SYLLABUS

Name: *Medical Image Analysis (MakAu-DS>SM3MIA19)*
Name in Polish:
Name in English: *Medical Image Analysis*

Information on course:

Course offered by department: Faculty of Automatic Control, Electronics and Computer Science
Course for department: Silesian University of Technology

Default type of course examination report:
ZAL

Language:
English

Short description:
The main goal of the course is to show students how to apply the existing image processing, statistical data analysis, and machine learning tools in analyzing selected types of biological and medical images.

Description:
ECTS: 2 Total workload: 50 hours (30 contact hours, 20 students' work hours) Forms of contact hours: Lecture 15h Laboratory 15h Students' own work: preparation for classes, preparation of the reports, preparation to test. Number of ECTS points obtained in classes with direct participation of an academic teacher: 2 Number of ECTS points obtained in practical classes (laboratories, projects): 1 The lecture will introduce the topic of medical image analysis, discuss existing problems, and describe analysis methods with many applications. During laboratories, students will analyze mostly real patient data, including cancer patients' images, by testing different algorithms or providing their solutions. Various data types will be discussed during lectures and analyzed during laboratories: •2D gel electrophoresis images •Histopathological images •Radiographs (X-rays) •Computed tomography images •Magnetic resonance imaging

Bibliography:
Klaus D. Toennies, Guide to Medical Image Analysis. Methods and Algorithms. Springer Geoff Dougherty, Medical Image Processing. Techniques and Applications. Springer

Learning outcomes:
Skills: Students can use: - typical technologies used in solving engineering tasks in the field of automation, robotics, electronics, telecommunications, and IT related to the subject of the selected course (K2A_U16) - basic methods, techniques, and tools used in solving simple engineering tasks in the field of automation, robotics, electronics, telecommunications, and IT related to the subject of the selected course (K2A_U18)

Assessment methods and assessment criteria:
Each laboratory is graded from 0 to 100%, and the final grade from laboratories is established as an average of all laboratory grades. The final test from the lecture theory is graded from 0 to 100%. The final grade for the subject is calculated as a weighted mean: 0.3 * test grade + 0.7*laboratory grade and equals: • 2 (fail) if <= 39.99 • 3 (dost) if from 40.00% to 49.99% • 3.5 (pdost) if from 50.00% to 59.99% • 4 (db) if from 60.00% to 69.99% • 4.5 (pdb) if from 70.00% to 79.99% • 5 (bdb) if ≥ 80.00% The syllabus is valid from the academic year 2024/25 and its content cannot be changed during the semester

Course credits in various terms:

<without a specific program>			
Type of credits	Number	First term	Last term
European Credit Transfer System (ECTS)	2	2024/2025-Z	