Digital surface modeling - BMEEOFTDT83

I. Subject Specification

1. Basic Data

1.1 Title

Digital surface modeling

1.2 Code

BMEEOFTDT83

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. Attila Juhász
academic rank	Associate professor
email	juhasz.attila@emk.bme.hu

1.8 Department

Department of Photogrammetry and Geoinformatics

1.9 Website

https://epito.bme.hu/BMEEOFTDT83
https://fiek2.mywire.org/course/view.php?id=2493

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 May 2021

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2. Objectives and learning outcomes

2.1 Objectives

The course consists the theorethical knowledge of digital terrain / surface modeling and analysis in depth. After completing this course, the students will understand the details of data acquisition procedures and sources used in digital elevation modeling (DEM), the structure of the databases, interpolation and analysis methods. The mathematical background of these methods will also be presented. In practice, the students will be able to collect relevant elevation data, perform spatial analysis functions, create and visualize appropriate digital elevation model in connection with environmental phenomenas of natural and built-in areas. The course reviews the entire process of elevation data acqusition, the DEM's structures, interpolation, analysis and visualization.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. The elevation data acquisition methods (operational principles, groups, characteristics)
2. Elevation data preprocession, filtering
3. Knowledge of DEM structures
4. Interpolation methods
5. Technological background of DEM analysis and visualization

B. Skills

1. Ability of creating a strucured DEM
2. Preprocessing and filtering the raw data
3. Selection of relevant interpolation method
4. Creation of static and dynamic data visulization

C. Attitudes

1. Openmind to the usage of GIS tools and solutions
2. Systematic thinking

D. Autonomy and Responsibility

1. Independent work
2. Ability in organizing and managing

2.3 Methods

Lectures, oral and written communication, usage of IT tools and technologies, Discussions, analysis and calculations during the courses.

2.4 Course outline

Hét	**Előadások és gyakorlatok témaköre**
1.	Basics of the digital elevation modeling.
2.	DEM structures
3.	Elevation data acqusition sources I.
4.	Elevation data acqusition sources II.
5.	Interpolation methods I.
6.	Interpolation methods II.
7.	Interpolation methods III.
8.	Data quality
9.	Mathematical background of 3D analysis
10.	Static and dynamic visualization
11.	DEM exercise (consultation)
12.	DEM exercise (consultation)
13.	DEM exercise (consultation)
14.	DEM exercise (consultation)

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

- Documents on the homepage of the subject.
- Web documents.

2.6 Other information

2.7 Consultation

The consultation times are listed on the department's homepage.

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This Subject Datasheet is valid for:

Inactive courses

Digital surface modeling - BMEEOFTDT83

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

The evaluation of the students knowledge (listed in 2.2) is based on a complex practical task and an oral exam.

3.2 Assessment methods

Teljesítményértékelés neve (típus)	Jele	Értékelt tanulási eredmények
Complex task	T	A.1-A.5; B.1-B.4; C.1-C.2; D.1-D.2
Oral exam	E	A.1-A.5

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

3.3 Evaluation system

Jele	Részarány
T	50%
E	50%
Összesen	**100%**

3.4 Requirements and validity of signature

The criteria of getting signature is to acquire the 50% of the potential points during the semester.

3.5 Grading system

Érdemjegy	Pontszám (P)
jeles (5)	80<=P
jó (4)	70<=P<80%
közepes (3)	60<=P<70%
elégséges (2)	50<=P<60%
elégtelen (1)	P<50%

3.6 Retake and repeat

The complex task can be replaced till the last day of the repeat week. In written form unti 16:00 or in e-form until 23:59.

3.7 Estimated workload

Tevékenység	Óra/félév
Attendance on the contact lectures	28×1=28
Praparation to the task	10
Creating the task	30
Preparation to the exam	10
Sum	**78**

3.8 Effective date

1 May 2021

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Inactive courses