

## COURSE SYLLABUS AND COURSE REQUIREMENTS

### ACADEMIC YEAR 2024/2025 SEMESTER SPRING

<i>Course title</i>	CONSTRUCTION MATERIALS 1
<i>Course Code</i>	MSE016ANEP
<i>Hours/Week: le/pr/lab</i>	2 lectures, 2lab /week
<i>Credits</i>	3
<i>Degree Programme</i>	Civil Engineering (B.Sc)
<i>Study Mode (TVSZ-ben training schedule)</i>	
<i>Requirements</i>	Exam
<i>Teaching Period</i>	2nd
<i>Prerequisites</i>	None
<i>Department(s)</i>	Civil Engineering
<i>Course Director</i>	
<i>Teaching Staff</i>	Ali Mohamed Mohamed Salem
<i>Hours/Week: le/pr/lab</i>	2 lectures, 2 lab /week

## COURSE DESCRIPTION

*Neptun: Instruction/Subjects/Subject Details/Basic data/Subject description*

This course provides an introductory overview of the various materials used in the construction industry. After an introduction into the history of building materials, fundamental principles of structural, physical and long-term performance of materials are presented. Students will learn about material and product manufacturing techniques and how they relate to the mechanical and non-mechanical properties of the various materials. Special emphasis is given in the course to concrete mix design and concrete technology.

Students also have the opportunity to experience material capacity and behaviour as well as construction methods in demonstrations and laboratory experiments. Furthermore, material applications and detailing in structural and non-structural building components are explored. Resulting of this course, students will gain a comparative knowledge of material properties and possible applications in construction and architecture.

## SYLLABUS

*Neptun: Instruction/Subjects/Subject Details/Syllabus*

### 1. GOALS AND OBJECTIVES

*Neptun: Instruction/Subjects/Subject Details/Syllabus/Goal of Instruction*

Students will gain from this course:

- Comparative knowledge of material properties for most common and advanced building materials,
- Practical knowledge of concrete mix design,
- Understanding of typical and potential applications of construction materials,
- Ability to identify crucial problem areas in the manufacture and applications of building materials,
- Understanding of importance of experimental verification of material properties.

Furthermore, upon completion of this course, the student will be able to:

- Conduct civil engineering experiments in a team setting,
- Analyse and interpret the resulting data of the experiments.
- Create a complete formal laboratory report describing the particular experiment, summarizing the results and analysing the implications of the test.

### 2. COURSE CONTENT

*Neptun: Instruction/Subjects/Subject Details/Syllabus/Subject content*

## TOPICS

LECTURE	TOPICS
	1. Introduction to construction materials.
	2. History of construction materials I.: From prehistoric construction to modern architecture.

## PRACTICE

3. History of construction materials II.: Concrete.
4. Basics of concrete technology I.
5. Constituent materials of concrete. Manufacturing of concrete products.
6. Basics of concrete technology II.
7. Fresh concrete properties.
8. Tests on fresh concrete.
9. Concrete Mix Design.
10. Special concretes.
11. Metals. Steel reinforcement
12. Timber structures
13. Masonry structures. Fibre composites.
14. Mechanical properties of engineering materials.

1. Introduction to Properties and Testing of Materials. Physical Properties (Properties associated with mass distribution -Hydro technical properties)
2. Cement, mortar and gypsum test. Concrete aggregates.
3. Sieve analysis of aggregate
4. Sieve analysis of aggregate
5. Laboratory tests on cement, lime and mortar.
6. Design of normal concrete mixes.
7. Laboratory tests on concrete
8. Laboratory tests on concrete (compression + flexural)
9. Laboratory tests on concrete (Compression + flexural)
10. Concrete Admixture + design of special types of concrete
11. Laboratory tests on steel.
12. Laboratory tests Brick and timber. Summary

## DETAILED SYLLABUS AND COURSE SCHEDULE

ACADEMIC HOLIDAYS INCLUDED

### LECTURE

week	Topic	Compulsory reading; page number (from ... to ...)	Required tasks (assignments, tests, etc.)	Completion date, due date
1.	Course description. Orientation. Introduction to construction materials.	...	...	...
2.	History of construction materials I.: From prehistoric construction to modern architecture.	Lecture notes and slides		
3.	History of construction materials II.: Concrete.	Lecture notes and slides		
4.	Basics of concrete technology I. Constituent materials of concrete. Manufacturing of concrete products.	Lecture notes and slides	Assignment _1	06-03-2025
5.	Basics of concrete technology II. Fresh concrete properties.	Lecture notes and slides	Assignment _2	13-03-2025
6.	Concrete Mix Design	Lecture notes and slides	Assignment _3	20-03-2025
7.	Special concretes.	Lecture notes and slides		
8.	<b>Midterm exam</b>	Lecture notes and slides		
9.	Metals. Steel reinforcement	Lecture notes and slides	Assignment _4	10-04-2025
10.	Timber structures	Lecture notes and slides		
11.	Masonry structures. Fibre composites.	Lecture notes and slides		

12.	Spring Break		
13.	Mechanical properties of engineering materials.	Lecture notes and slides	
14.	Final exam.		

### **PRACTICE, LABORATORY PRACTICE**

<i>week</i>	<b>Topic</b>	<b>Compulsory reading; page number (from ... to ...)</b>	<b>Required tasks (assignments, tests, etc.)</b>	<b>Completion date, due date</b>
1.	Introduction to Properties and Testing of Materials. Physical Properties (Properties associated with mass distribution -Hydro technical properties)	...	...	...
2.	Cement, mortar and gypsum test. Concrete aggregates.	Lecture notes and slides		
3.	Sieve analysis of aggregate	Lecture notes and slides		
4.	Sieve analysis of aggregate	Lecture notes and slides	Assignment_1	06-03-2025
5.	Laboratory tests on cement, lime and mortar.	Lecture notes and slides		
6.	Design of normal concrete mixes.	Lecture notes and slides	Assignment_2	13-03-2025
7.	Laboratory tests on concrete	Lecture notes and slides	Assignment_3	20-03-2025
8.	Laboratory tests on concrete (compression + flexural)	Lecture notes and slides		
9.	<b>Laboratory tests on concrete (Compression + flexural)</b>	Lecture notes and slides		
10.	Concrete Admixture + design of special types of concrete	Lecture notes and slides		
11.	Laboratory tests on steel.	Lecture notes and slides	Assignment_4	10-04-2025
12.	Spring break			
13.	Laboratory tests Brick and timber. Summary	Lecture notes and slides	Assignment_11	
14.	Final exam.			

### **3. ASSESSMENT AND EVALUATION**

*(Neptun: Instruction/Subjects/Subject Details/Syllabus/Examination and Evaluation System)*

#### **ATTENDANCE**

*In accordance with the Code of Studies and Examinations of the University of Pécs, Article 45 (2) and Annex 9. (Article 3) a student may be refused a grade or qualification in the given full-time course if the number of class absences exceeds 30% of the contact hours stipulated in the course description.*

**Method for monitoring attendance** (e.g.: attendance sheet / online test/ register, etc.)

attendance sheet

#### **ASSESSMENT**

*Cells of the appropriate type of requirement is to be filled out (course-units resulting in mid-term grade or examination). Cells of the other type can be deleted.*

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**Course resulting in mid-term grade (PTE TVSz 40§(3))**

**Mid-term assessments, performance evaluation and their ratio in the final grade**

Type	Assessment	Ratio in the final grade
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Attendance	10 points	10%
Assignments	20 points	20%
Midterm Exam	20 points	20%
Final Exam	50 points	50%

**Opportunity and procedure for re-takes** (PTE TVSz 47§(4))

all tests and assessment tasks can be repeated/improved at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.

**Grade calculation as a percentage**

based on the aggregate performance according to the following table

Course grade	Performance in %
excellent (5)	85 % ...
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

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**Course-unit with final examination**

**Mid-term assessments, performance evaluation and their weighting as a pre-requisite for taking the final exam**

Type	Assessment	Weighting as a proportion of the pre-requisite for taking the exam
1. Attendance	10 points	10%
2. Assignments	20 points	20%
3. Midterm Exam	20 points	20%
4. Final Exam	50 points	50%

**Requirements for the end-of-semester signature**

The end-of-semester signature is successful if the result is minimum **40** %.

**Re-takes for the end-of-semester signature** (PTE TVSz 50§(2))

All tests and assessment tasks can be repeated/improved at least once every semester, and the tests and home assignments can be repeated/improved at least once in the first two weeks of the examination period.

**Type of examination** (written, oral): written

The exam is successful if the result is minimum **40** %.

**Calculation of the grade** (TVSz 47§ (3))

The mid-term performance accounts for **20** %, the performance at the exam accounts for **50** % in the calculation of the final grade.

**Calculation of the final grade based on aggregate performance in percentage.**

Course grade	Performance in %
excellent (5)	85 % ...
good (4)	70 % ... 85 %
satisfactory (3)	55 % ... 70 %
pass (2)	40 % ... 55 %
fail (1)	below 40 %

The lower limit given at each grade belongs to that grade.

## **4. SPECIFIED LITERATURE**

*In order of relevance. (In Neptun ES: Instruction/Subject/Subject details/Syllabus/Literature)*

### **COMPULSORY READING AND AVAILABILITY**

- [1.] Primary compulsory reading and its availability
- [2.] Compulsory literature and its availability

### **RECOMMENDED LITERATURE AND AVAILABILITY**

- [3.] Peter Domone, John Illston: "Construction Materials: Their Nature and Behaviour", Fourth Edition, 2010 by CRC Press, ISBN 9780415465151.
- [4.] - Lecture notes and slides