

COURSE DESCRIPTION CARD

Faculty of Electrical Engineering										
Field of study	Electrical and Electronic Engineering							Degree level and programme type	bachelor's degree, full time programme	
Specialization/ diploma path	-							Study profile		
Course name	Image Processing and Recognition							Course code	IS-FEE-10022W	
								Course type	elective	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter	
	15				30			No. of ECTS credits	4	
Entry requirements	-									
Course objectives	To familiarize students with the knowledge of digital images, methods of their processing and recognition.									
Course content	<p><u>Lecture:</u> Introduction to basic information about image and image processing methods: mathematical model of the image, the creation of digital images, disturbance models, image histogram alignment, context filters, morphological transformations, contouring and segmentation algorithms. Image compression and decompression methods. Image recognition tasks, application of image analysis systems. Classification of recognition methods: minimum distance methods, pattern methods, approximation methods, special methods, probabilistic methods, tree methods, graph methods. Cluster analysis and classification in the feature space. Examples of image recognition systems: face recognition systems, vision systems.</p> <p><u>Specialization workshop:</u> Testing and evaluation of selected image processing procedures on given digital images. Application of selected image processing methods. Selection of image features and recognition methods for selected classes of objects. Testing and evaluation of selected recognition methods on given images. Presentation of individual tasks of selecting image processing procedures and methods of recognizing and assessing their quality for selected classes of objects.</p>									
Teaching methods	Informative and problem lecture, discussions, implementation of projects									
Assessment method	Lecture - written test; Specialization workshop - evaluation of projects, verification of preparation for classes									
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study		
LO1	The student knows the basic concepts of the description of digital images, lists and classifies them.									

LO2	The student can identifies methods and techniques for processing and recognizing digital images.		
LO3	The student can cites and uses the basic procedures for processing digital images.		
LO4	The student can interprets the results of digital image processing.		
LO5	The student can assess the quality of image analysis methods used.		
LO6	The student is ready to work in a team, think and act creatively.		
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
LO1	written test on lecture content	L	
LO2	written test on lecture content	L	
LO3	written test on lecture content; evaluating the student's reports	L, SW	
LO4	evaluating the student's reports	SW	
LO5	evaluating the student's reports	SW	
LO6	discussion on the project, observation of students 'work in classes	SW	
Student workload (in hours)		No. of hours	
Calculation	Lecture attendance	15	
	Participation in seminar workshop	30	
	Preparation for seminar workshop	15	
	Completion of project tasks (including work on reports)	20	
	Participation in student-teacher sessions related to the classes	5	
	Preparation for and participation in the final test	20	
	TOTAL:	105	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		50	2
Student workload – practical activities		85	3
Basic references	1. Russ J., Neal B.: The image processing handbook. CRC Press, Boca Raton, 2017 2. McAndrew A.: A computational introduction to digital image processing, Boca Raton, CRC/Taylor & Francis, 2016 3. Shih F.: Image processing and pattern recognition : fundamentals and techniques, IEEE Press, John Wiley a. Sons, 2010		
Supplementary references			

Organisational unit conducting the course	Department of Photonics, Electronics and Lighting Technology	Date of issuing the programme
Author of the programme	Grażyna Gilewska, Ph. D.	28.02.2021