



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design of structures [S2Bud1E-IPB>PK]

### Course

Field of study

Civil Engineering

Year/Semester

1/1

Area of study (specialization)

Construction Engineering and Management

Profile of study

general academic

Level of study

second-cycle

Course offered in

english

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

45

Laboratory classes

30

Other (e.g. online)

0

Tutorials

0

Projects/seminars

30

### Number of credit points

6,00

### Coordinators

dr hab. inż. Zdzisław Pawlak prof. PP  
zdzislaw.pawlak@put.poznan.pl

### Lecturers

Civan Yavaş  
civan.yavas@doctorate.put.poznan.pl

dr hab. inż. Zdzisław Pawlak prof. PP  
zdzislaw.pawlak@put.poznan.pl

dr hab. inż. Zbigniew Pozorski prof. PP  
zbigniew.pozorski@put.poznan.pl

### Prerequisites

Student knows the basic methods of mathematical analysis, has a basic knowledge of structural mechanics and strength of materials. Knows the basic materials used in building constructions.

### Course objective

To acquaint students with issues related to modeling of structures and related to the dimensioning of various types of structures based on European standards PN-EN.

### Course-related learning outcomes

Knowledge:

Student knows the principles of modeling and analysis of selected structural elements of buildings.  
Student knows the software and calculation procedures used in the design process.

Student knows the standards for the design of building objects and their elements.  
Student knows the basic provisions of building law regarding the design of structures.

**Skills:**

Student is able to use building standards regarding structural loads.  
Student can design the main building components using the principles of European PN-EN standards.  
Student is able to perform basic static and strength calculations of building structural elements.

**Social competences:**

Student is responsible for the reliability of the results obtained.  
Student is aware of the need for sustainable development of his personal competence.  
Student is aware of the importance of design work and its impact on the safety of people and property.

**Methods for verifying learning outcomes and assessment criteria**

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Written test in the last class. Passing requirement: 50% of points. Obligatory individual reports on completed design and laboratory tasks.

**Programme content**

Duties and requirements for civil engineers. The main principles and provisions of building law regarding design.

Performing static calculations of construction elements (climatic and service loads).

Rules for dimensioning structures made of wooden, steel and concrete elements according to European standards (ULS and SLS).

Designing building structural elements: beams, columns, plates, etc.

Dynamic analysis of selected building structures.

Determination of critical load coefficients and buckling length coefficients for simple bar systems.

**Teaching methods**

1. Lecture: multimedia presentation, illustrated with examples on the board.
2. Laboratory exercises: performing the tasks given by the teacher - practical exercises.
3. Design exercises: solution of design tasks given by the teacher - practical exercises.

**Bibliography**

**Basic**

1. S. Trahair, M.A. Bradford, D.A. Nethercot, L. Gardner (2007): The Behaviour and Design of Steel Structures to EC3, Balkema.
2. A.J. Bond et al. (2006), How to Design Concrete Structures using Eurocode 2. CCIP.
3. J. Sobon, R. Schroeder (1984), Timber frame construction: all about post and beam building. Garden Way Pub.

**Additional**

1. J.R. Underwood, M. Chiuini (1998), Structural Design: A Practical Guide for Architects. John Wiley & Sons.
2. Alan Williams (2011), Steel structures design. The McGraw-Hill.

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	150	6,00
Classes requiring direct contact with the teacher	105	4,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	1,50