



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Masonry Structures

### Course

Field of study

Civil Engineering

Area of study (specialization)

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Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

Other (e.g. online)

Tutorials

15

Projects/seminars

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr inż. Monika Siewczyńska

Responsible for the course/lecturer:

second person allowed

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Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 5 Poznań

### 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 carried out during the 7th and 15th lectures. Each of the colloquia consists of 5-10 questions (test or open), differently scored. The credit threshold: 50% of points. The lectures outlines on the basis of which the questions are developed will be sent to students via e-mail using the university's e-mail system.

In the case of e-learning, it is possible to change the method of passing the lectures in quizzes - after each lecture. The points obtained from the individual quizzes are added up and the final grade is determined on their basis.

Maximum number of points for each quiz: 3 points.

Number of quizzes: 7

Scoring - evaluation:

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 seminars are verified on the basis of the current verification of the correctness of calculations carried out in the exercise booklet (pass threshold - correctly performed calculations for the simplified method - grade 3.0, additionally for the detailed method - grade 4.0,



additionally for the "joined" method - evaluation 5.0) and presentation of the results obtained (possibility to increase the evaluation)

### Programme content

Lectures:

History of masonry structures

Types of masonry structures: walls, arches, vaults, column and beam structures

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

Masonry construction systems: cellular concrete, silicates, ceramics, clinker facades, reinforced brickwork

Building loads according to PN and EC: steady, imposed and snow loads

Building loads according to PN and EC: wind loads, load's combinations

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

Design of unreinforced masonry structures according to EC: simplified dimensioning methods, design of structures loaded with concentrated force. Structural requirements of masonry structures

Damage of masonry structures: principles of expertise, diagnostic methods

Repair methods of masonry structures: eliminating causes, changing the spatial stiffness of the building, reproducing the original technical condition, interfering with the static working pattern of the structure

Tutorials:

Verification of the resistance of the masonry pillar - calculations carried out (alone or in a team) in a notebook: Siewczyńska M., Workbook for design of Masonry Structures, Wydawnictwo ApuntoPress, Poznań, 2019

### Teaching methods

Lectures - informative lecture with multimedia presentation

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

### Bibliography

Basic

11. Drobiec Ł., Jasiński R., Piekarczyk A., Konstrukcje murowe według Eurokodu 6 i norm związanych, Tom 1, Wydawnictwo Naukowe PWN, Warszawa, 2013

2. Stawski B., Konstrukcje murowe. Naprawy i wzmocnienia, Wyd. Polcen, W-wa 2014



3. Siewczyńska M., Zeszyt ćwiczeń projektowych z konstrukcji murowych, Wydawnictwo ApuntoPress, Poznań, 2019

Additional

1. Jasiczak J., Gaczek M., Kuiński M., Siewczyńska M., Izolacyjność termiczna i nośność murowanych ścian zewnętrznych, Wyd. PP, P-ń 2011

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for classes, preparation for tests and project preparation) <sup>1</sup>	30	1,0

<sup>1</sup> delete or add other activities as appropriate