



### MODULE SPECIFICATION

Module code	
Module title in Polish	<b>Fotointerpretacja obrazów lotniczych i satelitarnych</b>
Module title in English	<b>Photointerpretation of Aerial and Satellite Images</b>
Module running from the academic year	<b>2016/2017</b>

### 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	<b>All</b>
Organisational unit responsible for module delivery	<b>The Department of Geotechnical Engineering, Geomatics and Waste Management</b>
Module co-ordinator	<b>Beata Hejmanowska, PhD hab., Eng., Professor the University</b>
Approved by:	<b>Ryszard Florek-Paszowski, PhD, Eng.</b>

### 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	yes (Yes/No)
ECTS credits	6

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



# Politechnika Świętokrzyska

## WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI

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



### C. LEARNING OUTCOMES AND ASSESSMENT METHODS

<b>Module aims</b>	The aim of the module is to familiarise students with knowledge on the applications of remote sensing and photointerpretation in economy. Students are acquainted with the knowledge of practical application of commonly accessible remote sensing images as well as specialist remote sensing data (together with professional utilisation of remote sensing).
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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 has knowledge on the currently available satellite images with the highest possible definition.	l/l	GiK_W19	T1 A_W03 T1 A_W05 T1 A_W07
W_02	A student is acquainted with deepened knowledge on the scope of applying remote sensing, photointerpretation in economy; a student also knows the types of satellite data and their potential application; moreover, a student knows the fundamentals of the analysis as regards aerial and satellite images.	l/l	GiK_W25 GiK_W35	T1 A_W05 T1 A_W07
W_03	A student is acquainted with fundamental knowledge on digital processing of remote sensing images in professional software.	l/l	GiK_W25 GiK_W35	T1 A_W05 T1 A_W07
U_01	A student has practical fundamental skill of image processing in remote sensing (in the PCI software).	l/p	GiK_U11	T1A_U07, T1A_U08 T1A_U09
U_02	A student is able to interpret image processing products; furthermore, a student can make a thematic study on the basis of remote sensing data.	l/p	GiK_U01 GiK_U03 GiK_U04 GiK_U11	T1A_U01, T1A_U05, T1A_U06, T1A_U07, T1A_U08 T1A_U09
U_03	A student can compare and assess the quality of remote sensing processing.	l/p	GiK_U33	T1A_U08
K_01	A student understands environmental aspects of implementing remote sensing images in practice (including in the monitoring post-mining areas).	l/l/p	GiK_K05	T1A_K02
K_02	A student understands the significance of remote sensing data in the decision-making process.	l/l/p	GiK_K06	T1A_K03

#### Module content:

##### 1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1-4	Removing geometrical deformations in satellite images; the differences in relations to the corrections of aerial images; discussing the algorithms for geometrical corrections. Utilising specialist PCI software.	
5-9	The fusion of multi-spectral remote sensing images with diverse spatial definition. Discussing a basic IHS algorithm. The functionality of the PCI software as regards image merging, the classification of images and accuracy analyses of the classification result. Creating and interpreting vegetation indices. Comparing the functionality of free software utilised as part of the course titled <i>Remote Sensing and Photointerpretation</i> with the functionality of the commercial PCI software.	



9-13	High definition satellite images (GeoEye and WorView); spatial, spectral, radiometric, and time definition. Information potential of high definition satellite images (drawing particular attention to new spectral channels).	
14-15	Creating new thematic maps on the basis of remote sensing images. The applications of remote sensing in economy drawing particular attention to the utilisation of remote sensing images in the IACS system (LPIS and control) as well as monitoring reclamation processes of post-mining areas. The applications of remote sensing for the needs of detailed analyses of environmental components on the basis of water and soil.	

### 2. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1-2	The analysis of the selected publications as regards remote sensing in terms of the practical application of the published methods of processing remote sensing images.	U_02
3-4	Geometrical correction of satellite images in the PCI software (orthoengine) as well as ILWIS.	U_01
5-6	Merging multi-spectral images with the use of various algorithms in PCI and with the IHS method in the ILWIS software.	U_01
7	Creating vegetation indices together with their interpretation.	U_02
8.	The classification of multi-spectral images together with accuracy analysis in the PCI software.	U_01 U_02 U_03 K_01 K_02

### 3. Topics to be covered in the project

No.	Topics	Module outcome code
1-3	Initial image processing, geometrical correction, pansharpener (individually selected analysis area).	U_01
4-7	Creating a thematic map (individual examples).	U_02 U_03 K_01 K_02

### Assessment methods

Module outcome code	Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i>
W_01	A test, project assessment, reports on laboratory classes, and an examination
W_02	A test, project assessment, reports on laboratory classes, and an examination
W_03	A test, project assessment, reports on laboratory classes, and an examination
U_01	A test, project assessment, reports on laboratory classes, and an examination
U_02	A test, project assessment, reports on laboratory classes, and an examination
U_03	A test, project assessment, reports on laboratory classes, and an examination
K_01	A discussion during tutorials, obtaining a credit, and an examination
K_02	A discussion during tutorials, obtaining a credit, and an examination



# Politechnika Świętokrzyska

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**WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI**



### 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)	4
5	Contact hours: participation in project-based classes	15
6	Contact hours: meetings with a project module leader	4
7	Contact hours: attendance at an examination	2
8		
9	<b>Number of contact hours</b>	<b>70</b> <i>(total)</i>
10	<b>Number of ECTS credits for contact hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>2.8</b>
11	Private study hours: background reading for lectures	20
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	20
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	10
18	Private study hours: preparation for an examination	
19		
20	<b>Number of private study hours</b>	<b>80</b> <i>(total)</i>
21	<b>Number of ECTS credits for private study hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>3.2</b>
22	<b>Total study time</b>	<b>150</b>
23	<b>Total ECTS credits for the module</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>6</b>
24	<b>Number of practice-based hours</b> <i>Total practice-based hours</i>	<b>74</b>
25	<b>Number of ECTS credits for practice-based hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>3.0</b>

### E. READING LIST

References	
Module website	