COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mechanics 2 [S1Arch1E>MECH2]

Course

Field of study
Architecture

Year/Semester
1/2

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
30

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

1 Knowledge: Knowledge of the statics of beams, simple frames and trusses and geometrical characteristics of sections. 2 Skills: Calculating reactions, shear forces, normal forces and bending moments in simple beams and statically determinate frames. Determination of forces in bars of statically determinate trusses. Calculation of the geometrical characteristics of plane figures - center of gravity, moments of inertia. 3 Social competencies: student is aware of the responsibility for the engineering calculations made.

Course objective

1. Preparation for the design and calculation of simple and complex building structures.

Course-related learning outcomes

Knowledge:
Student knows und understands:
B.W4. mathematics, space geometry, statics, material strength, shaping, construction and dimensioning of structures, to the extent necessary to formulate and solve tasks in the field of architectural and urban design;

B.W5. issues of construction, construction technologies and installations, construction and building physics, covering key issues in architectural, urban and planning design as well as issues related to fire protection of buildings;

Skills:
Student can:
B.U4. develop solutions for individual building systems and elements in terms of technology, construction and materials;

Social competences
Student is capable of:
B.S2. reliable self-assessment, formulating constructive criticism regarding architectural and urban planning activities.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

1. Two tests during the semester.
2. Four design works to be passed, checked by the teacher, with active consultations.
Formative assessment:
Assessment of knowledge, computational skills and projects carried out during exercises. Final grading scale: 2.0; 3.0; 3.5; 4.0; 4.5; 5.0
Summative assessment:
The grade obtained during written tests and design works as well as the grade from the oral answer concerning the lectures.
Assessment scale: 2,0; 3.0; 3.5; 4.0; 4.5; 5.0
Lecture:
Formative assessment:
periodic control of learning progress, active participation in classes
Accepted grading scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0.
Percentage of grades: 0–50% - 2.0 (insufficient); 50-60% - 3.0 (sufficient); 60-70% - 3.5 (sufficient plus); 70-80% - 4.0 (good); 80-90% - 4.5 (good plus); 90-100% - 5.0 (very good).
Summative assessment:
a final test or (if an exam is included in the curriculum) a written exam
Accepted grading scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0.
Percentage of grades: 0–50% - 2.0 (insufficient); 50-60% - 3.0 (sufficient); 60-70% - 3.5 (sufficient plus); 70-80% - 4.0 (good); 80-90% - 4.5 (good plus); 90-100% - 5.0 (very good).

Tutorials:
Formative assessment:
periodic control of learning progress (tests), active participation in classes
Accepted grading scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0.
Percentage of grades: 0–50% - 2.0 (insufficient); 50-60% - 3.0 (sufficient); 60-70% - 3.5 (sufficient plus); 70-80% - 4.0 (good); 80-90% - 4.5 (good plus); 90-100% - 5.0 (very good).
Summative assessment:
a final test
Accepted grading scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0.
Percentage of grades: 0–50% - 2.0 (insufficient); 50-60% - 3.0 (sufficient); 60-70% - 3.5 (sufficient plus); 70-80% - 4.0 (good); 80-90% - 4.5 (good plus); 90-100% - 5.0 (very good).

Programme content

Calculation of stresses for different types of loading. Design of elements for tension, bending and columns with the phenomenon of buckling. Calculation of reactions in statically indeterminate systems.

Course topics

Elastic, plastic and strength properties of construction materials. Designing construction with compression and tension. Normal and shear stresses calculations in bending for statically determinate beams and frames. Design of sections of beams and frames. Calculation of stresses in elements loaded eccentrically.

Deflections of bending beams. Buckling of columns - critical forces and stresses. Simple statically indeterminate systems - calculation of beams and frames using the force method.

Teaching methods

1. Lecture.
2. Exercises based on the study of specific examples.
3. Projects - calculation example individual for each student, with active consultations with the teacher of the subject.
4. eLearning Moodle (a system supporting the teaching process and distance learning).

Bibliography

Basic
1. Kenneth R. Lauer, Structural engineering for architects, McGraw-Hill Book Company 1981
2. Philip Garrison, Basic structures for engineers and architects, Blackwell Publishing 2005

Additional:
1.Sygulska A., Spatial modifications of the stage of the opera house for the needs of a concert, 3(39) Architectus 2014.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00