



MODULE SPECIFICATION

Module code	
Module title in Polish	Geodezyjny monitoring środowiska
Module title in English	Surveying for Monitoring of Environment
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	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	compulsory module (compulsory/optional)
Language of module delivery	English
Semester in the programme of study in which the module is taught	semester 7
Semester in the academic year in which the module is taught	winter semester (winter semester/summer semester)
Pre-requisites	None (module code/module title, where appropriate)
Examination required	No (Yes/No)
ECTS credits	3

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

Mode of instruction	lectures	classes	laboratories	project	others
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Politechnika Świętokrzyska

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Total hours per semester	30			30	
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C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to acquaint students with the principles of applying the methods of geomatics and surveying to monitor the condition the environment. Students become familiarised with monitoring types, drawing particular attention to geometrical methods. Furthermore, students acquire detailed knowledge as regards the examples of monitoring waste slag heaps as well as the methods of examining the stability of their slopes (and providing documentation concerning the recultivation of damaged area).
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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 obtains basic knowledge on environmental engineering, which is useful to formulate and solve basic tasks as regards surveying and cartography.	l	GiK_W01	T1 A_W01
W_02	A student is acquainted with practical knowledge as regards utilising geodetic and geomatic methods to monitor environment (together with analysis methods concerning the obtained data).	l	GiK_W03 GiK_W11	T1 A_W01 T1 A_W03 T1 A_W04 T1 A_W07
W_03	A student obtains knowledge on development trends in the field of direct and remote geodetic methods of obtaining data on the terrain.	l	GiK_W24	T1 A_W05 T1 A_W07
U_01	A student is able to plan and conduct surveys, interpret the results and draw conclusions.	l/p	GiK_U14	T1 A_U08 T1 A_U09 T1 A_U13
U_02	A student can conduct a statistical analysis of data; furthermore, a student can appropriately apply the statistical methods and models; additionally, a student can prepare and realise the algorithms serving the purpose of solving a determined problem.	l/p	GiK_U15 GiK_U16	T1 A_U08 T1 A_U13
K_01	A student can appropriately determine the priorities for the realisation of a determined (by himself/herself or by other students) task; moreover, a student understands non-technical aspects and effects of geodetic activity (including its impact on the economy).	l/p	GiK_K05 GiK_K06	T1A_K02 T1A_K04

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1 – 3.	Elements subject to surveying. The types of changes in the environment, survey and analysis methods.	W_01 W_02 K_01
4 – 6.	Environment monitoring systems. Geodetic, photogrammetric, and remote sensing methods. Multi-indicator classification and characteristics of tasks concerning monitoring systems. Information flow in monitoring systems. Selecting a system according to the task, fixed and moveable monitoring networks.	W_02 W_03 U_01 K_01
7 – 9.	Multi-indicator classification and characteristics of tasks concerning monitoring systems. Information flow in monitoring systems. Selecting a system according to the task, fixed and moveable monitoring networks. Monitoring in relation to modelling (simple and complex models, forecasts).	W_02 W_03
10 – 12.	Providing documentation in the environment (legal aspects). Monitoring preventive and recultivation actions.	W_03 U_01 U_02 K_01



13 – 15.	Monitoring stockpiles and landfills. Interpreting monitoring results.	W_02 U_01 U_02 K_02
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2. Topics to be covered in the classes

No.	Topics	Module outcome code
1 – 3.	The systems of geodetic environmental monitoring.	U_01 K_01
4 – 6.	Modelling monitoring results and the visualisation of the results.	U_02 K_01
7 – 9.	Preparing maps on the basis of monitoring.	U_02 K_02
10 – 12.	Providing documentation for the needs of environmental protection and engineering on the basis of survey results.	U_01 U_02 K_01
13 - 15.	Recultivation project in relations to geodetic and photogrammetric surveys.	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
W_02	A test
W_03	A test
U_01	A test and project assessment
U_02	A test and project assessment
K_01	A test, a discussion during tutorials and obtaining a credit
K_02	A discussion during tutorials and obtaining a credit
W_01	A test



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	3
7	Contact hours: attendance at an examination	-
8		
9	Number of contact hours	65 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	2.6
11	Private study hours: background reading for lectures	5
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	
14	Private study hours: preparation for laboratories	
15	Private study hours: writing reports	-
16	Private study hours: preparation for a final test in laboratories	
17	Private study hours: preparation of a project/a design specification	5
18	Private study hours: preparation for an examination	-
19		
20	Number of private study hours	10 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	0.4
22	Total study time	75
23	Total ECTS credits for the module <i>(1 ECTS credit = 25-30 hours of study time)</i>	3
24	Number of practice-based hours <i>Total practice-based hours</i>	35
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	1.4

E. READING LIST

References	
Module website	