Dzemal Bijedic University of Mostar Faculty of Mehcanical Engineering		
Subject title:	**Mechanics 1**	
Cycle level, years of study, semester	I cycle	I year / I semester
Lecturer on the subject:	Assoc. prof. Emir Nezirić	
Contact details:	emir.neziric@unmo.ba	
Total number of subject hours:	30 + 45	
Credit value ECTS-a:	6	
Basic Qualification:	I cycle	
Subject status:	Mandatory	
Preliminary Examination Obligations	-	
Access limitations on the subject:	-	
Explanation of ECTS value:	75 hours of in-class (lectures and excercises) = 75/25 = 3 ECTS 35 homework (4 tasks, 8 homeworks) = 35/25 = 1,4 ECTS 40 self-paced learning = 40/25 = 1,6 ECTS TOTAL: 6 ECTS	
Subject goal:	Teach students methods for solving problems that arise in engineering calculations of statics as part of technical mechanics.	
Description of general and specific competences (knowledge and skills) / learning outcomes	After successfully completing the course components, students are expected to: - Understand the basic axioms and theorems of rigid body statics, be able to determine force components, and know how to calculate the moment of force and its components. - Learn how to reduce a system of forces to selected points, understand how to isolate a body and release it from constraints. - Grasp the conditions of equilibrium and how to express equilibrium equations; be capable of determining unknown forces and reactions from equilibrium conditions. - Understand the phenomenon of friction. Enable solving technical equilibrium problems with friction elements. - Learn the determination of internal forces in the cross-section of beams and frame members and demonstrate the change of these forces along the beam in diagrams. - Learn the determination of forces in truss members. - Understand the determination of the center of gravity of homogeneous slender rods, plates, and the center of gravity of complex homogeneous bodies.	
Course content:	Problems and divisions of mechanics. Force. Rigid body. Newton's laws of mechanics. Axioms of statics. Constraints. Constraint reactions. Resultant of coplanar force systems. Resolving a force into components. Analytical definition of force and resultant of coplanar force systems. Concurrent coplanar force system. Equilibrium conditions of concurrent coplanar force systems. Moment of force about a point. Varignon's theorem on the moment of the resultant of coplanar concurrent force systems. Composition of two parallel forces. Couple of forces. Moment of a couple of forces. Transformations of couples in a plane. Composition of force couples acting in a single plane. Equilibrium conditions of systems of force couples acting in a single plane. Reduction of force to a point. System of parallel forces. Cases when analyzing systems of parallel forces. Equilibrium of systems of parallel forces. System of arbitrary forces in a plane. Reduction of force systems to a specific point. Equilibrium conditions of arbitrary coplanar force systems. Equilibrium of coplanar systems of rigid bodies. Sliding friction. Rough contact reaction. Friction angle and friction cone.	

	Equilibrium under friction. Friction on a flat surface. Friction on a cylindrical surface. Friction in radial bearings. Friction in axial bearings. Rolling friction. Truss structures. Methods of determining internal forces in truss members (method of joints, method of sections - Ritter's method). Application of computers in truss analysis. Planar solid beams. Components of internal forces in planar solid beams. Some examples of planar beams. Frame structures. Diagrams of internal forces in frame structures. Arbitrary spatial force system. Moment of force about an axis. Analytical definition of moment of force about a point. Analytical definition of moment of force about an axis. Summation of spatial force couple systems. Equilibrium conditions of spatial force couple systems. Composition of arbitrary force systems. Angle between the principal force vector and the principal moment vector. The dependence of the principal moment vector on the choice of reduction point. Reduction of arbitrary spatial force systems to simpler forms. Static invariants. Equilibrium conditions of arbitrary spatial force systems. Equilibrium conditions of a constrained body under the action of a spatial force system. Solving problems based on equilibrium conditions under the action of a general spatial force system. Center of a system of parallel forces. Center of mass of a rigid body. Center of mass of some homogeneous bodies. Center of mass of homogeneous bodies of complex shape. Pappus-Guldinus theorems. Spatial beams. Transverse and axial forces. Bending moment and torque in spatial beams
Teaching methods /learning methods:	Lectures, auditory practical lectures, homework, office hours.
Other Student Obligations (if foreseen):	Homeworks and tasks
Assessment Methods / Methods of Examination	Homeworks – 5%. Partial exams – 30%+30% = 60% Tasks (4 tasks) – 20 % Final (oral) – 15% -
List of basic literature and Internet web references:	1 . Isak Karabegović: Statika, Tehnički fakultet Bihać, 2004. 2. N.Zaimović Uzunović, D. Vukojević, N. Hođić i A. Žiga: Statika, Mašinski fakultet u Zenici 2007. 3. L. Rusov: Mehanika I, Naučna knjiga Beograd, 1980. 4. R.C. Hibbeler: Engineering mechanics – Statics, Pearson Prentice Hall, New Jersey (USA) 2013. 5. A. Pytel, J. Kiusalaas: Engineering mechanics – Statics, Cengage Learning, Stamford (USA) 2010.
Quality assurance and performance of the subject	Anonymous survey on the quality of lectures and lecturers.