(faculty stamp)

COURSE DESCRIPTION

1. Course title: COMPUTER GRAPHICS AND VISION	**2. Course code:** CGAV
3. Validity of course description: 2017/2018	
4. Level of studies: Master (graduate)	
5. Mode of studies: INTRAMURAL STUDIES	
6. Field of study: Macrofaculty	
7. Profile of studies: general academic	
8. Programme: COMPUTER SCIENCE	
9. Semester: II	
10. Faculty teaching the course: Faculty of Automatic Control, Electronics and Computer Science	
11. Course instructor: dr inż Przemysław Skurowski	
12. Course classification: specialization courses	
13. Course status: obligatory	
14. Language of instruction: English	
15. Pre-requisite qualifications: Computer graphics, Artificial Inteligence, Computer programming	
16. Course objectives: The goals of the course are: to acquire knowledge of hardware and software tools used in graphics and imaging. To develop understanding of the possibilities offered by computer vision in various practical applications. To obtain skills in the use of computer graphics, image processing and image analysis for the purposes of automatic perception.	

17. Description of learning outcomes:

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1	Student acquires extended knowledge on image acquisition, digital representation, and processing	Lab report final test	Lecture	K2A_W21, K2A_W19
2	Student acquires extended knowledge on human visual information processing	Lab report final test	Lecture	K2A_W21, K2A_W19
3	Student learns to understand and use the principal techniques comprising the chain of processing from raw raster image to description of planar forms and their change over time	Lab report	Laboratory	K2A_W21, K2A_U07
4	Student acquires knowledge and advanced skills in image processing and understanding	Lab report	Laboratory	K2A_W21, K2A_U07
5	Student acquires knowledge and skills in reading reference literature and technical documentation	Lab report	Laboratory	K2A_U03, K2A_U01

18. Teaching modes and hours
Lecture / BA /MA Seminar / Class / Project / Laboratory
30/ - / - / - / - / 30

19. Syllabus description:

Lectures:

Topics cover an area of the image processing related to the computer graphics
1. Digital image representations
2. Quantization methods
3. Filtering
4. Color models – color vision in human
5. Color models in computer systems
6. Morphology and segmentation
7. Multiresolution representation and image processing
8. Edges and features detection (basics of SIFT)
9. Motion capture systems

Laboratory topics:
Topics cover selected areas of the image processing related to the computer graphics
1. Discretization of images
2. Color spaces
3. Morphology
4. Filtering
5. PCA analysis
6. SIFT feature detectors
7. Human visual system models

During the classes we also pay a visit to the external labs involved in the computer vision science.

20. Examination: yes (written)

21. Primary sources:

1. R.C.Gonzalez, R.E.Woods: Digital Image Processing

2, A.V. Oppenheim, R.W. Schafer: Digital Signal Processing

22. Secondary sources:

T.P. Zieliński: Cyfrowe przetwarzanie sygnałów od teorii do zastosowań

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/30
2	Classes	
3	Laboratory	30/30
4	Project	
5	BA/ MA Seminar	
6	Other	15/15
	Total number of hours	75/75

24. Total hours: 150

25. Number of ECTS credits: 5

26. Number of ECTS credits allocated for contact hours: 3

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2

26. Comments:

Approved:

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(date, Instructor's signature) (date, the Director of the Faculty Unit signature)