# 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
janusz.debinski@put.poznan.pl

## 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 consits of two parts. The basis for passing the lecture is recieving 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 recieving 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 indiviually evaluated assignments. The basis for passing the projects is recieving 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
Excercises - solving excercises
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 |