POZNAN UNIVERSITY OF TECHNOLOGY

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Engineering mechanics I [N1MiBP1>MT1]

Course

Field of study	Year/Semester
Mechanical and Automotive Engineering	1/2
Area of study (specialization)	Profile of study
–	general academic
Level of study	Course offered in
first-cycle	polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
18	0	0
Tutorials	Projects/seminars	
18	0	

Number of credit points

4,00

Coordinators

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Lecturers

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Prerequisites

Basic knowledge of mathematics in the field of vector, differential and integral calculus and physics in the field of mechanics The ability to think logically and creatively, to use internet and library resources The student understands the need for continuous learning and gaining new knowledge

Course objective

Presentation of the basics of statics, kinematics, enabling further study of issues in the field of the basics of machine construction, theory of machines and mechanisms and mechanics of materials.

Course-related learning outcomes

Knowledge:
Has knowledge in the field of mathematics, including algebra, analysis, theory of differential equations, probability, analytical geometry necessary to: describe the operation of discrete mechanical systems, understand computer graphics methods, describe the operation of electrical and mechatronic systems.

Has ordered basic knowledge of the main divisions of technical mechanics: statics, kinematics and dynamics of a material point and a rigid body.
Has basic knowledge of the basics of machine design and the theory of machines and mechanisms, including mechanical vibrations.

Skills:
Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.
Can use learned mathematical theories to create and analyze simple mathematical models of machines and their elements, and simple technical systems.
Can competently advise on the selection of a machine for a given application in the industry covered by the selected diploma path based on the acquired knowledge about a given group of machines.

Social competences:
Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on his own.
Is willing to think and act in an entrepreneurial manner.
Is ready to fulfill professional roles responsibly, including:
- observing the rules of professional ethics and requiring this from others,
- caring for the achievements and traditions of the profession.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Passing the lecture on the basis of a test
Passing exercises on the basis of systematic tests

Programme content

Selected problems from vector algebra. Axioms of statics. Supports and their reactions. The rigid fixing. Friction and the laws of friction,sliding friction, rolling friction, friction of elastic belts. Convergent system of forces: reduction of the system, equilibrium conditions, theorem of three forces. A couple of forces. A system of forces: reduction of the system, equilibrium conditions. Distributed force systems. Special cases of a system of forces. Statically determinate and statically indeterminate systems. Flat trusses. Static moments. Centers of gravity of solids, surfaces and lines. Kinematics of point, equations of motion, velocity and acceleration. Movement of a point in the Cartesian, natural and polar coordinate systems. Velocity and acceleration of a body. Special cases of general body motion: translational, parallel to a fixed plane, motion with a fixed point, and rotation of a rigid body about a fixed axis. Relative point motion.

Teaching methods

Lectures: multimedia presentation with theory and examples
Classes: problem solving

Bibliography

Basic
1. Sałata W., Mechanika ogólna w zarysie, Poznań, Wyd. PP 1998.
2. Leyko J., Mechanika ogólna. T. 1, Warszawa, PWN 2008.
3. Misiak J., Mechanika ogólna. T. I , Warszawa, WNT 1995.
4. Misiak J. Zadania z mechaniki ogólnej. Część I i II, Warszawa, WNT 1994.
5. Nizioł J. Metodyka rozwiązywania zadań z mechaniki. Warszawa, WNT 2002.
6. Mieszczerski I. W., Zbiór zadań z mechaniki. Warszawa, PWN 1969.
Additional
1. Osiński Z. Mechanika ogólna. Warszawa, PWN 2000.
2. Awrajcewicz J. Mechanika techniczna, Warszawa WNT 2009

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	36	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	64	2,00