



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Strength of materials [N1Bud1>WM1]

Course

Field of study

Civil Engineering

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

Number of hours

Lecture

20

Laboratory classes

0

Other

0

Tutorials

20

Projects/seminars

10

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

Knowledge: Mathematics: basic algebra, calculus, geometry, planimetry, trigonometry; Mechanics: knowledge about equations of equilibrium and internal forces in beams and frames. Skills: Mathematics: calculation of derivatives; Physics: usage of Newton's laws of motion; Mechanics: calculation of reactions and internal forces in statically determinate beams and frames. Social competencies: Student can work in team. Student acts according to ethical rules.

Course objective

The objective is to gain knowledge, skills and competences in basic design of 2D beams and frames.

Course-related learning outcomes

Knowledge:

Student knows the rules of the theory of structures and static analysis of 2D systems of beams and frames (lecture).

Skills:

Student can derive geometric characteristics of 2D cross-sections (classes and projects).

Student can calculate stress and strain fields in an arbitrary point of bar's cross-section in 2D beams and frames (classes and projects)

Student can calculate an area of reinforcement in reinforced concrete beam with a rectangular cross-section (classes and projects).

Social competences:

Student is responsible for reliability of his results. Student is ready to get a critical feedback about the results of his work.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Lectures - exam which consists of two parts. The basis for passing the lecture is receiving more than 50% of points from each of exam parts. Final mark is calculated based on the sum of points from both exam parts. Marks scale: very good (5,0), good + (4,5), good (4,0), sufficient + (3,5), sufficient (3,0), insufficient (2,0)

Classes - single test at the end of semester. The basis for passing the class is receiving more than 50% of points. Marks scale: very good (5,0), good + (4,5), good (4,0), sufficient + (3,5), sufficient (3,0), insufficient (2,0)

Projects - 5 separate individually evaluated assignments. The basis for passing the projects is receiving more than 50% of points from all the assignments. Marks scale: very good (5,0), good + (4,5), good (4,0), sufficient + (3,5), sufficient (3,0), insufficient (2,0)

Programme content

Lecture:

1. Diagrams of internal forces in 2D beams and frames.
2. Geometric characteristics of cross-sections.
3. Analysis of stress and strain states in cross-sections.
4. Basic design of reinforced concrete beams.

Classes:

1. Diagrams of internal forces in 2D beams and frames.
2. Geometric characteristics of cross-sections.
3. Analysis of stress and strain states in cross-sections.

Projects:

1. Diagrams of internal forces in 2D beams and frames.
2. Geometric characteristics of cross-sections.
3. Analysis of stress and strain states in cross-sections.

Course topics

Lecture:

1. Diagrams of internal forces in 2D beams and frames.
2. Geometric characteristics of cross-sections.
3. Analysis of stress and strain states in cross-sections.
4. Basic design of reinforced concrete beams.

Classes:

1. Diagrams of internal forces in 2D beams and frames.
2. Geometric characteristics of cross-sections.
3. Analysis of stress and strain states in cross-sections.

Projects:

1. Diagrams of internal forces in 2D beams and frames.
2. Geometric characteristics of cross-sections.
3. Analysis of stress and strain states in cross-sections.

Teaching methods

Informative lecture

Exercises - solving exercises

Projects - solving homework assignments

Bibliography

Basic

Janusz Dębiński, Justyna Grzymisławska, Wytrzymałość materiałów, części 1-3, Wydawnictwo Politechniki Poznańskiej, 2019.

Janusz Dębiński, Justyna Grzymisławska, Powszechna mechanika płaskich konstrukcji prętowych, części 1-3, Wydawnictwo Politechniki Poznańskiej, 2019.

Additional

Andrzej Gawęcki, Mechanika materiałów i konstrukcji prętowych, części 1-2, Wydawnictwo Politechniki Poznańskiej, 1998.

Breakdown of average student's workload

	Hours	ECTS
Total workload	175	7,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	125	5,00