***Annex 1***

*Recommended template: “Course Description, Syllabus, Course Requirements”*

# course syllabus and course requirements academic year 2022/2023 semester Fall

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| Course title | CONSTRUCTION MATERIALS 1 |
| **Course Code** | MSE081AN-EA-00 |
| **Hours/Week: le/pr/lab** | **2 lectures, 2 practice, 2lab /week** |
| **Credits** | **3** |
| **Degree Programme** | **B.Sc in Architecture Engineering** |
| **Study Mode (TVSZ-ben training schedule)** |  |
| **Requirements** | **None** |
| **Teaching Period** | **1st** |
| **Prerequisites** | **None** |
| **Department(s)**  **Course Director** | **Architecture Engineering** |
| **Teaching Staff** | **Ali Mohamed Mohamed Salem** |
| **Hours/Week: le/pr/lab** | **2 lectures, 2 practice, 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*

## **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.

## **course content**

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

|  |  |
| --- | --- |
|  | TOPICS |
| LECTURE | 1. Introduction to construction materials. 2. History of construction materials I.: From prehistoric construction to modern architecture. 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. |
| PRACTICE | 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 | Assignment \_1 | 27-09-2022 |
| 4. | Basics of concrete technology I.  Constituent materials of concrete. Manufacturing of concrete products. | Lecture notes and slides | Assignment \_2 | 04-10-2022 |
| 5. | Basics of concrete technology II.  Fresh concrete properties. | Lecture notes and slides | Assignment \_3 | 11-10-2022 |
| 6. | Tests on fresh concrete. | Lecture notes and slides | Assignment \_4 | 18-10-2022 |
| 7. | Concrete Mix Design. | Lecture notes and slides | Assignment \_5 | 25-10-2022 |
| 8. | Special concretes. | Lecture notes and slides | Assignment \_6 | 08-11-2022 |
| 9. | **Autumn break** | ----- | ----- | ----- |
| 10. | **Midterm exam** | ------ | ------ | ------ |
| 11. | Metals. Steel reinforcement | Lecture notes and slides | Assignment \_7 | 21-11-2022 |
| 12. | Timber structures | Lecture notes and slides | Assignment \_8 | 28-11-2022 |
| 13. | Masonry structures. Fibre composites. | Lecture notes and slides | Assignment \_9 | 05-12-2022 |
| 14. | Mechanical properties of engineering materials. | Lecture notes and slides | Assignment \_10 | 12-12-2022 |
| 15. | Final exam. |  |  |  |

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| --- | --- | --- | --- | --- |
| PRACTICE, LABORATORY PRACTICE | | | | |
| week | **Topic** | **Compulsory reading; page number**  **(from … to …)** | **Required tasks (assignments, tests, etc.)** | **Completion date, due date** |
| 1. | No class. | … | … | … |
| 2. | Introduction to Properties and Testing of Materials. Physical Properties (Properties associated with mass distribution -Hydro technical properties) | Lecture notes and slides | ---- |  |
| 3. | Cement, mortar and gypsum test. Concrete aggregates. | Lecture notes and slides | Assignment \_1 | 27-09-2022 |
| 4. | Sieve analysis of aggregate | Lecture notes and slides | Assignment \_2 | 04-10-2022 |
| 5. | Sieve analysis of aggregate | Lecture notes and slides | Assignment \_3 | 11-10-2022 |
| 6. | Laboratory tests on cement, lime and mortar. | Lecture notes and slides | Assignment \_4 | 18-10-2022 |
| 7. | Design of normal concrete mixes. | Lecture notes and slides | Assignment \_5 | 25-10-2022 |
| 8. | Laboratory tests on concrete | Lecture notes and slides | Assignment \_6 | 08-11-2022 |
| 9. | **Autumn break** | ----- | ----- | ----- |
| 10. | Laboratory tests on concrete (compression + flexural) | Lecture notes and slides | Assignment \_7 | 14-11-2022 |
| 11. | **Laboratory tests on concrete (Compression + flexural)** | Lecture notes and slides | Assignment \_8 | 21-11-2022 |
| 12. | Concrete Admixture + design of special types of concrete | Lecture notes and slides | Assignment \_9 | 28-11-2022 |
| 13. | Laboratory tests on steel. | Lecture notes and slides | Assignment \_10 | 05-12-2022 |
| 14. | Laboratory tests Brick and timber. Summary | Lecture notes and slides | Assignment \_11 | 12-12-2022 |
| 15. | Final exam. |  |  |  |

## **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.*

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** |
| Attendance | 10 points | 10% |
| Assignments | 20 points | 20% |
| Midterm Exam | 30 points | 30% |
| Final Exam | 40 points | 40% |

**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.

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% |
| 1. Assignments | 20 points | 20% |
| 1. Midterm Exam | 30 points | 30% |
| 1. Final Exam | 40 points | 40% |

**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  ***30***  %, the performance at the exam accounts for  ***40***  % 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.

## **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