



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Digital images processing [S1ETI2>POC]

Course

Field of study

Education in Technology and Informatics

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

1,00

Coordinators

dr inż. Jakub Grabski
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Lecturers

Prerequisites

Knowledge: knowledge of the programming basics in the chosen language. Skills: logical thinking, use of information obtained from the library and the Internet, programming in any programming language. Social competencies: understanding the need to learn and acquire new knowledge.

Course objective

The purpose of the course is to familiarize students with the topics related to image processing, their implementation in the Python/Matlab environment, as well as basic applications.

Course-related learning outcomes

Knowledge:

1. The student should know the basic concepts of digital images and the methods for their processing and analysis.
2. The student should know the basic applications of basic image processing methods.

Skills:

1. The student is able to acquire information on digital image processing and methods of their analysis .

2. The student is able to use selected digital image processing methods in Python/Matlab environment).
3. The student is able to plan the sequence of application of image processing methods for its correct analysis.

Social competences:

1. The student is aware of the importance of non-technical aspects of engineering activities.
2. The student is able to set priorities for the implementation of specific tasks.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Credit for the lecture based on the points earned on the test in the last class. Passing requires obtaining more than 50% of the points: >50% - dst, >60% - dst plus, >70% - db, >80% - db plus, >90% points - bdb.

Programme content

The programme content covers digital image processing techniques - classical point and contextual image processing methods as well as machine learning techniques, with examples of their applications.

Course topics

Lecture:

1. Basic concepts related to digital images.
2. Image histogram.
3. Point transformations.
4. Edge detection filters.
5. Morphological operations.
6. Fourier and Hough transforms in image analysis.
7. Machine learning techniques in digital image analysis.
8. Final test.

Teaching methods

Lecture: A multimedia presentation illustrated with examples in Python/Matlab.

Bibliography

Basic:

1. Z. Wróbel, R. Koprowski, Praktyka przetwarzania obrazów z zadaniami w programie Matlab, Akademicka Oficyna Wydawnicza EXIT, Warszawa 2012.
2. R. Tadeusiewicz, P. Korohoda, Komputerowa analiza i przetwarzanie obrazów, Wydawnictwo Fundacji Postępu Telekomunikacji, Kraków 1997.

Additional:

1. D. Sankowski, W. Mosorov, K. Strzecha, Przetwarzanie i analiza obrazów w systemach przemysłowych. Wybrane zastosowania, Wydawnictwo Naukowe PWN, Warszawa 2020.

Breakdown of average student's workload

| | Hours | ECTS |
|---|-------|------|
| Total workload | 28 | 1,00 |
| Classes requiring direct contact with the teacher | 15 | 0,50 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 13 | 0,50 |