

# Course description

<b>Course abbreviation:</b>	KME/POS2	<b>Page:</b>	1 / 4
<b>Course name:</b>	Build. Struct. 2 - Load-bearing Struct.		
<b>Academic Year:</b>	2023/2024	<b>Printed:</b>	01.06.2024 10:29

<b>Department/Unit /</b>	KME / POS2			<b>Academic Year</b>	2023/2024
<b>Title</b>	Build. Struct. 2 - Load-bearing Struct.			<b>Type of completion</b>	Exam
<b>Long Title</b>	Building Structures 2 - Load-bearing Structures of Buildings				
<b>Accredited/Credits</b>	Yes, 4 Cred.			<b>Type of completion</b>	Combined
<b>Number of hours</b>	Lecture 2 [Hours/Week] Tutorial 2 [Hours/Week]				
<b>Occ/max</b>	Status A	Status B	Status C	<b>Course credit prior to</b>	YES
<b>Summer semester</b>	0 / -	0 / -	0 / -	<b>Counted into average</b>	YES
<b>Winter semester</b>	20 / -	0 / -	0 / -	<b>Min. (B+C) students</b>	1
<b>Timetable</b>	Yes			<b>Repeated registration</b>	NO
<b>Language of instruction</b>	Czech			<b>Semester taught</b>	Winter semester
<b>Optional course</b>	Yes			<b>Internship duration</b>	0
<b>Evaluation scale</b>	1 2 3 4			<b>Ev. sc. – cred.</b>	S N
<b>No. of hours of on-premise</b>					
<b>Auto acc. of credit</b>	No				
<b>Periodicity</b>	K				
<b>Substituted course</b>	None				
<b>Preclusive courses</b>	N/A				
<b>Prerequisite courses</b>	N/A				
<b>Informally recommended courses</b>	N/A				
<b>Courses depending on this Course</b>	N/A				

## Course objectives:

Student will be acquainted with the effects of complex influences on building structures and their interactions, and with application of this knowledge in the design of foundations, substructure including its waterproofing systems, overhanging structures, vertical communications and load-bearing structures of roofs.

## Requirements on student

Požadavky k zápočtu:

Student will create semestral tasks in a satisfactory quality and pass written tests with a success rate of over 50%.

Požadavky ke zkoušce:

Student will demonstrate adequate knowledge of semestral subject and skills of its application in context.

## Content

1. Structural systems of buildings - summary and repetition; external effects and response of structural system; basic information about expansion joints - types and their properties.
2. Dilatation in buildings - principles of interaction between the primarily bearing and non-bearing structures, load by deformation effects, preventing their transmission, the consequences of their underestimation.
3. Internal staircases - functions and requirements, typology, shape solutions, structural principles, acoustics, fire safety.
4. Internal staircases - structural, material and technological options.
5. Internal staircases - static principles, interaction with the load-bearing system of the building.
6. Sloping ramps, elevator shafts and escalators - structural principles, interaction with the load-bearing system, static requirements for the supporting structures; exterior and outdoor staircases - structural, material and technological options,

requirements and properties.

7. Overhanging structures I. - types, functions and requirements, external influences.

8. Overhanging structures II. - structural solutions, static behaviour. Anchoring and fastening technology - mechanical fasteners, shear pins, chemical anchors, adhesives -the principles of design and use, properties, transfer of load.

9. Foundation structures I. - hydro-geological survey, foundation conditions, geotechnical categories; foundations - functions and requirements, structural principles, impact on the static behavior of the structural system; interaction of the system -building - foundations - subsoil.

10. Foundation structures II. - shallow foundations - types, structural and material solutions, static behaviour; deep foundations - types, structural and material solutions, static behaviour.

11. Substructure - soil pressure, hydrostatic pressure, loads affecting the substructure, basement walls, lighting and ventilation shafts - requirements and properties, principles, structural and technological solutions.

12. Waterproofing of substructure I. - hydrophysical exposure of substructure, aggressiveness environment, waterproofing coating systems - types, properties, design principles.

13. Waterproofing of substructure II. - other waterproofing systems - types, properties, design principles, special details; dilation of waterproofing systems and substructures.

## Fields of study

### Guarantors and lecturers

- **Guarantors:** Doc. Ing. Jan Pašek, Ph.D. (100%)
- **Lecturer:** Doc. Ing. Jan Pašek, Ph.D. (100%)
- **Tutorial lecturer:** Doc. Ing. Jan Pašek, Ph.D. (100%)

### Literature

- **Basic:** ČSN 01 3420 (013420) Výkresy pozemních staveb. Kreslení výkresů stavební části.
- **Basic:** Syllabus pro předmět POS2 (Pašek J.)
- **Recommended:** Barritt C. M. H. *Advanced Building Construction, Vols. 1 ? 4, Longman, 1988 ? 1991 (angl.)*.
- **Recommended:** Hájek P. a kol. *Konstrukce pozemních staveb 1 ? nosné konstrukce I*. ČVUT Praha, 2006.
- **Recommended:** Witzany J. a kol. *Konstrukce pozemních staveb 20*. ČVUT Praha, 2006.
- **Recommended:** Barry R. *The Construction of Building, Vols. 1 ? 4, Oxford BSP, 1991 ? 2000 (anglicky)*.
- **Recommended:** Schueller W. *The Design of Building Structures, rev. ed., 2016, Vol. 2*. Computers & Structures, Inc., 2016.

### Time requirements

#### All forms of study

Activities	Time requirements for activity [h]
Preparation for an examination (30-60)	30
Contact hours	52
Undergraduate study programme term essay (20-40)	32
<b>Total:</b>	<b>114</b>

### assessment methods

**Knowledge - knowledge achieved by taking this course are verified by the following means:**

Combined exam  
Seminar work  
Test

**Skills - skills achieved by taking this course are verified by the following means:**

Combined exam  
Seminar work

**Competences - competence achieved by taking this course are verified by the following means:**

Combined exam  
Seminar work

**prerequisite****Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:**

be familiar with the specific requirements of buildings  
to describe structural systems of buildings, requirements for them and principles of their design  
to explain the properties of vertical load-bearing structures, their requirements and the principles of their design  
to explain the properties of horizontal load-bearing structures, their requirements and the principles of their design  
be familiar with the issue of expansion joints of building structures and expansion joints

**Skills - students are expected to possess the following skills before the course commences to finish it successfully:**

to create an overview of the effects on the structures of the buildings  
to design the structural system of the building  
to design the location of the elements of the vertical load-bearing structures of the building  
to design the concept of horizontal load-bearing structures of the building  
to design the location and type of expansion joint

**Competences - students are expected to possess the following competences before the course commences to finish it successfully:**

N/A  
N/A  
N/A  
N/A  
N/A

**teaching methods****Knowledge - the following training methods are used to achieve the required knowledge:**

Lecture  
Practicum  
Group discussion  
Self-study of literature  
Discussion

**Skills - the following training methods are used to achieve the required skills:**

Lecture  
Practicum  
Group discussion  
Self-study of literature  
Discussion

**Competences - the following training methods are used to achieve the required competences:**

Lecture

Practicum  
Group discussion  
Self-study of literature  
Discussion

### learning outcomes

#### Knowledge - knowledge resulting from the course:

to be oriented in complex requirements for building constructions  
to explain the properties of overhang structures, their requirements and the principles of their design  
to explain the properties of staircases, their requirements and the principles of their design  
to explain the properties of the supporting structures of the roofs, the requirements for them and the principles of their design  
to explain the properties of foundation structures, requirements for them and the principles of their design  
to explain the properties of the basement structures, requirements for them and the principles of their design, including the waterproofing system

#### Skills - skills resulting from the course:

to analyze the effects affecting the building structures  
to design and optimize structural system of the building  
to design overhang structures of the building  
to design staircase  
to design the supporting structure of the roof  
to design the system of the shallow foundations of the building  
to design the basement structure, including the waterproofing system

#### Competences - competences resulting from the course:

N/A

N/A

N/A

### Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Stavební inženýrství - Bachelor Pozemní stavby		Full-time	Stavební inženýrství - Pozemní stavby	1	2023	2023	Povinné předměty	A	2	ZS
Stavební inženýrství - Bachelor Pozemní stavby		Full-time	Stavební inženýrství - Pozemní stavby	1	2021 akr	2023	Povinné předměty	A	2	ZS