General information

Course title:	MECHANICS 1
ISVU[1] course code:	ST 102 (38357)
Studies in which the course is taught:	MECHANICAL ENGINEERING,course MECHANICAL ENG.
Course Instructor:	LORKOVIC NENAD
Course Assistant:	
ECTS credits:	5
Semester of the course execution:	1
Academic year:	2022/2023
Exam prerequisites:	-
Lectures are given in a foreign language:	NO
Aims:	Through the course program, students acquire knowledge and skills in mechanics. This includes knowledge of statics, that is, equilibrium conditions for different systems of forces, bonds and reactions of bonds, sliding friction, rolling,truss girders and determination of forces in rods, determination of transverse and longitudinal forces, and bending moments along the beam, drawing diagrams of forces and moments, centre of gravity of lines, surfaces and bodies.

Course

Course structure	Number of contact hours per week:	Number of contact hours per semester:	Student's requirements by type of teaching:
Lectures:	2	30	attendence 80%
Tutorials:	2	30	attendence 80%
Practical (lab) sessions:			
Seminars:			
Field work:			
Other:			
TOTAL:	4	30	attendence 80%

Monitoring of students' work, knowledge evaluation and learning outcomes

(Define exactly six learning outcomes)	LEARNING OUTCOMES (upon completion of the course the student should be able to:)	FACTORS AFFECTING THE GRADE (e.g. term paper, practical work, presentation, …)	MAXIMUM NUMBER OF POINTS PER FACTOR
	I1: Understand and differentiate the meaning of terms:force, moment,coupling forces, bond reactions,equilibrium conditions		
	I2: Release the body from the bonds, plot the reactions of the bonds and apply the equilibrium conditions according to the type of force system		[ ]
	I3: Distinguish the types of friction and applying the laws that define them		
	I4: Understand the concepts and regularities that define the internal forces and moments in truss girders and beams		
	I5: Calculate the internal forces and		

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	moments by the cross sections of the beam and draw the corresponding N, Q & M diagrams		
	I6: Calculate the position of the center of gravity of lines, surfaces, bodies, and complex figures		
	I7		
	I8		
	I9		
	I10		
Alternative formation of the grade (I1 – I6)	**or** alternative formation of the grade : I1 - I6 The acquired knowledge is tested upon completion of the final exam, which consists of two parts: a practical (written) exam containing 4 tasks and a theoretical (written and / or oral) exam consisting of 4 questions that include practical examples. Exams can only be taken by students who have a quota of previous activities during the semester (attendance at lectures and tutorials in the amount of at least 80% of the scheduled hourly rate). To pass the practical(written) part of the exam, it is necessary to reach 51% of the correct solutions. The practical part of the exam is elimination, the condition for entering the final part of the exam is positively evaluated, and it becomes valid only after the theoretical part of the exam has been passed. Students who have passed the practical part of the exam pass the theoretical part of the exam. Theoretical examination is a written and / or oral examination consisting of 4 questions, each with a practical example on which to explain the theory. For a positive evaluation, at least 2 of the 4 questions offered must be answered correctly. The final grade for the course consists of the following elements: 1. written exam = 60% of final grade (60 marks) 2. oral exam = 40% of final grade (40 points)		TOTAL: 100 points
Students' competencies			

Prerequisites for course approval (lecturer's signature):	attendence 80%
Prerequisites for taking exams:	Lecturer signature
Grading scale:	(According to the Regulations on student assessment of Karlovac University of Applied Sciences, Article 9, Paragraph 5) 90-100 - excellent (5) (A) 80 to 89.9 - very good (4) (B) 65 to 79.9 - good (3) (C) 60 to 64.9 - sufficient (2) (D) 50 to 59.9 - sufficient (2) (E) 0 to 49.9 – fail (1) (F)

ECTS structure

ECTS credits allocated to the course reflect the total burden to the student during adoption of the course content. Total contact hours, relative gravity of the content, effort required for exam preparation, as well as, every other possible burden are taken in account:

Attendance (active participation)	Term paper	Composition	Presentation	Continuous assessment and evaluation	Practical work
1					
Independent work	**Project**	**Written exam**	**Oral exam**	**Other**	
		2	2		

Review of topics/units per week associated with learning outcomes

Week	Lectures topics/units and learning outcomes:	Tutorials topics/units and learning outcomes:
1.	Introduction to statics, the basis of vector calculus, the concept of force and rigid body	The equilibrium of the plane system of forces intersecting at one point
2.	Separation of force into components in plane and space	The equilibrium of the spatial system of forces intersecting at one point
3.	A system of forces that intersect at one point, the equilibrium of a system of forces	The equilibrium of body in the plane
4.	Bonding reactions, isolation of the body from the mechanical system	The equilibrium of body in the space
5.	Static moment of force, Varignon's theorem	Sliding friction - application of Coulomb's law
6.	Parallel forces, coupling forces, force reduction to a given point	Rope Friction - application of the Euler equation, rolling friction
7.	Analytical and vectorial conditions of body equilibrium, spatial and plane systems of forces	Brakes-applying of Coulomb's law & Euler equation
8.	The term friction, sliding friction	The equilibrium of body in the plane and spatial
9.	Rope friction and rolling friction	Truss girders
10.	Truss girders: determination of forces in rods	Truss girders
11.	Beams- basic concepts, directions of internal forces and moments	Beams
12.	Determination of transverse and longitudinal forces and bending moments along the beam	Beams
13.	Drawing diagrams of forces and moments	Gerber's beam
14.	Gerber's beam	The center of gravity of lines, surfaces, bodies, and complex figures
15.	The center of gravity of lines, surfaces, bodies, and complex figures	Exam Example

References

REFERENCES (compulsory/additional):
Compulsory:
1.) O. Muftić , Statika , Tehnička knjiga, Zagreb ,1991.
2.) F. Matejiček , Statika sa zbirkom zadataka,Goldenmarket Zagreb ,1999.
3.) D.Bazjanac , Zbirka zadataka iz Statike,Tehnička knjiga Zagreb,1970.
4.) N.Lorković, Zbirka riješenih zadataka iz Statike,Veleučilište u Karlovcu, 2022.
Additional:
1.) J. Brnić,Mehanika i elementi konstrukcija,Školska knjiga, Zagreb,1993.
2.) D.Bazjanac,Statika,Tehnička knjiga Zagreb,1970.

Exams for the academic year: __2022/2023__

Exam dates:	According to the schedule of exams for academic year 2022/2023

Contact information

1. Course Instructor/Lecturer:	NENAD LORKOVIĆ
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Office hours / Consultations:	According to the schedule for academic year 2022/2023. Cabinet 1 (M 001) , Ivana Meštrovića 10
2. Course Instructor/Lecturer:	
e-mail:	
Office hours / Consultations:	