

I. Subject Specification

1. Basic Data

1.1 Title

Construction Materials II.

1.2 Code

BMEEOEMAS41

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	1
Lab	2

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Balázs L. György
academic rank	Professor
email	balazs.gyorgy@emk.bme.hu

1.8 Department

Department of Construction Materials and Technologies

1.9 Website

<https://epito.bme.hu/BMEEOEMAS41>

<https://fiek2.mywire.org/course/view.php?id=426>

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Specialization in Structural Engineering (BSc) programme

1.12 Prerequisites

Weak prerequisites:

- Construction Materials I. (BMEEOEMAT43)

1.13 Effective date

1 September 2017

2. Objectives and learning outcomes

2.1 Objectives

Students become familiar with the mechanical and physical properties of construction materials. Aspects and requirements of the selection of construction materials. Application fields of construction materials. Influencing factors to the strength of concrete. Influencing factors to the freeze-thaw resistance and water tightness of concrete. Fibre reinforced concrete. Lightweight concrete. Metals. Aluminium and aluminium alloys. Production of iron and steel. Phase behaviour of iron-carbon alloys. Morphology of metals. Martensite. Heat treatments for steel. Materials for road constructions. Bitumen and asphalt: definitions and properties. Concrete corrosion: definitions and properties. Protection against concrete corrosion. Polymers. Paints and surface layers. Pavement markings. Thermal and acoustic insulations.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Knows the properties of special construction materials
2. Knows the apply technologies of construction materials
3. Knows the construction materials and their basic performance used in building and road constructions
4. Is able to choose and compare the construction materials for different structural elements.

B. Skills

1. Is able to judge and interpret the proper structural material significations,
2. Is able to judge and compare the basic material properties,
3. Is able to choose the proper construction material for the structure,
4. Is able to speak and write with appropriate technical terms about each topic of the subject.
5. Is able to apply the theoretical phenomenon during exact technical tasks.

C. Attitudes

1. Cooperates with the teacher,
2. Participates in life-long learning (communication, knowledge, technical terms),
3. Open to use up to date information technology,
4. During homework intends to apply different types of gaining knowledge (notes, laboratory protocols, catalogues, online references).

D. Autonomy and Responsibility

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1. Is able to work alone on homework,
2. Is open to receive critic and develop,
3. Is able to participate in problem-solving as part of a group,
4. Participate in professional debates,
5. Can account for his/her opinion.

2.3 Methods

Lectures with the active participation of students.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Aspects and requirements of the selection of construction materials. Application fields of construction materials, metal corrosion, hardness and impact strength
2.	Surface protection
3.	Influencing factors to the strength of concrete. Influencing factors to the freeze-thaw resistance and water tightness of concrete. Fibre reinforced concrete. Lightweight concrete. NDT tests on building site.
4.	Building diagnostics
5.	Metals. Aluminium and aluminium alloys. Production of iron and steel. Phase behaviour of iron-carbon alloys. Morphology of metals. Martenzit. Heat treatments for steel. Mortars
6.	Testing od deformations
7.	Materials for road constructions. Bitumen and asphalt: definitions and properties. Wall, slab and roofing elements.
8.	Organic binders, consistency.
9.	Concrete corrosion: definitions and properties. Protection again concrete corrosion. Special concretes.
10.	Concrete pavements and roads.
11.	Polymers. Paints and surface layers. Pavement markings. Pavement markings. Thermal and acoustic insulations.
12.	Glass properties
13.	Summarization
14.	Summarization

The above programme is tentative and subject to changes due to calendar variations and other reasons specific to the actual semester. Consult the effective detailed course schedule of the course on the subject website.

2.5 Study materials

Printed lecture notes

- a) Everett, Alan: Materials. Mitchel's building series. ISBN 0-7134-5442-3
- b) Mindess, Sidney: Concrete. Civil engineering and Engineering Mechanics series. ISBN 0-13-167106-5

2.6 Other information

2.7 Consultation

The instructors are available for consultation during their office hours, as advertised on the department website. Special appointments can be requested via e-mail: balazs.gyorgy@epito.bme.hu

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This Subject Datasheet is valid for:

2023/2024 semester I

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The assessment of the learning outcomes specified in clause 2.2. above and the evaluation of student performance occurs via tests, homework assignments and class work.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. midterm test	T1	A.1-A.4; B.1-B.5; C.3
1. homework	HW1	A.1-A.4; B.4-B.5; C.1-C.4; D.1-D.5
Written and oral examination	E	A.1-A.4; B.1-B.5; C.3; D.4-D.5

The dates of midterm tests and deadlines of assignments/homework can be found in the detailed course schedule on the subject's website.

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3.3 Evaluation system

Abbreviation	Score
T1	30%
HW1	10%
Total achievable during the semester	40%
E	60 %
Sum	100%

3.4 Requirements and validity of signature

Signature can be obtained by getting min. 50% of the available points on midsemester results (T1, HW1) and perform the required presence on contact hours.

3.5 Grading system

Grade	Points (P)
excellent (5)	85 % \leq T
good (4)	74 % \leq T < 85%
satisfactory (3)	63 % \leq T < 74%
passed (2)	50 % \leq T < 63%
failed (1)	50% < T

3.6 Retake and repeat

1) Second repetition of midterm test (T1) is subjected to a fee.

2) The Homework can be submitted with fee until 16:00 o'clock of the end of the repetition period or until 23:59 electronically on the same day.

3.7 Estimated workload

Activity	Hours/semester

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contact hours	$14 \times 3 = 42$
preparation for the laboratory courses	$14 \times 0,5 = 7$
homework	10
preparation for the midterm test	11
preparation for the examination	20
Sum	90

3.8 Effective date

1 September 2017

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