



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Engineering Mechanics

Course

Field of study

Mechanical Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

15

Tutorials

15

Laboratory classes

15

Projects/seminars

Other (e.g. online)

Number of credit points

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Roman Starosta

email: roman.starosta@put.poznan.pl

Faculty of mechanical Engineering

CMBiN, room 437

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of physics and mathematics, vector calculus, calculus



Course objective

Providing students with basic knowledge of engineering mechanics, in the field of statics, kinematics and dynamics, which will enable them to study further subjects

Course-related learning outcomes

Knowledge

Student has knowledge in physics, covering the basics of classical mechanics, necessary to understand issues in the field of materials science, theory of machines and mechanisms, theory of drives and mechatronic systems,

has basic knowledge of the main areas of technical mechanics: statics, kinematics and dynamics of the material point and rigid body.

Skills

Student has the ability to self-study using modern teaching tools, such as remote lectures, websites, databases, e-books, etc.

is able to obtain information from literature, the internet, databases and other sources, is able to integrate obtained information, interpret and draw conclusions from it

can create a free-body diagram, select elements and perform basic calculations of the mechanical system.

Social competences

Student is able to properly set priorities for implementation of the task specified by himself or others based on available knowledge,

understands the need for critical assessment of knowledge and continuous education

is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the associated responsibility for decisions made.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written egzam verifying proper understanding of the concepts of engineering mechanics (9 theoretical questions and 4 problems to solve)

Tutorials: tests and assessment of classroom activity

Programme content

Kinematics including: kinematics of a rigid body, complex motion, linkage with sliding contact.

Dynamics: equation of motion of the material point and the rigid body, tensor of inertia, vibration of the one degree of freedom system, mathematical and physical pendulum, momentum, moment of momentum, energy, work, power, field of forces, dynamical reaction forces



Teaching methods

Lecture: multimedia presentation illustrated by the examples given on the blackboard

Tutorial: solving of the mechanical problems on the blackboard, discussion

Bibliography

Basic

1. J.Leyko, Mechanika ogólna, tom I i II, PWN, Warszawa, 2008
2. J.Misiak, Mechanika techniczna, tom I i II, WNT, Warszawa, 1996
3. M.Łunc, A.Szaniawski, Zarys mechaniki ogólnej, PWN, Warszawa, 1959
4. J.Misiak, Zadania z mechaniki ogólnej, Część I, II i III, Warszawa, WNT 2009
5. J.Nizioł, Metodyka rozwiązywania zadań z mechaniki, Warszawa, WNT 2007

Additional

1. A.Bedford, W.Fowler, Engineering mechanics, Prentice Hall, New Jersey, 2002
2. D.J.McGill, Engineering Mechanics, PWS Publishers, Boston, 1985
3. J.Awrejcewicz, Mechanika techniczna, Warszawa WNT 2009
4. M.T.Niezdziński, Zbiór zadań z mechaniki ogólnej, Wydawnictwo Naukowe PWN, Warszawa, 2009

Breakdown of average student's workload

| | Hours | ECTS |
|---|-------|------|
| Total workload | 110 | 5,0 |
| Classes requiring direct contact with the teacher | 60 | 3,0 |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹ | 50 | 2,0 |

¹ delete or add other activities as appropriate