



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technical mechanics

Course

Field of study

Power Engineering

Area of study (specialization)

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

10

Laboratory classes

10

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

Prof. dr hab. inż. Janusz Mielniczuk

email: janusz.mielniczuk@put.poznan.pl

tel. 61 665 2335

Wydział Inżynierii Mechanicznej

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

dr inż. Maciej Berdychowski

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tel. 61 224 4512

Wydział Inżynierii Mechanicznej

ul. Piotrowo 3, 60-965 Poznań

Prerequisites

Knowledge from the lectures in mathematics, physics, technical mechanics.

Applying the learned laws and principles of mechanics in solving simple problems of statics, kinematics, dynamics and durability

Course objective

Learning about selected problems of technical mechanics in order to use them in the processes of independent solving of complex tasks and mechanical design.

Course-related learning outcomes

Knowledge



Has extended knowledge of modeling of mechanical systems; strength analysis of basic mechanical constructions.

Skills

Is able to assess the suitability and selection of the calculation method, use or implement appropriate software appropriate to solve a given problem, taking into account the new achievements of technology and technology.

Social competences

Is ready to critically assess and analyze issues and recognizes the importance of knowledge in solving cognitive and practical problems in the field of energy.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

- lecture - written test

- laboratory exercises - credit on the basis of grades from reports and a written check of the level of preparation for each class

Programme content

Lecture: Selected elements of statics; cranes, geometry of masses. Kinematics of complex motion, kinematics and dynamics of simple mechanisms, dynamic equations of motion of a mechanical system, mechanical vibrations. Strength and deformation of structures with complex loads; deflections of beams, buckling of columns, calculation of thin-walled tanks, fatigue strength.

Laboratories: A complex state of stress. Static and dynamic measurements. Measurements of variable speeds over time on the example of a cross-spherical articulated coupling. Torque measurements. Determination of critical rotations of shafts. Determination of the natural frequency. Static tensile test.

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board.

Laboratory exercises: performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

J. Kubik, J. Mielniczuk: Mechanika techniczna dla inżynierów, Wyd. UKW, Bydgoszcz 2017

J. Misiak: Mechanika techniczna, tomy I i II, WNT, Warszawa 1997, 2006

M. Banasiak (red.): Ćwiczenia laboratoryjne z wytrzymałości materiałów, PWN, Warszawa 2000

Additional

J. Rzyśko: Statyka i wytrzymałość materiałów, PWN, Warszawa 1971



R. Bąk, A. Stawinoga: Mechanika dla niemechaników, WNT, Warszawa 2009

Mały poradnik mechanika, praca zbiorowa, WNT

Breakdown of average student's workload

	Hours	ECTS
Total workload	80	3,0
Classes requiring direct contact with the teacher	25	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	55	2,0

¹ delete or add other activities as appropriate