

Course Syllabus**I. General Information**

Course name	Computer image analysis
Programme	Informatics
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BA
Form of studies (full-time, part-time)	full-time
Discipline	Informatics
Language of instruction	polish

Course coordinator	Dr Krzysztof Bartyzel
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Type of class (<i>use only the types mentioned below</i>)	Number of teaching hours	Semester	ECTS Points
lecture	30	VI	6
tutorial			
classes			
laboratory classes	30	VI	
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course coordinator	Knowledge of basic and general education subjects covered by the curriculum with special emphasis on programming in the graphic environment Fundamentals of programu
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II. Course Objectives

Introduction to basic methods of digital image processing and analysis
Introduction to basic applications of methods of digital image analysis

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	Knows basic algorithms and examples of their practical implementation	K_W03, K_W11
W_02	Has a basic knowledge of the construction and management of information systems	K_W04
W_03	Has general knowledge of algorithmics, design and programming, operating systems, computer networks, software engineering, databases, artificial intelligence and computer graphics	K_W06, K_W11
SKILLS		
U_01	Is able to independently obtain and use information to solve specific computer problems from technical documentation, help files and the Internet and available literature	K_U02
U_02	Is able to use specialist vocabulary in the field of computer science	K_U04
SOCIAL COMPETENCIES		
K_01	Is aware of the level of his/her knowledge and skills, understands the need for further education and improvement of professional and personal competences	K_K01

IV. Course Content

<ul style="list-style-type: none"> * Representation of digital images, image information. * Colour models, image types and their characteristics. * Acquisition and preprocessing of digital images. * Ways of describing images, image histogram. * Basic operations on digital images. * Edge detection methods. * Skeletonisation methods. * Image filtering methods. * Morphological operations. * Examples of practical applications of digital image processing and analysis methods.

V. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods (choose from the list)	Forms of assessment (choose from the list)	Documentation type (choose from the list)
KNOWLEDGE			
W_01	Discussion, Conventional lecture	Colloquium / written exam	Completed and graded colloquium / test / written test
W_02	Discussion, Conventional lecture	Colloquium / written exam	Completed and graded colloquium / test / written

			test
W_03	Discussion, Conventional lecture	Colloquium / written exam	Completed and graded colloquium / test / written test
SKILLS			
U_01	Practical exercises design thinking	Colloquium / written exam	Completed and graded colloquium / test / written test
U_02	Practical exercises design thinking	Colloquium / written exam	Completed and graded colloquium / test / written test
SOCIAL COMPETENCIES			
K_01	Project method design thinking	Validation of practical skills	Completed and graded colloquium / test / written test

VI. criteria, weighting factors

The assessment consists of:

- * activity during classes 20% (attendance above 80%, active participation in classes)
- * credit tests 40% (the test covers theoretical issues presented at the lectures and classes)
- * completion of homework 40%.

Grades

2: 0-39%

3: 40-49%

3,5: 50-59%

4: 60-74%

4,5: 75%-84%

5: 85-100%

At grade 3 the student will be able to

- * Formulate basic concepts of digital image processing and analysis.
- * Convert the mechanisms of digital images acquisition.
- * Implement basic, simplest algorithms from digital image processing and analysis

In the grade 4 the student is able to

- * Formulate most of the concepts of processing and analysis of digital images.
- * Formulate most of the concepts of digital image processing and analysis.
- * Implement all algorithms discussed in the field of digital image processing and analysis.

In the grade 5 the student is able to

- * Formulate all the presented concepts in the field of processing and analysis of digital images.
- * Apart from the previously mentioned: present the concept of advanced algorithms (filtering, morphological operations) in digital image processing and analysis

* Perform an implementation of all the discussed and present a concept of implementation of at least one not discussed algorithm in the field of processing and analysis of digital images

VII. Grading criteria, weighting factors

Form of activity	Number of hours
Number of contact hours (with the teacher)	90
Number of hours of individual student work	60

VIII. Literature

Basic literature
Malina W., Smiatacz M.: Metody cyfrowego przetwarzania obrazów. Akademicka Oficyna Wydawnicza EXIT, Warszawa 2005
Tadeusiewicz R., Korohoda P.: Komputerowa analiza i przetwarzanie obrazów. Wydawnictwo Fundacji Postępu Telekomunikacji, Kraków 1997.
Wojnar L., Majorek M.: Komputerowa analiza obrazu. Fotobit – Design, Warszawa 1994
Additional literature
Pavlidis T.: Grafika i przetwarzanie obrazów. WNT, Warszawa 1987
Tadeusiewicz R., Flasiński M.: Rozpoznawanie obrazów. PWN, Warszawa 1991