



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Building Construction_1

Course

Field of study

ARCHITECTURE

Area of study (specialization)

-

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

II/3

Profile of study

general academic

Course offered in

polish/english

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

30

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

dr hab. inż. arch. Jerzy Suchanek, prof. PP

e-mail: jerzy.suchanek@put.poznan.pl

tel. 61 665 33 12

Wydział Architektury ul. J. Rychlewskiego 2,

61-131 POZNAŃ

Tel. 61 665 32 60

Responsible for the course/lecturer:

dr inż. Robert Studziński

dr hab. inż. Katarzyna Rzeszut

Prerequisites

Student has explicit, theoretically based knowledge including the key issues of mathematics, the theory of structures, and strength of materials. Student has basic knowledge in the general building and executed project in the construction branch and professional responsibility of the designer.

Student can acquire information from publications, data bases and other sources, can interpret the said information and can integrate the acquired information. Student is able to conceptually design the structural layout for earlier developed mass of facility of industrial or general type.



Student understands the need for lifelong learning; can inspire and organize process of learning other people. Student is aware of the importance of non-technical aspects and effects of engineering activities. Student can work and can cooperate in a team, assuming a number of different roles therein.

Course objective

Presentation of the general issues related to the essence of the work and the use of steel, reinforced concrete and timber in building constructions. Presentation of basic assumptions to design the steel, reinforced concrete and timber constructions with the ability to use parameters contained in course publications. The ability to implementation of course knowledge for basic structural solution in various work cases of structural elements.

Course-related learning outcomes

Knowledge

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.W9. principles of occupational health and safety.

Skills

B.U3. use properly selected computer simulations, analyzes and information technologies, supporting architectural and urban design;

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

B.U5. make a preliminary economic analysis of planned engineering activities;

B.U6. properly apply standards and legal regulations in the field of architectural and urban design.

Social competences

-

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture - final colloquium during the end of semester.

Project - execution of the project and its oral defense.

Grading scale:

5.0 - the student obtained more than 90% of the points in the colloquium or defense of the project,

4.5 - the student obtained from 80% to 90% of the points in the colloquium or project defense,

4.0 - the student obtained from 70% to 80% of the points in the colloquium or project defense,

3.5 - the student obtained from 60% to 70% of the points in the colloquium or project defense,



3.0 - the student obtained from 50% to 60% of the points in the colloquium or project defense,

2.0 - the student obtained less than 50% of the points from the colloquium or project defense

Programme content

Lecture

Introduction to design of building structures. Process of design. Design philosophy. Introduction to Eurocodes.

Loads and actions according to Eurocode EN 1991 (climatic actions, useful loads, load category of buildings).

Safety, durability and robustness of building structures according to Eurocode EN 1990. Combination of actions. Limit state design concept: ultimate limit states, serviceability limit states.

Introduction to design of steel structures. Mechanical and physical properties of steel grades. Cross-section classification. Cross-section capacity. Preliminary design concept.

Introduction to design of timber structures. Mechanical and physical properties of solid timber and timber made products. Assortment of timber sections. Cross-section capacity. Preliminary design concept.

Introduction to design of reinforced concrete structures. Mechanical and physical properties of reinforced concrete. Classes of reinforced concrete. Components of reinforced concrete. Preliminary design concept.

Project

Definition of roof and floor layers. Determination of a dead weight loads.

Definition of variable loads: climatic actions, useful loads, service loads.

The transition from cubic to surface to linear loads for the various arrangement of the static scheme of structural elements.

Determination of the internal forces for different static schemes of beam elements (using the software). Preliminary design of a cross-section made of steel, timber and reinforced concrete.

Teaching methods

Lectures illustrated with slides and films - problem lecture / seminar lecture / lecture with multimedia presentation. Projects - preliminary design and definition of the loads and combinations for the given examples.

Bibliography



Basic

1. EN 1990: Eurocode - Basis of structural design
2. EN 1991-1-1: Eurocode 1: Actions on structures - Part 1-1 / Part 1-3 / Part 1-4
3. EN 1992-1-1: Eurocode 2: Design of concrete structures.
4. EN 1993-1-1: Eurocode 3: Design of steel structures.
5. EN 1995-1-1: Eurocode 5: Design of timber structures
6. Ioannis Vayas, John Ermopoulos, George Ioannidis, Design of Steel Structures to Eurocodes, doi. 10.1007/978-3-319-95474-5
7. Threlfall Tony, Worked Examples for the Design of Concrete Structures to Eurocode 2, Taylor & Francis, 2013, ISBN13 (EAN): 9780415468190
8. Porteous Jack, Structural Timber Design to Eurocode 5, Willey-Blackwell, 2013, ISBN13 (EAN): 9780470675007

Additional

1. Theodossopoulos Dimitris, Structural Design in Building Conservation, Taylor & Francis, 2012, ISBN13 (EAN): 9780415479462
2. Ching Francis D. K., Building Construction Illustrated, John Willey & Sons Inc, 2020, ISBN13 (EAN): 9781119583080
3. Edward Allen, Fundamentals of Building Construction: Materials and Methods 6th Edition, ISBN-13: 978-1118138915

Breakdown of average student's workload

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

¹ delete or add other activities as appropriate