Laser scanning - BMEEOFTDT81

I. Subject Specification

1. Basic Data

1.1 Title

Laser scanning

1.2 Code

BMEEOFTDT81

1.3 Type

Module with associated contact hours

1.4 Contact hours

Type	Hours/week / (days)
Consultation	2

1.5 Evaluation

Exam

1.6 Credits

3

1.7 Coordinator

name	Dr. Lovas Tamás
academic rank	Associate professor
email	lovas.tamas@emk.bme.hu

1.8 Department

Department of Photogrammetry and Geoinformatics

1.9 Website

https://epito.bme.hu/BMEEOFTDT81
https://fiek2.mywire.org/course/view.php?id=2491

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 September 2022

2. Objectives and learning outcomes

2.1 Objectives

Students accomplishing the course will have an overview of the R&D activities and trends in the field of laser scanning. They learn the latest technological developments in airborne, mobile, and terrestrial laser scanning. Besides data acquisition techniques and solutions, students study point cloud processing techniques. They have the opportunity to deepen their knowledge in a selected area of laser scanning, survey the relevant literature, and try the methods. This way the course supports PhD students to review state-of-the-art technologies and solutions and select results that can be used in their own research work.

2.2 Learning outcomes

Upon successful completion of this subject, the student:

A. Knowledge

1. Has an overview of the latest development in the field of airborne, mobile, and terrestrial laser scanning.
2. Knows the advantages and shortcomings of the particular laser scanning data acquisition methods.
3. Has an overview of the cutting edge point cloud processing techniques and solutions.
4. Knows the main engineering application fields laser scanning can support.

B. Skills

1. Evaluates the performance of the particular laser scanning technology.
2. Selects appropriate data acquisition technology considering the application requirements.
3. Selects the effective data processing method for particular tasks.
4. Is able to assess the potential of data processing techniques.

C. Attitudes

1. Cooperates with the teacher and fellow students in expanding the knowledge,
2. Expands his knowledge with the continuous acquisition of knowledge,
3. Open to the use of information technology tools,

D. Autonomy and Responsibility

1. Is able to perform own literature survey.
2. Makes responsible decisions based on consultation.

2.3 Methods

Some introductory lectures on the state-of-the-art of laser scanning, own research in a selected area, continuous consultation, home assignment.

2.4 Course outline

Hét	**Előadások és gyakorlatok témaköre**
1.	Laser scanning state-of-the-art
2.	Airborne laser scanning
3.	Mobile laser scanning
4.	Terrestrial laser scanning
5.	Point cloud processing - registration
6.	Point cloud processing - modeling
7.	Point cloud processing - segmentation
8.	Point cloud processing - classification
9.	consultation
10.	consultation
11.	consultation
12.	consultation
13.	consultation
14.	Students' presentation

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

Vosselman-Haas: Airborne and Terrestrial Laser Scanning
Shan-Toth: Topographic Laser Ranging

2.6 Other information

2.7 Consultation

Weekly opportunities discussed by supervisor.

This Subject Datasheet is valid for:

Inactive courses

II. Subject requirements

Assessment and evaluation of the learning outcomes

3.1 General rules

Learning outcomes formulated in point 2.2 are assessed on homework assignment and exam.

3.2 Assessment methods

Teljesítményértékelés neve (típus)	Jele	Értékelt tanulási eredmények
Home assignment	HW	A.1-A.4; B.1-B.4; C.1-C.3; D.1-D.2
Exam	E	A.1-A.4; B.1-B.4

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
HW	50%
E	50%
Összesen	**100%**

3.4 Requirements and validity of signature

Successfully submitted and presented home assignment.

3.5 Grading system

The final grade is calculated by the average of the HW an E.

3.6 Retake and repeat

Late submission of the home assigment is allowed on the make-up week.

3.7 Estimated workload

Tevékenység	Óra/félév
classes	28
preparing HW	40
preparing for the E	22
Összesen	**90**

3.8 Effective date

1 September 2022

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Inactive courses