1. Course number and name

RB-S1-19-W16-15, Masonry & Timber Structures I

2. Credits and contact hours*

2 ECTS, lectures: 15 hours**, classes: 4 hours**, project: 10 hours**

3. Instructor's or course coordinator's name

Marta Kałuża, CEng, MSc, PhD, Assistant. Prof.

4. Text book, title, author, and year

- Hendry A.W., Sinha B.P., Davies S.R.: Design of Masonry Structures. E & FN SPON – an Imprint of Chapman & Hall. Taylor & Francis 2004.
- Borgstrom E.: Design of timber structures. Structural aspects of timber construction. Swedish Wood, 2016.

a. other supplemental materials

- Standards: EN-1996-1-1:2005, EN 1996-3: 2005, EN 1995-1-1: 2010.

5. Specific course information

a. brief description of the content of the course (catalog description)

Lectures:

MASONRY:

(1) Materials using in masonry structures, classification of masonry units, masonry under compression, modulus of elasticity and shear modulus, complex state of stress. (2) Limit States design, determination of all components of eccentricity, masonry structures mainly loaded vertically according to EN 1996-1-1. (3) Masonry subjected to bending, external not load-bearing walls, walls subjected to concentrated loads. (4) Simplified calculation methods given in EN 1996-3.

TIMBER:

(1)Timber as structural material, features, appearance, timber species, structure of timber, mechanical properties, failure modes. (2) The basic assumptions of the standard PN-EN-1995-1-1: 2010. (3) Calculation and dimensioning methods according to PN-EN-1995-1-1: 2010 including: Ultimate Limit State (ULS) and Serviceability Limit State (SLS). (4) Typical timber roof structures - construction and calculation.

Classes:

MASONRY & TIMBER:

Presentation and discussion of two project methodologies of the masonry building with timber floor and roof structures subjected to wind action and imposed loads.

Project:

MASONRY:

Verification of load-bearing capacity of unreinforced masonry column subjected to vertical compression in both orthogonal directions – detailed method (continuous model) and simplified method.

TIMBER:

Design of purlin roof elements (rafter, purlin and post)

b. prerequisites or co-requisites

The student must have completed the requirement for the following subjects:
Fundamentals of Structural Design, Mechanics of Materials.

c. indicate whether a required, elective, or selected elective (as per Table 5-1) course in the program

Required course.

6. Specific goals for the course

a. specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic

The aim of the subject is to get students to acquaint with the specificity of the designing and execution of timber and masonry structures elements, as well as structural materials and computational procedures according to standards (within ULS and SLS). Acquiring the skills of designing simple masonry and timber structures.

The student knows and understands:

- the principles of construction, dimensioning and structural analysis in the field of statics and stability of masonry and timber structures,
- the standards and guidelines for the design of selected general and industrial buildings of masonry and timber structures.

The student can:

- performs the load combination and the standard load combination for the construction works in accordance with the relevant design situtationa at the limit state,
- size selected structural elements and design simple timber and masonry structures.

b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

K1A_W05, K1A_W06, K1A_U02, K1A_U04

7. Brief list of topics to be covered

- presentation and characterisation of the main standards and guidelines for the design of selected general constructions made of masonry and timber;
- presentation and description of the principles of construction and sizing of building structures made of masonry and timber.

*- Consultations were not included in the contact hours

**-per semester