Information technologies - BMEEOFTMF-1

I. Subject Specification

1. Basic Data

1.1 Title

Information technologies

1.2 Code

BMEEOFTMF-1

1.3 Type

Module with associated contact hours

1.4 Contact hours

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

1.5 Evaluation

Midterm grade

1.6 Credits

5

1.7 Coordinator

name	Dr. Molnár Bence
academic rank	Associate professor
email	molnar.bence@emk.bme.hu

1.8 Department

Department of Photogrammetry and Geoinformatics

1.9 Website

https://epito.bme.hu/BMEEOFTMF-1
https://fiek2.mywire.org/course/view.php?id=3494

1.10 Language of instruction

hungarian and english

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1.11 Curriculum requirements

Compulsory in the Land Surveying and Geoinformatics (MSc) programme

1.12 Prerequisites

1.13 Effective date

1 September 2021

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2. Objectives and learning outcomes

2.1 Objectives

The course aims to give the student an insight into the tools of modern informatics. With the help of familiar technologies, you can make your GIS knowledge even more marketable. The student will gain insight into modern data collection technologies and tools, data storage, processing, analysis capabilities, and finally, data visualization. The aim of the subject is also the joint use of different information technologies, their integration in solving a complex task.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. is familiar with information technologies useful for surveyors and GIS,
2. is familiar with modern data collection technologies,
3. knows the methods of data storage, analysis, and processing,
4. is familiar with web-based data visualization technologies.

B. Skills

1. is able to select the IT tools needed to solve a particular engineering problem,
2. is able to make their engineering work more efficient with the help of a complex IT system,
3. is able to transmit and store the collected data on a network securely,
4. is able to present the results of their work in a well-understood way, to publish in a way that professionals can use,
5. is able to explore a topic and present it in the form of a lecture.

C. Attitudes

1. cooperates with the instructor and fellow students in expanding the knowledge,
2. expands his knowledge by the continuous acquisition of knowledge,
3. open to the use of information technology tools,
4. strives for an accurate and error-free solution.

D. Autonomy and Responsibility

1. they explore IT topics independently,

2. takes a systemic approach to its thinking.

2.3 Methods

Lectures, exercises, use of IT tools and techniques, independent lectures.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	IT networks
2.	Recent technologies to store data and geodata in various databases
3.	Web-based geodata visualization solutions
4.	WebGIS frameworks
5.	Mobile app development frameworks
6.	Cloud-based solutions for civil engineers
7.	Big data and IoT
8.	Data acquisition systems
9.	Utilize GPU/TPU for civil engineering tasks
10.	Augmented- and Virtual Reality (AR/VR)
11.	BIM
12.	Artifical Inteligence (AI)
13.	System integration
14.	Overview

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) Online materials:

1. Slides at Educational portal
2. Documentation links at Education Portal

2.6 Other information

2.7 Consultation

Consultation timeslot is advertised at https://epito.bme.hu/molnar-bence, or please reach out to the class coordinator by e-mail.

This Subject Datasheet is valid for:

2023/2024 semester I

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II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The learning outcomes formulated in point 2.2 are assessed based on a test, a homework assignment, and a lecture on an independently explored topic.

3.2 Assessment methods

Evaluation form	Abbreviation	Assessed learning outcomes
Test	T1	A.1-A.4; B.1-B.3
Presentation	P1	B.4-B.5; C.3-C.4; D.1
System integration	HW1	A.1-A.4; B.1-B.4; C.1-C.4; D.2

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
ZH1	33%
EA1	34%
HF1	33%
Sum	**100%**

3.4 Requirements and validity of signature

No signature can be achieved.

3.5 Grading system

The grade of those who meet the conditions of attendance is determined according to the following criteria: At least 50% of the test must be completed. The final grade is calculated on the basis of the average of the test, the homework and the presentation.

3.6 Retake and repeat

The better result will be taken into account upon test retake. In addition to the payment of the fee specified in the regulations, the homework can be submitted late in electronic form until 23:59 on the last day of the repetition week.

3.7 Estimated workload

Activity	Hours/semester
Participate in contact classes	14×3=42
Mid-semester preparation for internships	14×1=14
Preparation for the test	30
Homework	24
Self-study of selected written curriculum	40
Sum	**150**

3.8 Effective date

1 September 2021

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2023/2024 semester I