



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Sustainable building [S1BZ1E>BZ]

### Course

Field of study

Sustainable Building Engineering

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

English

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

30

### Number of credit points

6,00

### Coordinators

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### Lecturers

### Prerequisites

Knowledge, skills and competences acquired during the education process. The ability to formulate and solve technical problems in the field of civil engineering.

### Course objective

To acquaint students with the current problems of building engineering in the design and implementation and construction of buildings.

### Course-related learning outcomes

Knowledge:

1. The student has extended and detailed knowledge of material strength, modelling and constructing; have knowledge of theoretical principles of the finite element method as well as general rules of non-linear calculations of engineering structures. (KB\_W04)
2. The student knows in detail the rules of design, construction and operation of selected building units.

(KB\_W07)

#### Skills:

1. The student is able to correctly define a computational model and carry out an advanced linear analysis of complex building units, their elements and connections; is able to apply basic nonlinear computational techniques together with a critical evaluation of numerical analysis results. (KB\_U05)
2. The student is able to dimension complex construction details of selected elements of building structures. (KB\_U07)

#### Social competences:

1. The student is ready to autonomously complete and broaden (extend) knowledge in the field of modern processes and technologies of building engineering. (KB\_K03)
2. The student can realise that it is necessary to improve professional and personal competence; is ready to critically evaluate the knowledge and received content. (KB\_K05)

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Passing the lectures on the basis of a positive grade (minimum 3.0) of the final written test. The condition for passing the design exercises is correct and timely execution of the design task and positive defense of the design.

### Programme content

Technical solutions in the field of general construction - discussion of the key elements of the building and the technical solutions used.

Analysis of the causes of construction failures.

Design of buildings in the field of general construction.

### Course topics

#### Lectures

1. Timber roof structures
2. Ceilings and flat roofs
3. Masonry structures
4. Lintels, beams, reinforced concrete columns
5. Foundations
6. Stair structures
7. Failures of building structures, methods of repairing building structures

#### Assessment

#### Projects

1. Preliminary information, determining the scope of the project.
- 2-3. Shaping construction solutions
- 4-5. Static calculations and construction drawings of the roof truss
- 6-7. Static calculations and construction drawings of ceilings
- 8-9. Static calculations and construction drawings of reinforced concrete elements
- 10-11. Static calculations and construction drawings of steel elements
- 12-13. Static calculations and construction drawings of foundations
- 14-15. Defense and evaluation of the project

### Teaching methods

Lectures: informative, problem lecture, case study method

Projects: project method

### Bibliography

#### Basic

1. Przemysław Markiewicz, Budownictwo ogólne dla architektów, ARCHI-PLUS, Kraków 2011

2. Poradnik majstra budowlanego, ARKADY.
3. Wacław Żenczykowski, Budownictwo ogólne tom 2/1.
4. Rozporządzenie w sprawie warunków technicznych, jakim powinny odpowiadać budynki i ich usytuowanie.
5. Ustawa Prawo budowlane
6. Eurocodes.

Additional

1. Manufacturers" technical materials for the design and assembly of building elements
2. Technical sheets of building materials.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	90	6,00
Classes requiring direct contact with the teacher	45	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	3,00