Rheological and temperature dependent material properties - BMEEOEMDT85

I. Subject Specification

1. Basic Data

1.1 Title

Rheological and temperature dependent material properties

1.2 Code

BMEEOEMDT85

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	2

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Majorosné Dr. Lublóy Éva Eszter
academic rank	Associate professor
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1.8 Department

Department of Construction Materials and Technologies

1.9 Website

https://epito.bme.hu/BMEEOEMDT85
https://fiek2.mywire.org/course/view.php?id=2518

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 September 2022

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2. Objectives and learning outcomes

2.1 Objectives

During the course, students become acquaineted with the behavior of each material at high and low temperetures. Within the framwork of the course, we als cover rheology with time-dependent properties such as creep, shrinkage and relexation, we also deal with the reological propertise of self-compacting concretes.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. knows the behavior of buildings materials at high and low temeperatures
2. know the effect of tempereture on changes in the properties of materials
3. know the reollogical properties of materials (relaxation, creep, shrinkage)
4. know the measurment methodes for self-compacting concretes, tehier principles and reological aspects

B. Skills

1. is able to recognize and identify the hazards of building materials under fire or low temperatures,
2. apply the selection of different measurement and evaluation methods efficiently and reasonably,
3. knows the types of deformation of building materials over time, can count on them and knows their effect on the structure.
4. is able to apply his / her knowledge in solving specific tasks.

C. Attitudes

1. eeks to learn about the structures taught in principle on the ground and
2. to apply the practice of field research,
3. trives for accurate and error-free problem identification and assessment

D. Autonomy and Responsibility

1. independently assesses problems,
2. openly accepts substantiated critical remarks,
3. takes a systemic approach to its thinking.

2.3 Methods

Lectures, communication in writing and orally. Case study processing.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1	Introduction, concepts overview
2	Basic rheological models
3	Creep
4	Shrinkage
5	Relaxation
6	Rheometer
7	Classification of building materials according to the standard and the possibilities of their classification. Test methods used for qualification
8	Behavior of concrete at high temperatures (strength characteristics, porosity, deformation). Effect of chemical and physical processes at high temperatures in concrete on mechanical properties.
9	Behavior of steel at high temperatures. Possibilities of fire protection of steel structures.
10	Behavior of wood at high temperatures.
11	Behavior of plastics at high temperatures. Possibilities and limitations of using plastics.
12	Behavior of reinforced concrete structures at high temperatures.
13	-
14	Accountability

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

1. Balázs L. Gy., Lublóy É. (2009), "Magas hőmérséklet hatása a vasbeton szerkezetek anyagaira" VASBETONÉPÍTÉS 2009/2, pp. 48-54, www.fib.bme.hu/vb2009_2_cikk/Vb2009_2.pdf
2. fib bulletin 38, (2007), "Fire design of concrete structures - materials, structures and modelling", Lausanne, ISBN: 978-2-88394-078-9
3. fib bulletin 46, (2008), "Fire design of concrete structures - materials, structural behaviour and assessment", Lausanne, ISBN: 978-2-88394-086-4.

2.6 Other information

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2.7 Consultation

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This Subject Datasheet is valid for:

Inactive courses

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

A 2.2. The assessment of the learning outcomes set out in point 1 is based on a summary dissertation and a study plan.

3.2 Assessment methods

Evaluation form	Jele	Assessed learning outcomes
test	T	A.1-A.4; B.1-B.4
homework	H	B.1-B.4; C.1-C.3; D.1-D.3

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

3.3 Evaluation system

Abbreviation	Score
test	60%
hmework	40%
Sum	**100%**

3.4 Requirements and validity of signature

no signature can be obtrained

3.5 Grading system

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

3.6 Retake and repeat

For the first time during the diligence period, the locker can be replaced or repaired free of charge. In case of correction, the more favorable of the previous and the new result for the student is taken into account.
If the student is not able to obtain a grade other than insufficient with the replacement according to point 1, he / she - in addition to paying the fee specified in the regulations - will make a second attempt to correct the unsuccessful first replacement.

3.7 Estimated workload

Activity	Hours/semester
contact hours	14×2=28
home studying of the written materia	14×0,5=7

home studying for exam	25
Sum	**60**

3.8 Effective date

1 September 2022

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