MODULE SPECIFICATION

Module code	
Module title in Polish	**Teledetekcja i fotointerpretacja**
Module title in English	**Remote Sensing and Photointerpretation**
Module running from the academic year	**2016/2017**

A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	**Surveying and Cartography**
Level of qualification	**first cycle** (first cycle, second cycle)
Programme type	**academic** (academic/practical)
Mode of study	**full-time** (full-time/part-time)
Specialism	**all**
Organisational unit responsible for module delivery	**The Department of Geotechnical Engineering. Geomatics and Waste Management**
Module co-ordinator	**Beata Hejmanowska, PhD hab., Eng., Professor of the University**
Approved by:	**Ryszard Florek-Paszkowski, PhD, Eng.**

B. MODULE OVERVIEW

Module type	**core module** (core/programme-specific/elective HES*)
Module status	**compulsory module** (compulsory/optional)
Language of module delivery	**English**
Semester in the programme of study in which the module is taught	**semester 4**
Semester in the academic year in which the module is taught	**summer semester** (winter semester/summer semester)
Pre-requisites	**None** (module code/module title, where appropriate)
Examination required	**No** (Yes/No)
ECTS credits	**4**

* elective HES – elective modules in the Humanities and Economic and Social Sciences

Mode of instruction	lectures	classes	laboratories	project	others
Total hours per	30		15		

semester					

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C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to familiarise basic knowledge as regards remote sensing and photointerpretation. A student learns the principles of image interpretation, learns how to read remote sensing images. Moreover, a student acquires basic knowledge on automatic thematic information extraction from images. The aim of the lectures and laboratories is to become familiarised with theoretical fundamentals of remote sensing and photointerpretation (as well as acquiring basic practical skills in this respect).

Module outcome code	Module learning outcomes	Mode of instruction *(l/c/lab/p/ others)*	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student acquires basic knowledge on obtaining remote sensing data as well as utilising remote sensing methods and technologies to obtain spatial data (useful for building topographical and thematic databases).	l/l	GiK_W19	T1 A_W03 T1 A_W05 T1 A_W07
W_02	A student obtains basic knowledge on photointerpretation.	l/l	GiK _W25	T1 A_W05 T1 A_W07
W_03	A student acquires fundamental knowledge on processing remote sensing images.	l/l	GiK _W25	T1 A_W05 T1 A_W07
U_01	A student has practical ability of interpreting images in processing remote sensing data.	l	GiK _U11	T1A_U07, T1A_U08 T1A_U09
U_02	A student can implement remote sensing data in practical applications.	l	GiK _U01 GiK _U03 GiK _U04	T1A_U01, T1A_U05, T1A_U06,
U_03	A student can interpret the contents of remote sensing images; furthermore, a student can use the techniques of digital image processing.	l	GiK _U11	T1A_U07, T1A_U08 T1A_U09
K_01	A student understands environmental aspects of implementing remote sensing images in practice.	l/l	GiK _K05	T1A_K02
K_02	A student understands the significance remote sensing data in the decision-making process.	l/l	GiK _K06	T1A_K03

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1-4	The fundamentals of remote sensing, EM radiation, the interaction EM radiation in atmosphere and at the object level, atmospheric windows, and multi-spectral remote sensing.	W_01
5-9	The principles of image remote sensing, digital image processing, enhancing, a histogram, colour compositions, spectral curves, and interpretation keys.	W_02
9-13	Automatic classification of images, non-supervised and supervised, accuracy analyses.	W_03, K_01, K_02
14-15	The applications of remote sensing. The fundamentals of utilising remote sensing methods and technologies to obtain spatial data for building topographic and thematic databases.	W_01, W_03, K_02

2. Topics to be covered in the laboratories

No.	Topics	Module

		outcome code
1.	Image interpretation.	U_01
2.	Image enhancing, a histogram, contrast stretching, creating and interpreting colour compositions.	U_01
3-4	Photointerpretation keys and spectra curves.	U_02
5-6	Image classification and accuracy analysis.	U_02 U_03
7.	Calculating albedo and temperature from satellite images.	U_02 U_03

Assessment methods

Module outcome code	Assessment methods *(Method of assessment; for module skills − reference to specific project, laboratory and similar tasks)*
W_01	A test and reports on laboratory classes
W_02	A test and reports on laboratory classes
W_03	A test and reports on laboratory classes
U_01	A test and reports on laboratory classes
U_02	A test and reports on laboratory classes
U_03	A test and reports on laboratory classes
K_01	Observing a student's involvement during the classes, a discussion during the lectures and laboratory classes
K_02	Observing a student's involvement during the classes, a discussion during the lectures and laboratory classes

D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	**Study time/ credits**
1	Contact hours: participation in lectures	**30**
2	Contact hours: participation in classes	
3	Contact hours: participation in laboratories	**15**
4	Contact hours: attendance at office hours (2-3 appointments per semester)	**7**
5	Contact hours: participation in project-based classes	
6	Contact hours: meetings with a project module leader	**-**
7	Contact hours: attendance at an examination	**-**
8		
9	**Number of contact hours**	**52** *(sum)*
10	**Number of ECTS credits for contact hours** *(1 ECTS credit =25-30 hours of study time)*	**2.08**
11	Private study hours: background reading for lectures	**13**
12	Private study hours: preparation for classes	**-**
13	Private study hours: preparation for tests	**13**
14	Private study hours: preparation for laboratories	**10**
15	Private study hours: writing reports	**-**
16	Private study hours: preparation for a final test in laboratories	**12**
17	Private study hours: preparation of a project/a design specification	**-**
18	Private study hours: preparation for an examination	**-**
19		
20	**Number of private study hours**	**48** *(sum)*
21	**Number of ECTS credits for private study hours** *(1 ECTS credit =25-30 hours of study time)*	**1,92**
22	**Total study time**	**100**
23	**Total ECTS credits for the module** *(1 ECTS credit =25-30 hours of study time)*	**4**
24	**Number of practice-based hours** *Total practice-based hours*	**45**
25	**Number of ECTS credits for practice-based hours** *(1 ECTS credit =25-30 hours of study time)*	**1,6**

E. READING LIST

References	
Module website	