



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Masonry structures [S1BZ1E>KM]

### Course

Field of study

Sustainable Building Engineering

Year/Semester

2/3

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

10

Laboratory classes

0

Other

0

Tutorials

30

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

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### Lecturers

### Prerequisites

A student beginning this course should have basic knowledge of mathematics, basic mechanics and building materials. The student should have skills in performing calculations of tasks in physics and using available sources of information.

### Course objective

To provide students with basic knowledge of masonry constructions, including: construction, nature of construction work and dimensioning principles. Developing in students the skills of dimensioning of masonry structures.

### Course-related learning outcomes

Knowledge:

1. Student knows the rules of construction and dimensioning of elements and connections of masonry structures
2. Student knows the most common building materials (in masonry constructions) and assembly rules

Skills:

1. Student is able to calculate a set of loads acting on buildings
2. Student is able to design selected elements and simple masonry constructions
3. Student is able to use selected computer programs to support design decisions in sustainable construction

Social competences:

1. Student is responsible for the integrity of his work and its interpretation

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lectures is verified by two 45-minute colloquia during the 3rd and 5th lectures. Each colloquium consists of questions (test or open), scored differently.

Grade 5,0  $\geq$  90%, 4,5  $\geq$  80%, 4,0  $\geq$  70%, 3,5  $\geq$  60%, 3,0  $\geq$  50%.

Assessment issues on the basis of which the questions are developed will be made available to students via the eKursy platform.

In the case of e-learning, it is possible to change the way of passing lectures in quizzes on the eKursy platform.

The points obtained from individual quizzes are added up and the final grade is determined based on them.

Scoring - rating

20-21 - 5.0

18-19 - 4.5

16-17 - 4.0

14-15 - 3.5

12-13 - 3.0

0-11 - 2.0

The skills acquired during the exercises are verified on the basis of ongoing verification of the correctness of the calculations performed in the exercise book. Correctly performed calculations on time - grade 5.0, performed after the deadline - grade 4.5 or 4.0 (depending on time), minor calculation errors - grade 3.0. Completing additional tasks gives you the opportunity to increase your grade.

### Programme content

Lectures:

Collection of loads according to Eurocodes.

History and types of masonry structures.

Characteristics of masonry structure elements.

Masonry construction systems.

Dimensioning of unreinforced masonry structures according to Eurocodes.

Structural requirements for masonry structures.

Exercises:

Checking the load-bearing capacity of a brick pillar.

### Course topics

Lectures:

Collection of loads according to Eurocodes:

- permanent, live and snow loads,

- wind loads, load combinatorics.

History and types of masonry structures: walls, arches, vaults, post and beam.

Characteristics of masonry construction elements in the past and today: masonry elements, mortars

Masonry construction systems: aerated concrete, silicate, ceramics, clinker facades, reinforced masonry.

Dimensioning of unreinforced masonry structures according to EC: loaded mainly vertically

Dimensioning of unreinforced masonry structures according to EC: simplified dimensioning methods, dimensioning of structures loaded with concentrated force.

Structural requirements for masonry structures, guidelines for the execution and acceptance of masonry works.

Exercises:

Checking the load-bearing capacity of a wall pillar - calculations carried out (independently or in a team) in a notebook: Siewczyńska M. Workbook for design of masonry Structures. Simplified method, Wydawnictwo

## Teaching methods

Lectures - informative lecture with multimedia presentation

Exercises: working with book, project and exercise methods - alone or in teams, exposition

## Bibliography

Basic

1. Hendry A. W., Sinha B. P., Davies S. R., Design of masonry structures Third edition of load bearing brickwork design (internet)
2. Siewczynska M., Workbook for design of masonry structures, Wydawnictwo ApuntoPress, Poznań, 2019
3. How to design masonry structures using Eurocode 6 (pdf)

Additional

1. Hall Loretta, Historic bricks, rap air or replace, Concrete Decor and PaintPRO Magazines
2. Penazzi D., Valluzzi M.R., Saisi A., Binda I., Modena C., Repair and strengthening of historic masonry buildings in seismic areas

## Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00