



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Selected aspects of industrial structures designing [N2Bud1>WAPKP]

### Course

Field of study

Civil Engineering

Year/Semester

2/4

Area of study (specialization)

Structural Engineering

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

part-time

Requirements

elective

### Number of hours

Lecture

10

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

10

### Number of credit points

2,00

### Coordinators

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

### Lecturers

### Prerequisites

Knowledge, skills and competences acquired during the education process. The ability to formulate and solve technical problems in the field of civil engineering.

### Course objective

To acquaint students with the current problems of designing and implementing industrial facilities.

### Course-related learning outcomes

Knowledge:

1. The student has extended and detailed knowledge of material strength, modelling and constructing; have knowledge of theoretical principles of the finite element method as well as general rules of non-linear calculations of engineering structures. (KB\_W04)
2. The student knows in detail the rules of design, construction and operation of selected building units. (KB\_W07)

Skills:

1. The student is able to correctly define a computational model and carry out an advanced linear

analysis of complex building units, their elements and connections; is able to apply basic nonlinear computational techniques together with a critical evaluation of numerical analysis results. (KB\_U05)  
2. The student is able to dimension complex construction details of selected elements of building structures. (KB\_U07)

Social competences:

1. The student is ready to autonomously complete and broaden (extend) knowledge in the field of modern processes and technologies of building engineering. (KB\_K03)
2. The student can realise that it is necessary to improve professional and personal competence; is ready to critically evaluate the knowledge and received content. (KB\_K05)

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Passing the lectures on the basis of a positive grade (minimum 3.0) of the final written test. The condition for passing the design exercises is correct and timely execution of the design task and positive defense of the design.

### Programme content

Design principles of large-scale hall structures.

Modeling of basic structural elements.

Supporting structures for machinery, tanks, installations, suspended transport.

### Course topics

Lectures

1. Principles of designing large-area halls - part 1
2. Principles of designing large-area halls - part 2
3. Modeling of basic construction elements
4. Modeling of reinforced concrete structures: beams, columns, frames, slabs, foundations
5. Support structures for machines, tanks, installations, suspended transport.

Final test

Projects

1. Introductory information, program configuration, determining the geometry of the structure, modeling of a frame.
2. Dimensioning of frame elements: girder, columns, foundations
3. Gable wall: cap beam, gable column, static diagrams, dimensioning
4. Multi-span lattice girder: loads, buckling lengths, two-way bent columns
5. Defense and project evaluation

### Teaching methods

Lectures: informative, problem lecture, case study method

Projects: project method

### Bibliography

Basic

1. PN-EN 1990:2004 Eurokod - Podstawy projektowania konstrukcji, PKN, Warszawa 2014.
2. PN-EN 1991-1-3 Eurokod 1 - Oddziaływania na konstrukcje. Część 1-3 Oddziaływania ogólne. Obciążenie śniegiem, PKN, Warszawa 2005.
3. PN-EN 1991-1-4 Eurokod 1 - Oddziaływania na konstrukcje. Część 1-4 Oddziaływania ogólne. Oddziaływania wiatru, PKN, Warszawa 2008.
4. PN-EN 1992-1-1 Eurokod 2 -- Projektowanie konstrukcji z betonu. Część 1-1 Reguły ogólne i reguły dla budynków, PKN, Warszawa 2008.
5. PN-EN 1993-1-1 Eurokod 3 -- Projektowanie konstrukcji stalowych. Część 1-1 Reguły ogólne i reguły dla budynków, PKN, Warszawa 2014.
6. Kurzawa Z., Chybiński M., Projektowanie konstrukcji stalowych, Wydawnictwo PP, Poznań 2008.
7. Kozłowski + zespół, Konstrukcje stalowe. Przykłady obliczeń wg PN-EN 1993-1 cz.1, cz.2., Rzeszów

2012.

8. Giżejowski M., Ziółko J., Budownictwo ogólne tom 5, Arkady, Warszawa 2010.

Additional

1. [inzynierbudownictwa.pl/konstrukcje-stalowe-hal-wielkopowierzchniowych/](http://inzynierbudownictwa.pl/konstrukcje-stalowe-hal-wielkopowierzchniowych/)

2. [www.wolstal.com/projektowanie-hal-wielkopowierzchniowych/](http://www.wolstal.com/projektowanie-hal-wielkopowierzchniowych/)

3. [traskostal.pl/pl/obudowy,135](http://traskostal.pl/pl/obudowy,135)

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	20	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00