MODULE SPECIFICATION

Module code	
Module title in Polish	**Teledetekcja i fotointerpretacja**
Module title in English	**Remote Sensing in Economy, Thematic Maps**
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 6
Semester in the academic year in which the module is taught	summer semester (winter semester/summer semester)
Pre-requisites	No requirements (module code/module title, where appropriate)
Examination required	no (Yes/No)
ECTS credits	6

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

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

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C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to acquaint students with basic knowledge concerning remote sensing and photointerpretation. Students get knowledge on the basis of photointerpretation and learn to "read" the image. Students get basic knowledge of automatic data extraction from remote sensing images. The objectives of the lectures, laboratory and project are theoretical background of remote sensing and its practical applications as well.

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	Students get basic knowledge of the acquisition of remote sensing data.	l/l/p	GiK_W19	T1 A_W03 T1 A_W05 T1 A_W07
W_02	Students acquire basic knowledge about photointerpretation.	l/l/p	GiK _W25	T1 A_W05 T1 A_W07
W_03	Students have basic knowledge about remote sensing data processing.	l/l/p	GiK _W25	T1 A_W05 T1 A_W07
U_01	Students have practical ability in image interpretation and remote sensing data processing.	l/p	GiK _U11	T1A_U07, T1A_U08 T1A_U09
U_02	Students are able to implement remote sensing data in practical applications.	l/p	GiK _U01 GiK _U03 GiK _U04	T1A_U01, T1A_U05, T1A_U06,
K_01	Students understand environmental aspects of the implementation of remote sensing image.	l/l/p	GiK _K05	T1A_K02
K_02	Students understand responsibilities of remote sensing data applications for decision support.	l/l/p	GiK _K06	T1A_K03

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1-2	The background of remote sensing, electromagnetic (em) radiation, interaction in the atmosphere, interaction between object and em radiation, atmospheric windows, multispectral remote sensing.	W_01
3-4	Image processing, image enhancements, histogram, colour composite, spectral curve.	W_02
5-6	Image classification, unsupervised, supervised, accuracy analysis.	W_03, K_01, K_02
7	Remote sensing applications.	W_01, W_03, K_02

2. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1.	Image photointerpretation	U_01
2.	Image enhancement, histogram, stretching, and colour composites.	U_01
3-4	Photointerpretation key, spectral curves.	U_02
5-6	Image classification.	U_02
7.	Accuracy analysis of image classification.	U_02

3. Topics to be covered in the project

No.	Topics	Module outcome code
1-15	Land use / land cover map generation.	U_01 U_02

Assessment methods

Module outcome code	Assessment methods *(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)*
Gik_W_01	A test and an examination, laboratory projects
GiK_W_02	A test and an examination, laboratory projects
GiK_W_03	A test and laboratory projects
GiK_U_01	A test, laboratory projects
GiK_U_02	A test, laboratory projects
GiK_K_01	A test, discussions during final tutorials
GiK_K_02	Laboratory projects, discussions during final tutorials

D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	**Study time/ credits**
1	Contact hours: participation in lectures	**15**
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)	**5**
5	Contact hours: participation in project-based classes	**15**
6	Contact hours: meetings with a project module leader	**10**
7	Contact hours: attendance at an examination	**10**
8		
9	**Number of contact hours**	**70** *(total)*
10	**Number of ECTS credits for contact hours** *(1 ECTS credit =25-30 hours of study time)*	**2.8**
11	Private study hours: background reading for lectures	**10**
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	**15**
14	Private study hours: preparation for laboratories	**10**
15	Private study hours: writing reports	**10**
16	Private study hours: preparation for a final test in laboratories	**10**

17	Private study hours: preparation of a project/a design specification	**20**
18	Private study hours: preparation for an examination	**5**
19		
20	**Number of private study hours**	**80** *(total)*
21	**Number of ECTS credits for private study hours** *(1 ECTS credit =25-30 hours of study time)*	**3,2**
22	**Total study time**	**150**
23	**Total ECTS credits for the module** *(1 ECTS credit =25-30 hours of study time)*	**6**
24	**Number of practice-based hours** *Total practice-based hours*	**75**
25	**Number of ECTS credits for practice-based hours** *(1 ECTS credit =25-30 hours of study time)*	**3.0**

E. READING LIST

References	
Module website	