Civil Engineering Automation, Modelling - BMEEOHSMB51 - 2024/25/2

I. Subject Specification

1. Basic Data

1.1 Title

Civil Engineering Automation, Modelling

1.2 Code

BMEEOHSMB51

1.3 Type

Module with associated contact hours

1.4 Contact hours

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

1.5 Evaluation

Exam

1.6 Credits

5

1.7 Coordinator

name	Dr. Attila László Joó
academic rank	Associate professor
email	joo.attila@emk.bme.hu

1.8 Department

Department of Structural Engineering

1.9 Website

https://epito.bme.hu/BMEEOHSMB51
https://edu.epito.bme.hu/course/view.php?id=3568

1.10 Language of instruction

english

1.11 Curriculum requirements

Compulsory in the Construction Information Technology Engineering (MSc) programme

1.12 Prerequisites

1.13 Effective date

27 February 2023

2. Objectives and learning outcomes

2.1 Objectives

The course's primary aim is to present and apply the application possibilities of the algorithmizing and programming competencies learned in the first semester in digitization tasks in the construction industry. During lectures, students will learn about domestic and international design, production, and construction-related structural application examples that increase the efficiency of various construction companies and projects, which are updated every six months. In the exercises, the students solve small algorithmizing and programming tasks corresponding to their BSc level.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. has fundamental knowledge in the areas of algorithmic procedures and programming languages
2. knows the connection possibilities between various programming languages and software systems

B. Skills

1. recognizes algorithmic possibilities and can develop efficiency-enhancing procedures
2. able to generalize and extend processes for broader use
3. professionally communicates using programming technical terms
4. selects the best software for particular automation procedures

C. Attitudes

1. committed to efficiency gains

D. Autonomy and Responsibility

1. independently looking for development opportunities

2.3 Methods

Presentation of domestic and international examples of automation and efficiency improvement through corporate relations, partly with invited lecturers. Presentation of practical digitization examples and joint implementation in a computer laboratory. Independent task solution, homework.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Course introduction. Tekla introduction. Tekla automation example.
2.	Compulsory consultation.
3.	Axis FEM software introduction. Axis FEM software python automation example.
4.	Compulsory consultation.
5.	Revit introduction.Revit automation example.
6.	Compulsory consultation.
7.	Parametric design introduction.Parametric design automation example.
8.	Compulsory consultation.
9.	Project work.
10.	Preparation for documentation, presentations, and soft skills.
11.	Group presentations of Tekla automation HW. Group presentations of Axis FEM software automation HW.
12.	Consultation and extended submission.
13.	Group presentations of Revit automation HW.Group presentations of parametric design automation HW.
14.	Consultation and extended submission.

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

Mandatory literature:

1. Miroslaw J. Skibniewski (Editor-in-Chief): Automation in Construction, An International Research Journal, Elsevier (www.eisz.hu)

Recommended literature:

2. Daniotti, Bruno (editor), Gianinetto, Marco (editor), Della Torre, Stefano (editor): Digital Transformation of the Design, Construction and Management Processes of the Built Environment, Springer Open, (2020), ISBN: 978-3-030-33570-0

2.6 Other information

2.7 Consultation

Consultation dates can be found in the schedule of the course.

This Subject Datasheet is valid for:

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The assessment of the learning outcomes is specified in clause 2. above, and the continuous evaluation of student performance occurs via homework assignments, class questions, consultations, and oral exam.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
1. homework	HW 1	A.1-2; B.1-4; C.1; D.1
2. homework	HW 2	A.1-2; B.1-4; C.1; D.1
3. homework	HW 3	A.1-2; B.1-4; C.1; D.1
4. homework	HW 4	A.1-2; B.1-4; C.1; D.1
Exam	E	

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
HW 1	25
HW 2	25
HW 3	25
HW 4	25
Sum	**100%**

3.4 Requirements and validity of signature

Minimum 70% presence on lectures and consultations, successfully finish the HW's and oral exam.

3.5 Grading system

Grade	Points (P)
excellent (5)	90%<=P
good (4)	75%<=P<90%
satisfactory (3)	65%<=P<75%
passed (2)	40%<=P<65%
failed (1)	P<40%

3.6 Retake and repeat

The home works can be re-assigned one week after the original deadline by paying the related fees. The deadlines for the home works can be found on the homepage of the subject.

3.7 Estimated workload

Activity	**Hours/semester**
contact hours	14x2=28
self-learning	4x10=40
homework	4x15=60
preparation for presentations	22
Sum	150

3.8 Effective date

27 February 2023

This Subject Datasheet is valid for: