



MODULE SPECIFICATION

Module code	
Module title in Polish	Geodezja 2
Module title in English	Surveying 2
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	Igor Romaniszyn, PhD, Eng.
Approved by:	Ryszard Florek-Paszowski, 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 2
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	Yes (yes / no)
ECTS credits	5

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

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



semester					
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C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to familiarise students with basic knowledge on legal and technological fundamentals which concern surveying and cartography. Students are acquainted with basic notions, definitions, methods, and techniques of topographic measurements as well as with the methods of preparing surveying observations and preparing a topographic map.
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Module outcome code	Module learning outcomes	Mode of instruction (l/lab/p/others)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student has basic knowledge as regards the construction and principle of operation as regards surveying devices.	l/others	GiK_W07	T1A_W02; T1A_W04; T1A_W06
W_02	A student has basic knowledge as regards legal and technological fundamentals of taking topographic measurements (together with preparing a topographic map).	l/others	GiK_W09	T1A_W01, T1A_W03
W_03	A student knows the methods of surveying observations which are indispensable to determine the coordinates of the surveyed points.	l/others	GiK_W03	T1A_W01, T1A_W04, T1A_W07
U_01	A student can obtain information on establishing, measuring, and calculating measurement control networks (which are included in binding legal regulations); a student can assess this information and utilise it in practice.	l/others	GiK_U01	T1A_U01
U_02	A student can utilise surveying computer software in order to process the obtained measurement results.	l/others	GiK_U02	T1A_U01, T1A_U02, T1A_U03, T1A_U05, T1A_U07
U_03	A student can prepare analogue and digital maps.	l/others	GiK_U09	T1A_U04, T1A_U06
U_04	A student is able to design measurement control network, measure it, interpret measurement results, and draw conclusions.	l/others	GiK_U14	T1A_U08
K_01	A student understands the necessity of continuous education as well as development which results from legal regulations (and the necessity of raising professional qualifications).	l/others	GiK_K01	T1A_K01
K_02	A student is aware of the responsibility for surveying works; a student is also able to apply the principles of professional ethics.	l/others	GiK_K02	T1A_K01, T1A_K02, T1A_K05, T1A_K07
K_03	A student is able to co-operate in a team during topographic measurements (as well as preparing a base map).	l/others	GiK_K07	T1A_K03
K_04	A student has competences as regards the organisation of terrain works.	l/others	GiK_K11	T1A_K03

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code



1	Instruments for measuring height differences. The construction of an optical levelling instrument.	W_01 U_14
2	Axial conditions of a levelling instrument (definitions, controlling, and rectification).	W_01 U_14
3	Instruments for measuring vertical and horizontal angles. The construction of theodolite.	W_01 U_14
4	Axial conditions of a theodolite (definitions, reports, and rectification).	W_01 U_14
5	Surveying measurement uncertainty. Measurement errors and their estimators. General law of transferring mean measurements.	W_03, U_14
6	Accuracy analysis of length and angle measurements.	W_03, U_14
7	Technical conditions of making topographic measurements.	W_02, W_03, K_01, U_01, U_03
8	Technical conditions of preparing a base map.	W_02, W_03, K_01, U_01, U_03

2. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1	Checking levelling instruments.	W_02,W_03, U_01,U_03, U_14 K_03,
2	Rectifying levelling instruments.	W_02,W_03, U_01,U_03, U_14 K_03,
3	Measuring levelling lines.	W_02,W_03, U_01,U_03, U_14 K_03,
4	Measuring the lie of the land with the mesh method.	W_02,W_03, U_01,U_03, U_14 K_03,
5	Measuring the lie of the land with the dispersed points method.	W_02,W_03, U_01,U_03, U_14 K_03,
6	Contour interpolation.	W_02,W_03, U_01,U_03, U_14 K_03,
7	Measuring controls and terrain details.	W_02,W_03, U_01,U_03, U_14 K_03,
8	Measuring angles with the theodolite as well as electronic tacheometer.	W_02,W_03, U_01,U_03, U_14 K_03,
9	Measuring distance with a measuring tape and electronic tacheometer.	W_02,W_03, U_01,U_03, U_14 K_03,
10	Location measurement with the orthogonal method.	W_02,W_03, U_01,U_03, U_14 K_03,
11	Location measurement with the polar method.	W_02,W_03, U_01,U_03, U_14 K_03,
12	Preparing the results of measurements as regards measurement control network and mapping details (calculating the coordinates of the carcass points and details, mapping an analogue map, system 2000 (map emblem).	W_02, W_03,K_01, U_01,U_03
13	Preparing the results of measurements as regards measurement control network and mapping details.	W_02, W_03,K_01, U_01,U_03
14	Calculating the coordinates of carcass points and mapping details.	W_02, W_03,K_01, U_01,U_03



15	Mapping an analogue map.	W_02, W_03, K_01, U_01, U_03
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Teaching contents as regards field works

Other class number	Teaching contents	Reference to teaching results for a module
1	Terrain survey.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
2	A project and stabilisation of height measurement control network.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
3	Height measurements of measurement control network (benchmark levelling).	W_02, W_03, U_01, U_03, U_14, K_03, K_04
4	Measuring the lie of the land with the mesh method.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
5	Measuring the lie of the land with the dispersed point method.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
6	Contour interpolation.	W_02, W_03, U_01, U_03, U_14, K_03,
7	Measuring a geodetic control network and mapping details.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
8	Measuring angles with the theodolite as well as electronic tacheometer.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
9	Measuring distance with tape measure and electronic tacheometer.	W_02, W_03, U_01, U_03, U_14, K_03
10	Location measurement with the orthogonal method.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
11	Location measurement with the polar method.	W_02, W_03, U_01, U_03, U_14, K_03, K_04
12	Preparing the results of measurements as regards measurement control network and mapping details.	W_02, W_03, K_01, U_01, U_03
13	Calculating the coordinates of control network points and mapping details.	W_02, W_03, K_01, U_01, U_03
14	Mapping an analogue map.	W_02, W_03, K_01, U_01, U_03
15	System 200 (calculating a map emblem).	W_02, W_03, K_01, U_01, U_03

Assessment methods

Module outcome code	Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i>
W_02, W_03	An examination
U_01, U_03	Assessing a student's involvement during laboratory classes and field works.



U_08, U_14	
W_02, W_03, U_03, U_14,	A test
K_01, K_02, K_03, K_04	Observing a student's involvement during field works.

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	30
3	Contact hours: participation in laboratories	30
4	Contact hours: attendance at office hours (2-3 appointments per semester)	3
5	Contact hours: participation in project-based classes	
6	Contact hours: meetings with a project module leader	
7	Contact hours: attendance at an examination	2
8		
9	Number of contact hours	80 <i>(sum)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	3,2
11	Private study hours: background reading for lectures	8
12	Private study hours: preparation for classes	8
13	Private study hours: preparation for tests	
14	Private study hours: preparation for laboratories	8
15	Private study hours: writing reports	10
16	Private study hours: preparation for a final test in laboratories	3
17	Private study hours: preparation of a project/a design specification	
18	Private study hours: preparation for an examination	8
19		
20	Number of private study hours	45 <i>(sum)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	1,8
22	Total study time	125
23	Total ECTS credits for the module <i>(1 ECTS credit = 25-30 hours of study time)</i>	5
24	Number of practice-based hours <i>Total practice-based hours</i>	75
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	3,0

E. READING LIST



Politechnika Świętokrzyska

WYDZIAŁ INŻYNIERII ŚRODOWISKA, GEOMATYKI I ENERGETYKI

References	
Module website	