POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Strength of materials

Course

Field of study	Year/Semester
Civil Engineering first-cycle studies	1/2
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
part-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
18	0	
Tutorials	Projects/seminars	
18	10	

Number of credit points

7

Lecturers

Responsible for the course/lecturer:	Responsible for the course/lecturer:
dr inż. Janusz Dębiński	dr inż. Justyna Grzymisławska
janusz.debinski@put.poznan.pl	justyna.grzymislawska@put.poznan.pl
+48 61 665 2072	+48 61 665 2172
Wydział Inżynierii Lądowej i Transportu	Wydział Inżynierii Lądowej i Transportu
ul. Piotrowo 5, 60-965 Poznań	ul. Piotrowo 5, 60-965 Poznań

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;

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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:

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.

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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.

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Breakdown of average student's workload

	Hours	ECTS
Total workload	175	7,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	125	5,0

[1] delete or add other activities as appropriate