



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Strength of materials

Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/4

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

Tutorials

Projects/seminars

Other (e.g. online)

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

dr inż. Piotr Stasiewicz

Responsible for the course/lecturer:

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Wydział Inżynierii Mechanicznej

ul. Piotrowo 3, 60-965 Poznań

Prerequisites

Solving basic problems of technical mechanics.

Solving statically determinate problems of strength of materials.

Ability to search for necessary information in literature, databases, catalogues. The ability to self-study.

Using information and communication techniques appropriate to carry out engineering tasks.

Course objective

Introduction to the basic principles of mechanics of deformable bodies.



Course-related learning outcomes

Knowledge

1. The graduate has a basic knowledge of metal materials used in mechanical engineering, in particular their mechanical properties, and factors affecting their strength.
2. The graduate has a basic knowledge of the rigid body.
3. The graduate has basic knowledge in the field of strength of materials, including the basics of the theory of elasticity and plasticity, strain hypotheses, methods for calculating structural elements in simple load states, as well as methods for testing strength of materials and the state of deformation and stress in structures.

Skills

1. Has the ability to self-study using websites.
2. Can use mobile engineering applications, formulas and strength tables.
3. Is able to analyze technical solutions and assess their suitability for use in their own technical projects.

Social competences

1. Has awareness of the importance of professional ethics behavior.
2. Understands the need for lifelong learning.
3. Has understanding and knows the non-technical aspects and effects of engineering activities and the related responsibility for decisions.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture - written test and assessment of activity in the classroom:

3 50.1% -70.00%

4 70.1% -90.0%

5 from 90.1%

Programme content

Tension and compression within the limits of elasticity, the statically indeterminate bar systems.

Basics of strength calculations in the plastic range.

Torsion of thin-walled bars.

Shear stresses in beams.

Beam Design. Generalized Clebsch method (Macaulay's method).



Statically indeterminate beams.

PART - 66 (THEORY - 11.25 hours)

MODULE 6. MATERIALS AND EQUIPMENT

6.2 Non-ferrous aircraft construction materials

b) Testing of non-ferrous materials for hardness, toughness

tensile strength, fatigue strength and impact strength. [1]

Statically indeterminate beams.

Teaching methods

Live lecture with multimedia illustrations and examples of solutions.

Bibliography

Basic

1. J. Zielnica, Wytrzymałość materiałów, str. 554, WPP, wyd. III, Poznań 2000
2. Z. Dyląg, A. Jakubowicz, Z. Orłoś, Wytrzymałość materiałów, WNT, Warszawa, 2012
3. K. Magnucki, W. Szyca, Wytrzymałość materiałów w zadaniach, PWN, 1987

Additional

1. N. Willems, T. J. Easley, S. T. Rolfe, Strength of Materials, Mc Graw-Hill Book Company, 1981
2. M. Gere, S. Timoshenko, Mechanics of Materials, PWS-Kent Publishing Company, Boston, 1984

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	20	0,7
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests) ¹	10	0,3

¹ delete or add other activities as appropriate