



MODULE SPECIFICATION

Module code	
Module title in Polish	Geomatyka
Module title in English	Geomatics
Module running from the academic year	2016/2017

MODULE PLACEMENT IN THE SYLLABUS

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 and Hydraulic Engineering
Module co-ordinator	Ryszard Florek-Paszowski, 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 1
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	Yes (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	30	15		15	



C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is a review of main branches of geomatics. Students are familiarised with basic knowledge on the following: geometry of the Earth as a planet and coordinate systems for spheres and ellipsoids (as an approximate shape of the Earth), linear and angular metrology, the calculus of errors, the system of ownership cadaster and procedures in fixed property management, the products of satellite, air, and ground photogrammetry (together with the application of teledetection in various branches of national economy).
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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 knows the principles of surveying observations which are necessary for determining the coordinates of measured points.	l/c/p	GiK_W03	T1A_W01, T1A_W04, T1A_W07
W_02	A student has basic knowledge on civil law, administrative law, tasks and competences of state and local administration bodies as regards registering lands and fixed property management.	l/c/p	GiK_W05	T1A_W02, T1A_W03
W_03	A student knows the principles of functioning electronic measuring instruments (particularly photogrammetric analogue and digital recording cameras to take photos and digital images in various ranges of electromagnetic spectra) and obtaining data in the measurement process.	l/c/p	GiK_W07	T1A_W02; T1A_W04; T1A_W06
U_01	Students have practical skills of calculating geographical and Cartesian coordinates in the system of Earth as a planet.	l/c/p	GiK_U10	T1A_U07, T1A_U08
U_02	Students have practical knowledge of checking a formal and legal condition of a fixed property (with the use of existing legal regulations as well as with the application of procedures which results from the Property Management Act.	l/c/p	GiK_U13 GiK_U22	T1A_U08, T1A_U14
U_03	Students can utilise an orthophotomap (together with specialist patches of the type of land register, underground and ground infrastructure); a student can also utilise teledetection thematic maps made on the basis of imaging from aviation and satellite ceiling in various types of national economics.	l/c/p	GiK_U11 GiK_U17	T1A_U07, T1A_U08, T1A_U09 T1A_U14
K_01	A student understands legal aspects of cadaster metrology as well as the necessity of continuous education (in relations to the continuous changes of the binding legal regulations).	l/c/p	GiK_K01	T1A_K01
K_02	A student is aware of the necessity as regards self-education as well as acting professionally, responsibly and according to the principles of professional ethics.	l/c/p	GiK_K02	T1A_K01, T1A_K02, T1A_K05, T1A_K07
K_03	Students understand the role of applying teledetection for various needs of the national economy.	l/c/p	GiK_K03	T1A_K02

Module content:

1. Topics to be covered in the lectures



No.	Topics	Module outcome code
1.	The geometry of the Earth as a planet and coordinate systems.	W_01, K_02, U_01
2.	A discussion on the Earth as a sphere, an ellipsoid, and a geoid. The parameters of the most important ellipsoids.	W_01, K_02, U_01
3.	Converting geographical coordinates into Cartesian ones (and vice versa).	W_01, K_02, U_01
4.	The systems of ownership cadaster as a register of lands and buildings.	W_02, K_01, U_02
5.	Procedures in cadaster metrology adjusted to binding legal regulations, particularly to the civil code, the Property Management Act, the Surveying and Cartography Act, the Land Registration and Mortgage Act, and the Land Development Act.	W_02, K_01, U_02
6.	The relationship between public register and their superiority in terms of data source with respect to the land register and the register of lands and buildings.	W_02, K_01, U_02
7.	Legal and formal procedures concerning unifying and dividing record parcels with reference to conditions resulting from the Property Management Act, the Land Development Act and the individual planning permission.	W_02, K_01, U_02
8.	The characteristics of ground, air, and satellite analogue and digital photos useful in photogrammetry and teledetection.	W_03, K_03, U_03
9.	The significance and utilisation of close, medium, and thermal infrared in photogrammetry and teledetection.	W_03, K_03, U_03
10.	Scanners as a method of obtaining geodata and imaging in terms of a visible spectrum and infrared.	W_03, K_03, U_03
11.	Photointerpretation as a method of recognising objects and terrain coverage.	W_03, K_03, U_03
12.	Geoportal.gov.pl as a source of cadaster information on the basis of orthophotomap as well as topographic and base map. Metrological functions of a geoportal.	W_03, K_03, U_03
13.	The concept of a cadaster division with the use of data from the geoportal.	W_02, K_01, U_02
14.	Land development in terms of the study of conditions and development directions, local development plan and the individual planning permission.	W_02, K_01, U_02
15.	Introduction to the adjustment calculus through the elements of the theory of errors. Levelling inhomogeneously accurate observations with respect to angular and linear metrological data.	W_01, K_02, U_01

2. Topics to be covered in the classes

No.	Topics	Module outcome code
1.	The geometry of the Earth as a planet and coordinate systems. A discussion on the Earth as a sphere, an ellipsoid, and a geoid. The parameters of the most important ellipsoids. Converting geographical coordinates into Cartesian ones (and vice versa).	W_01, K_02, U_01
2.	The systems of ownership cadaster as a register of lands and buildings. Procedures in cadaster metrology adjusted to binding legal regulations, particularly to the civil code, the Property Management Act, the Surveying and Cartography Act, the Land Registration and Mortgage Act, and the Land Development Act.	W_02, K_01, U_02
3.	The relationship between public register and their superiority in terms of data source with respect to the land register and the register of lands and buildings. Legal and formal procedures concerning unifying and dividing record parcels with reference to conditions resulting from the Property Management Act, the Land Development Act and the individual planning permission.	W_02, K_01, U_02
4.	The characteristics of ground, air, and satellite analogue and digital photos useful in photogrammetry and teledetection. The significance and utilisation of close, medium, and	W_03, K_03, U_03



	thermal infrared in photogrammetry and teledetection.	
5.	Scanners as a method of obtaining geodata and imaging in terms of a visible spectrum and infrared. Photointerpretation as a method of recognising objects and terrain coverage. Geoportal.gov.pl as a source of cadaster information on the basis of orthophotomap as well as topographic and base map. Metrological functions of a geoportal.	W_03, K_03, U_03
6.	The concept of a cadaster division with the use of data from the geoportal.	W_03, K_03, U_03
7.	Land development in terms of the study of conditions and development directions, local development plan and the individual planning permission.	W_02, K_01, U_02
8.	Introduction to the adjustment calculus through the elements of the theory of errors. Levelling inhomogeneously accurate observations with respect to angular and linear metrological data.	W_01, K_02, U_01

3. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1.	Converting geographical coordinates into Cartesian ones (and vice versa).	W_01, K_02, U_01
2.	Examining legal and formal conditions of fixed properties.	W_02, K_01, U_02
3.	The analysis of access to a public road in terms of establishing land easement of passage, carriage, and animal drive (together with the maintenance and repair of the media).	W_02, K_01, U_02
4.	The analysis of a thematic orthophotomap in various compilations of photographic contents and thematic patches.	W_03, K_03, U_03
5.	Recognising the elements of terrain coverage in diverse ranges of the electromagnetic spectrum.	W_03, K_03, U_03
6.	Analysing the functionality and validity of data in the geoportal.	W_03, K_03, U_03
7.	The concept of a division (together with the aspect of access to a public road).	W_02, K_01, U_02
8.	Levelling inhomogeneously accurate observations.	W_01, K_02, U_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, W_02, W_03	An examination.
U_01, U_02, U_03, K_01, K_02, K_03	Assessing the completed projects. A discussion on the completed projects.

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	15



3	Contact hours: participation in laboratories	
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	5
7	Contact hours: attendance at an examination	2
8		
9	Number of contact hours	72 <i>(sum)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	2.9
11	Private study hours: background reading for lectures	5
12	Private study hours: preparation for classes	10
13	Private study hours: preparation for tests	18
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	25
18	Private study hours: preparation for an examination	20
19		
20	Number of private study hours	78 <i>(sum)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	3.1
22	Total study time	150
23	Total ECTS credits for the module <i>(1 ECTS credit = 25-30 hours of study time)</i>	6
24	Number of practice-based hours <i>Total practice-based hours</i>	45
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	1.8

E. READING LIST

References	
Module website	