Civil Engineering Informatics - BMEEOFTAT42

I. Subject Specification

1. Basic Data

1.1 Title

Civil Engineering Informatics

1.2 Code

BMEEOFTAT42

1.3 Type

Module with associated contact hours

1.4 Contact hours

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

1.5 Evaluation

Midterm grade

1.6 Credits

5

1.7 Coordinator

name	Dr. Árpád BARSI
academic rank	Professor
email	barsi.arpad@emk.bme.hu

1.8 Department

Department of Photogrammetry and Geoinformatics

1.9 Website

https://epito.bme.hu/BMEEOFTAT42
https://fiek2.mywire.org/course/view.php?id=430

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Compulsory in the Civil Engineering (BSc) programme

1.12 Prerequisites

Strong prerequisites:

- Civil Engineering CAD (BMEEOFTAT41)

1.13 Effective date

17 June 2020

2. Objectives and learning outcomes

2.1 Objectives

The aim of the course is to introduce the IT tools that help the work of civil engineers. The aim is to identify the IT problems that arise during the civil engineering practice, to manage their formulation and solution in an engineering environment suitable for modern integrated calculations.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. knows the mathematical methods of processing measurement data,
2. knows the basic tools and methods of algorithmization,
3. knows the tasks of IT system design,
4. is familiar with the elementary toolbox of engineering presentation graphics.

B. Skills

1. is able to automate the solution of basic engineering tasks using algorithms,
2. able to process simple measurement data using algorithms,
3. is able to properly document the calculation process of the task solution,
4. able to predict future events based on time series,
5. able to automate the solution of equations and systems of equations.

C. Attitudes

1. strives for a error-free solution.

D. Autonomy and Responsibility

1. accepts substantiated critical remarks,
2. uses a systematic approach to solving tasks,
3. checks and validates his work in all cases.

2.3 Methods

Lectures, computer exercises, software usage skills, algorithmization techniques.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Measurement processing with IT tools, getting acquainted with the program environment
2.	Basics of algorithmization, preparation of calculation documentation
3.	Data processing, time series management, simple model fitting
4.	Control structures, user interaction
5.	Control structures with examples
6.	Control structures with examples
7.	Engineering problem solving with algorithms, partial summary
8.	Description of data types
9.	Solving functions and informatics, equations and systems of equations
10.	Function analysis, optimization, regression
11.	Multivariate optimization, definition of functions
12.	Computer graphics, definition of functions
13.	Geometric transformations, modularization, recursion
14.	Partial summary

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

Downloadable materials:

1. Electronic lecture notes
2. Examples of each topic in the educational framework

Study room:

The department provides a "study room" option outside of class time to increase student success, which is a collaborative approach to solving problems in the lab under faculty guidance.

2.6 Other information

You can use your own laptop during the practice courses with the permission of the instructor.

2.7 Consultation

Consultation dates: as specified on the department's website or in advance by e-mail

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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

The assessment of the learning outcomes formulated in point 2.2 is based on two theoretical tests, a practical test and a midterm test.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
First theoretical test	TT1	A.1-A.3; B.2; C.1; D.1
Second theoretical test	TT2	A.3-A.4; B.1; C.1; D.1-D.3
Practical test	PT	A.1-A.3; B.1-B.5; C.1; D.1-D.3
Midterm test	MT	A.1-A.2; B.1-B.3; C.1; 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
TT1 - TT2	50%
PT	20%
MT	30%
Sum	**100%**

Theoretical tests are unsuccessful if they do not reach the 12.00 point separately, and the practical test does not reach the 15.00 point.

3.4 Requirements and validity of signature

No signature can be obtained on the subject.

3.5 Grading system

Grade	Points (P)
excellent (5)	85<=P
good (4)	75<=P<85
satisfactory (3)	65<=P<75
passed (2)	50<=P<65
failed (1)	P<50

The presentation of the Matlab Onramp certificate is required to determine the semester result.
The semester is unsuccessful if the total score does not reach 50.00 points.

3.6 Retake and repeat

The retakes of theoretical and practical tests takes place during the replacement week.

3.7 Estimated workload

Activity	Hours/semester

participation in contact classes	14×4=56
semester preparation for practice courses	14×2=28
preparation for tests	12+12+12+30=66
Sum	**150**

3.8 Effective date

17 June 2020

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Inactive courses