



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Mechanics

Course

Field of study

Security engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

Other (e.g. online)

Tutorials

15

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

It has basic knowledge of mathematics and physics. It can think logically and it can obtain informations from source literature. It understands the need to learn and acquire new knowledge and new skills.



Course objective

Getting theoretical and practical foundations in the field of mechanics, used to solve selected technical problems.

Getting a basic knowledge of engineering computations covering the area of technical mechanics.

Getting skills to interpret results and formulate conclusions

Course-related learning outcomes

Knowledge

The student knows the issues concerning engineering problems (physics, chemistry, materials science, manufacturing technology, strength of materials, mechanics) - [P6S_WG_01]

The student has basic knowledge about the life cycle of products, devices, objects, systems and technical systems - [P6S_WG_06]

The student knows the issues of quality engineering in relation to products and processes - [P6S_WG_07]

Skills

The student is able to properly select sources and information derived from them, make an assessment, critical analysis and synthesis of this information - [P6S_UW_01]

The student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks, also with the use of information and communication methods and tools. Can interpret the results of the analysis made and draw conclusions that follow from it.- [P6S_UW_04]

The student is able to make a critical analysis of the way of functioning and assess - in connection with Safety Engineering, the existing technical solutions, in particular machines, devices, objects, systems, processes and services - [P6S_UW_06]

Social competences

The student is able to see the cause-and-effect relationships in the implementation of the set goals and rank the significance of alternative or competitive tasks - [P6S_KK_01]

The student is aware of the responsibility for their own work and readiness to submit to the rules of working in a team and bearing responsibility for jointly performed tasks - [P6S_KR_02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Knowledge acquired during the lectures is verified at the final written exam. The pass threshold is 50 % of the total points.

Tutorials: assessment issued on the basis of current knowledge control in the form of tests and/or answers. Credit for a positive grade after obtaining at least 50% of the total points.

Programme content



Statics:- Principles of statics, bonds and the reactions, theorem on three forces, equilibrium of convergent system of forces, equilibrium of set of forces with lines of action lying in one plane, lattices, equilibrium of three-dimensional system of forces, friction, center of gravity

Kinematics of point: the movement of point (velocity and acceleration) of absolute and natural coordinate system. Kinematics of rigid body.

Dynamics of material point: Newton's rules, dynamic equations of movement of a material point

Laws of movement of a point and set of material points: Momentum and angular momentum. Work, power and energy. Potential field of forces and principle of mechanical energy conservation

Dynamics of rigid body: The geometry of mass (static moment, the center of mass and moment of inertia of body). Momentum and angular momentum of rigid body. Dynamic equations of movement of a rigid body.

Teaching methods

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

Classes: solving tasks on the board - practical exercises and discussion

Bibliography

Basic

J. Leyko, Mechanika ogólna, t. 1 i 2, PWN, Warszawa, 2000

J. Misiak, Mechanika ogólna, tom I i II, PWN, Warszawa, 1969

J. Misiak, Zadania z mechaniki ogólnej, t. 1 2 3, WNT, Warszawa, 1992

W. Biały, Metodyczny zbiór zadań z mechaniki, WNT, Warszawa, 2004

J. Nizioł, Metodyka rozwiązywania zadań z mechaniki, WNT, Warszawa 2002

Additional

Z. Osiński, Mechanika ogólna, PWN Warszawa 1994

M. E. Niezgodziński, T. Niezgodziński, Zbiór zadań z mechaniki ogólnej, PWN, Warszawa 2008

I.W. Mieszczerski, Zbiór zadań z mechaniki, PWN, Warszawa 1969



Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests and final exam) ¹	25	1,0

¹ delete or add other activities as appropriate