Reinforced Concrete Buildings - BMEEOHSA-A2

I. Subject Specification

1. Basic Data

1.1 Title

Reinforced Concrete Buildings

1.2 Code

BMEEOHSA-A2

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Lecture	3
Seminar	1

1.5 Evaluation

Exam

1.6 Credits

5

1.7 Coordinator

name	Dr. István Haris
academic rank	Associate professor
email	haris.istvan@emk.bme.hu

1.8 Department

Department of Structural Engineering

1.9 Website

https://epito.bme.hu/BMEEOHSA-A2
https://fiek2.mywire.org/course/view.php?id=442

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

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1.12 Prerequisites

Strong prerequisites:

- RC and Masonry Structures (BMEEOHSAS42)
- Timber Structures (BMEEOHSAS44)

1.13 Effective date

5 February 2020

2. Objectives and learning outcomes

2.1 Objectives

The goal of the subject is to learn the design specialities of the constructions, constructional elements applied in building constructions. The students will study about monolithic and prefabricated prestressed structures, stiffening systems of high rise buildings, glued laminated structures of timber halls.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. knows the terminology of building constructions,
2. knows the action effects on building constructions,
3. knows the steps of design for prestressed constructions,
4. knows the sizing methods of connections in building constructions,
5. knows the formation of different stiffening systems for building constructions, its main features and the basis of sizing.

B. Skills

1. is able to make sizing models for reinforced concrete building construction and timber structures,
2. is able to determine the loads and effects on building constructions according to the code,
3. is able to size monolithic and prestessed concrete structures according to the code,
4. is able to size structural elements of timber constructions,
5. is able to analyse and design the different global stiffening systems that may also differ in ground plane.

C. Attitudes

1. Extends his knowledge with continuous studying,
2. open to the means of information technology,
3. is striving to know the methods for solution of structural problems,
4. is striving for proper solution of tasks.

D. Autonomy and Responsibility

1. Independently performs the solution of tasks in building constructions and solution on the basis of given sources,

2. is open for critics,
3. uses a systematic approach of problems.

2.3 Methods

Lectures Calculation practice, communication written and oral, using IT facilities and techniques, home works prepared independently.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Special requirements and formation of high-rise buildings. / Loads and sizing.
2.	Earthquake / Types of reinforced concrete floors. Calculation models. Flat slabs resting on columns.
3.	Prestressing I. / Prestressing II.
4.	Design of prestressed beam I. / Stiffening systems of the buildings. Structural elements of the stiffening systems
5.	Timber halls I. / Timber halls II.
6.	Timber halls III. / Timber halls IV.
7.	Design of timber connections, Glued laminated beams / Frame nodes fire effect.
8.	Timber halls V. / Timber halls VI.
9.	Design of prestressed beam II. / Analysis of the stiffening systems of buildings – Wall stiffness I.
10.	Analysis of the stiffening systems of buildings – Wall stiffness II.
11.	Coupled walls / Co-working of frames and walls
12.	Design of prestressed beam III. / Frames stiffened by masonry infill
13.	Stiffening system, core structures I.
14.	Stiffening system, core structures II., Deep beams.

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

a) Textbooks:

1. Stafford Smith, B. and Coull, A.,: Tall building Structures. Analysis and Design. 1991
2. Zalka K. A.: Structural Analysis of Regular Multi-Storey Buildings
3. Porteous, J and Kermani, A.: Structural Timber Design to Eurocode 5

b) Online materials:

1. Farkas Gy. - Kiss. R.: Reinforced Concrete Buildings
2. Haris I. – Koris K.: Design of prestressed beams

2.6 Other information

1. Attendance to lectures is compulsory. The signature and credits from the subject will be refused to students missing more than 6 lectures.
2. Attendance to practical classes is compulsory. The signature and credits from the subject will be refused to students missing more than 3 practical classes.
3. Students are evaluated based on their actual individual performance. Students are required to show evidence of their own knowledge and skills. Submitting a work of others, obtaining or giving unauthorized help (e.g. during an exam or test) cheating and plagiarism in any form is unacceptable. Whoever violate the respective Regulations of the University will be given a failing grade (1), without the possibility of retake and repeat, and will be reported to the Dean's Office.

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:

huszar.zsolt@epito.bme.hu

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 0. above and the evaluation of student performance occurs via the 3 home works and the exam. First the written part of the exam should be passed. The written part is successful if 42% of the total points is obtained. The oral part can be taken only with a successful written part. That will be successful if its result is above 50%

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. homework	HW1	A.1-A.5; B.1-B.5; C.1-C.4; D.1-D.3
2. homework	HW2	A.1-A.5; B.1-B.5; C.1-C.4; D.1-D.3
3. homework	HW3	A.1-A.5; B.1-B.5; C.1-C.4; D.1-D.3
attendance and activity	A	A.1-A.5; B.5; D.1-D.3
written examination	W	A.1-A.5; B.1-B.5; C.1-C.4; 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
HW1	10%
HW2	10%
Hw3	10%
Total achievable during the semester	30%
Exam	70%
Sum	**100%**

3.4 Requirements and validity of signature

The signature can be obtained if the student got 50% of all the points in chapter 3.3 available in the semester (0.5*30%). Each homework must be submitted and at least 40% of the points per homework must be achived. Semester results achieved earlier can be considered retroactively 6 semesters.

3.5 Grading system

Grade	Points (P)
excellent (5)	80<=P
good (4)	70<=P<80%
satisfactory (3)	60<=P<70%
passed (2)	50<=P<60%
failed (1)	P<50%

3.6 Retake and repeat

1 The home work can be submitted on the last day of the replacement week till 16:00 or electronically sent till 23:59 with payment of the fee given in the regulation.
2 The submitted and accepted home work can be repaired free of charge until the deadline given in the 1.

chapter.

3.7 Estimated workload

Activity	**Hours/semester**
contact hours	14×3=42
preparation for the courses	14×1=14
homework	14
preparation for the examination	80
Sum	**150**

3.8 Effective date

26 August 2021

This Subject Datasheet is valid for:

2023/2024 semester I