Image processing - BMEEOFTDT71

I. Subject Specification

1. Basic Data

1.1 Title

IMAGE PROCESSING

1.2 Code

BMEEOFTDT71

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. Arpad 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/BMEEOFTDT71
https://edu.epito.bme.hu/course/view.php?id=4916

1.10 Language of instruction

hungarian and english

1.11 Curriculum requirements

Ph.D.

1.12 Prerequisites

1.13 Effective date

1 September 2022

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2. Objectives and learning outcomes

2.1 Objectives

By completing the image processing course, students will gain a comprehensive understanding of the creation, storage and use of digital images. They will become familiar with basic image manipulation operators and techniques, computer vision solutions and their links to other disciplines. In addition to theoretical methods, the course will also cover practical applications and development environments. Throughout the semester, individual problems are solved through independent problems, allowing PhD students to integrate image analysis technologies into their own research.

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 image processing and computer vision.
2. Knows the advantages and shortcomings of the particular image acquisition and storage methods.
3. Has an overview of the cutting-edge image processing techniques and solutions.
4. Knows the main engineering application fields images can support.

B. Skills

1. Evaluates the performance of the particular image processing 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 state-of-the-art of image processing, own research in a selected area, continuous consultation, and home assignment.

2.4 Course outline

Week	Topics of lectures and/or exercise classes
1.	Basic terms of images and image processing
2.	Image capture and storage
3.	Image features and statistics
4.	Histogram and LUT manipulations
5.	Image filtering
6.	Image segmentation and classification
7.	Basics of computer vision
8.	Consultation
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

Gonzalez - Woods: Digital Image Processing

2.6 Other information

2.7 Consultation

Weekly opportunities discussed by supervisor.

This Subject Datasheet is valid for:

2025/2026 semester I

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

Evaluation form	Abbreviation	Assessed learning outcomes
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

Abbreviation	Score
HW	50%
E	50%
Sum	**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 and E.

3.6 Retake and repeat

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

3.7 Estimated workload

Activity	Hours/semester
classes	28
preparing HW	40
preparing for the E	22
Sum	**90**

3.8 Effective date

1 September 2022

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2025/2026 semester I