



### MODULE SPECIFICATION

Module code	
Module title in Polish	<b>Fotogrametria naziemna, lotnicza i satelitarna</b>
Module title in English	<b>Terrestrial, Air and Satellite Photogrammetry</b>
Module running from the academic year	<b>2016/2017</b>

### A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	<b>Surveying and Cartography</b>
Level of qualification	<b>first cycle</b> (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	Ryszard Florek-Paszkowski, PhD, Eng.
Approved by:	Ryszard Florek-Paszkowski, PhD, Eng.

### B. MODULE OVERVIEW

Module type	core module (core/programme-specific/elective HES*)
Module status	<b>Non-compulsory</b> compulsory module (compulsory/optional)
Language of module delivery	English
Semester in the programme of study in which the module is taught	<b>semester 5</b>
Semester in the academic year in which the module is taught	<b>Winter semester</b> (winter semester/summer semester)
Pre-requisites	<b>No requirements</b> (module code/module title, where appropriate)
Examination required	<b>Yes</b> (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			30	



### C. LEARNING OUTCOMES AND ASSESSMENT METHODS

<b>Module aims</b>	The aim of the module is to acquaint students with basic knowledge on the applications of earth, aerial, and satellite photogrammetry. A student becomes familiarised with knowledge on practical design of a photogrammetric flight, photogrammetric orientation (together with preparing an orthophotomap). The objective of the lectures, laboratory and project classes is to acquire basic information concerning the utilization of photogrammetric photos from various sources (particularly in the process of creating an orthophotomap).
--------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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 basic knowledge on geometric reconstruction of space on the basis of photogrammetric photos.	l	GiK_W02	T1 A_W01, T1 A_W03
W_02	A student is acquainted with basic knowledge on photogrammetric methods and technologies as well as the applications of aerial and satellite photogrammetry to obtain spatial data, building topographic and thematic databases (and for documentation purposes).	l	GiK_W19	T1 A_W03, T1 A_W05, T1 A_W07
W_03	A student is familiarised with basic knowledge of development trends in the field of remote methods concerning survey data about the terrain.	l	GiK_W24	T1 A_W05, T1 A_W07
W_04	A student knows basic methods, techniques, and tools applied while solving engineering tasks as regards photogrammetry.	l/p	GiK_W27	T1 A_W07
W_05	A student has knowledge on close-range photogrammetry (which concerns the existing sensors and their calibration, terratriangulation, 3D models and visualisations); a student knows the principles of obtaining data from laser scanning; finally, a student has knowledge on orientating and gluing scans.	l	GiK_W34	T1 A_W03, T1 A_W06
U_01	A student can take survey measures on images and make calculations in order to obtain data for basic photogrammetry products; moreover, a student can practically apply the photogrammetric techniques and technologies; a student can also take photogrammetric engineering measurements.	p	GiK_U17	T1A_U08 T1A_U14
U_02	A student can utilise photogrammetric tools to solve engineering task and prepare maps.	p	GiK_U16 GiK_U18	T1A_U08, T1A_U13, T1A_U09
U_03	A student can prepare an engineering project as regards photogrammetry.	p	GiK_U07 GiK_U23	T1A_U03, T1A_U06, T1A_U15, T1A_U16
K_01	A student is aware of the importance and knows non-technical aspects and effects of surveying activity (including its impact on the economy) as well as the associated responsibility for the decisions made.	l/p	GiK_K05	T1A_K02
K_02	A student is aware of the responsibility for teamwork assignment realisation; furthermore, a student can co-operate and work in a team during the realisation	l/p	GiK_K06 GiK_K07	T1A_K03



	of various engineering projects.		
--	----------------------------------	--	--

### Module content:

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

No.	Topics	Module outcome code
1.	Ground and aerial recording cameras and scanners utilised in photogrammetry. Satellite imaging and scanning.	W_04 W_05
2-3	Planning a photogrammetric flight.	W_01 W_02
4-5	Photogrammetric orientation on the PCI Geomatica photogrammetric station.	W_02 W_04 K_01
6-7	Orthorectification, orthophotomap, and thematic patches. Preparing a cadastre orthophotomap.	W_01 W_02 K_02
8.	Stereodigitalisation for updating a base map.	W_02 W_04
9 - 10.	The applications of earth, aerial, and satellite photogrammetry.	W_02 W_03 W_04
11 – 12.	Photogrammetric inventory of monuments and objects.	W_02 W_04 W_05
13 – 14.	Photogrammetric testing of displacements and deformations of smooth structures and engineering objects.	W_02 W_04 W_05
15.	Pan-sharpening in PCI Geomatica as optimisation of the geometry and radiometry of a satellite image for the photointerpretation and measurement concerning a 3D model.	W_02 W_03

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

No.	Topics	Module outcome code
1 – 4.	Planning a photogrammetric flight.	U_01 U_02 K_02
5 – 8.	Photogrammetric orientations on the PCI Geomatica photogrammetric station; orthorectification for preparing an orthophotomap.	U_02 U_03 K_02
9 – 12.	Stereodigitalisation of the 3D model on the PCI Geomatica photogrammetric station.	W_04 U_01 U_02 K_01
13 – 15.	Pan-sharpening in PCI Geomatica as the optimisation of geometry and radiometry concerning a satellite image.	W_04 U_01 U_02 K_01

### 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 and project assessment
W_02	A test and project assessment
W_03	A test and project assessment
W_04	A test and project assessment



# Politechnika Świętokrzyska

## WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI

U_01	A test and project assessment
U_02	A test and project assessment
U_03	A test and project assessment
K_01	A test, a discussion during tutorials, and obtaining a credit
K_02	Project assessment, a discussion during tutorials, and obtaining a credit



### 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	
4	Contact hours: attendance at office hours (2-3 appointments per semester)	2
5	Contact hours: participation in project-based classes	30
6	Contact hours: meetings with a project module leader	5
7	Contact hours: attendance at an examination	3
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	15
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	15
14	Private study hours: preparation for laboratories	
15	Private study hours: writing reports	10
16	Private study hours: preparation for a final test in laboratories	
17	Private study hours: preparation of a project/a design specification	20
18	Private study hours: preparation for an examination	20
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>65</b>
25	<b>Number of ECTS credits for practice-based hours</b> <i>(1 ECTS credit = 25-30 hours of study time)</i>	<b>2.6</b>

### E. READING LIST

References	
Module website	