



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

Tutorials

15

Laboratory classes

Projects/seminars

Other (e.g. online)

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

prof. dr hab. inż. Janusz Mielniczuk

Responsible for the course/lecturer:

dr inż. Bartosz Wieczorek

Prerequisites

Basic knowledge of mathematics and physics.

Course objective

Teaching theoretical and practical foundations in the field of mechanics, used to solve selected technical problems. To acquaint students with the practical application of the laws of mechanics. Developing the skills of mathematical notation of simple mechanical systems.

Course-related learning outcomes

Knowledge

1. Student has knowledge of mechanics including balance of forces, friction, translational, rotary and flat



movement, stretching, compression and torsion of rods, internal, normal and cutting forces, and bending moments. - [K1A_W07]

2. The student has basic knowledge about the life cycle of products, devices, objects, systems and technical systems. - [K1A_W19]

3. Student knows the basic methods and techniques used in technology. - [K1A_W23]

Skills

1. Student is able to obtain, integrate, interpret information from literature, databases and other properly selected sources, also in English or another foreign language recognized as a language of international communication in the field of Security Engineering; and to draw conclusions and formulate and justify opinions. - [K1A_U01]

2. Student is able to use analytical and simulation methods to formulate and solve engineering tasks - [K1A_U09]

3. Student is able to make a critical analysis of the functioning and evaluate existing technical solutions, in particular machines, devices, objects, systems, processes and services. - [K1A_U13]

Social competences

1. The student is aware of the responsibility for their own work and readiness to comply with the principles of teamwork and taking responsibility for jointly implemented tasks. - [K1A_K03]

2. The student is able to see cause-and-effect relationships in achieving the set goals and rank the importance of alternative or competitive tasks. - [K1A_K04]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture - exam, exercises - colloquium

Programme content

The subject is divided into three sections: statics, kinetics and dynamics. As part of statics, the vector calculus, balance of force systems (convergent, parallel and arbitrary), static friction analysis are discussed. As part of kinematics, movements on various trajectories and complex motion phenomena, including flat motion, are discussed. As part of dynamics, the general equation of dynamics is discussed and the dynamics of basic mechanical systems formulated on its basis.

Teaching methods

Lecture - multimedia presentation, examples discussed on the board. Exercises - examples of tasks solved on the board by the teacher and independently by the students.

Bibliography



Basic

1. J. Kubik, J. Mielniczuk, A. Wilczyński, Mechanika techniczna, PWN, Warszawa 1983.
2. R. Bąk, A. Stawinoga, Mechanika dla niemechaników, WNT, Warszawa 2009.

Additional

1. J. Rzyśko, Statyka i wytrzymałość materiałów, PWN, Warszawa 1971.
2. J. Leyko: Mechanika ogólna, PWN, Warszawa 1971.
3. Mały poradnik mechanika, praca zbiorowa, WNT.

Breakdown of average student's workload

	Hours	ECTS
Total workload	86	3
Classes requiring direct contact with the teacher	49	2
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	15	1

¹ delete or add other activities as appropriate

