



## Subject card

Subject name and code	Modern surveying, PG_00040228						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	1	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Geodesy -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Jakub Szulwic					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	15.0	0.0	0.0	45
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study		SUM
	Number of study hours	45	2.0		8.0		55
Subject objectives	Acquainting with modern measurement and calculation techniques used in geodesy (in relation to construction).						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U06] is able to choose proper tools (measuring, analytical or numerical) to solve engineering problems, to acquire, filtrate, proces and analyse data		The student has the ability to interpret and use the results of geodetic measurements in construction. The student has the ability to assess the accuracy of geodetic measurements.		[SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information		
	[K7_W01] has knowledge of higher mathematics, physics and chemistry, which is a base of subjects, such as construction theory and advanced material technology		The student has knowledge of calculation methods related to geodesy in the field of equalization calculations and tasks in the field of surveying. The student has knowledge of optics needed when using geodetic measurement methods.		[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		
Subject contents	<p>Advanced geodetic measurements, monitoring methods with the use of precise geodetic measurements in construction. Local, global, horizontal and vertical reference systems. Coordinates, projections and transformations. Global positional systems (GPS, Glonass, Galileo) architecture, functions, methods of precise measurements, geodetic receivers and their applications in construction. Active geodetic networks, ASG-EUPOS, architecture, network structure, functions, methods, services, data processing. Laser scanning: idea, measurements, instruments, data processing, applications in construction. Integrated geodetic measurements: monitoring structure, building displacement, analyzes, practical solutions. Technical leveling and precision adjustment with the use of optical, code and digital levels. Modern surveying instruments used in construction.</p>						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Assessment of knowledge on the basis of a test.	60.0%	50.0%
	Evaluation of the technical report from field classes.	60.0%	50.0%
Recommended reading	Basic literature	1. Łyszkowicz A., Geodezja, czyli sztuka mierzenia Ziemi, Wydawnictwo UWM w Olsztynie, 2006. 2. Specht C., System GPS, Biblioteka Nawigacji nr 1, Wydawnictwo Bernardinum, Pelplin, 2007. 3. Jagielski A., Podstawy geodezji inżynierskiej - standardy, pomiary realizacyjne, trasy, objętości, Geodpis, 2012	
	Supplementary literature	1. Osada E., Wykłady z geodezji i geoinformatyki, cz. 1. niwelacja, Wydawnictwo UxLAN, Wrocław, 2016. 2. Osada E., Wykłady z geodezji i geoinformatyki, cz. 2. tachimetria, Wydawnictwo UxLAN, Wrocław, 2016. 3. Osada E., Wykłady z geodezji i geoinformatyki, cz. 3. osnovy geodezyjne, Wydawnictwo UxLAN, Wrocław, 2016.	
	eResources addresses	Podstawowe <a href="http://www.igik.edu.pl/pl/Seminaria">http://www.igik.edu.pl/pl/Seminaria</a> - Scientific seminars: 75th anniversary of the Institute of Geodesy and Cartography <a href="https://geoforum.pl/geodezja">https://geoforum.pl/geodezja</a> - Materials published as part of the Geowiedza section in the magazine and industry portal. Uzupełniające Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Field measurements with the use of modern geodetic instruments. Engineering studies and 3D modeling. Field presentation of equipment or technology (e.g. going to a construction site to learn about the work of surveyors).		
Work placement	Not applicable		

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