



## 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 (e.g. online)

0

Tutorials

20

Projects/seminars

10

### Number of credit points

4,00

### Coordinators

dr inż. Janusz Dębiński prof. PP  
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### Lecturers

dr inż. Janusz Dębiński prof. PP  
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dr inż. Justyna Grzymisławska prof. PP  
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### 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.

## 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, Postawy mechaniki 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