku fiziku – Teorijska mehanika</i> , Beograd 3. V.I. Arnold, <i>Mathematical Methods of Classical Mechanics</i> , Springer-Verlag, Berlin, 2000. 4. R.D. Gregory, <i>Classical Mechanics</i> , Cambridge University Press, Cambridge, 2006.				
Weekly teaching load				Other: 0
Lectures: 2	Exercises: 2	Other forms of teaching: 0	Student research: 0	
Teaching methodology Lectures comprise 2 hours/week of theoretical instruction and 2 hours/week of exercises where mathematical methods are applied in solution of the problems of theoretical mechanics.				
Grading method (maximum number of points 100)				
Pre-exam obligations	points	Final exam	points	
Colloquia	60	Oral exam	40	