GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Geomatics, PG_00061770		
Field of study	Geodesy and Cartography		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department Of Geodesy -> Faculty Of Civil And Environmental Engineering -> Wydziały Politechniki Gdańskiej		
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	0.0	15.0	15.0	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	6.0	24.0	75

Subject objectives

The student understands the basics and has the ability to apply the principles of analytical description of the Earth in various areas of geodesy and cartography. The student uses spatial reference systems, geodetic coordinate systems, types of maps used in geodesy and cartography and related fields, taking into account the current legal status. The student becomes familiar with modern methods of surveying, satellite / aerial imaging and GNSS positioning.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U06] can solve geodetic tasks and select measurement methods for typical engineering tasks including the curvature of the Earth and the impact of gravity	The student can choose the measuring equipment depending on the task. Understands the effects of measurement errors depending on the equipment and type of measurement. Student understands the influence of Earth's curvature and distinguishes between normal and ellipsoidal height systems.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
[K6_W05] knows and understands the principles in the field of geomatics, mathematical and thematical cartography, including reference systems and coordinate frames associated with cartographic elaborations, and has knowledge about establishing and modernizing geodetic networks, taking into account the current legal status	The student knows and defines reference systems, coordinate systems (in force in the Republic of Poland and in the European Union), types of maps used in geodesy and cartography and related fields. The student understands the basics of applying the principles of analytical description of the Earth in various areas of geodesy and cartography. The student knows the current legal status in the field of Geodetic and Cartographic Law.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation

<table>
<tr><td>Subject contents</td><td>Modern measuring technologies in geodesy and cartography - a review of solutions - 3 hours.Geodetic and cartographic systems - 6 hours.Foucault's pendulum - operating principle, connection with the Earth's rotation; a look in the context of the introduction to geodetic gravimetry 3 hours.Earth as a measuring surface: introduction to physical geodesy, cartographic mapping, the concept of measurement accuracy, methods of geodetic measurements - 3 hours.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Assessment of the practical task carried out in the field.</td><td>50.0%</td><td>25.0%</td></tr>
<tr><td>Assessment of the presentation in the field of measurement methods.</td><td>50.0%</td><td>25.0%</td></tr>
<tr><td>Assessment of factual knowledge obtained during lectures (test).</td><td>60.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Piotr Banasik, Piotr Cichociński, Józef Czaja, Władysław Góral, Krystian Kozioł, Robert Krzyżek, Jacek Kudrys, Marcin Ligas, Bogdan Skorupa. Podstawy geomatyki. Wydawnictwo AGH, 2011. ISBN: 978-83-7464-320-7
2. Stefan Przewłocki. Geomatyka. Wydawnictwo PWN, 2019. ISBN 9788301155292</td></tr>
<tr><td>Supplementary literature</td><td>Current press materials and articles indexed in journal databases (Web of Science, Scopus or Google Scholar):

https://scholar.google.pl/schhp?hl=pl

http://www.webofknowledge.com/ and https://www.scopus.com/ - access via https://pg.edu.pl/biblioteka-pg/alfabetycznie

and

https://geoforum.pl/geodezja/wprowadzenie

https://geoforum.pl/geodezja/systemy-uklady

https://geoforum.pl/geodezja/transformacja

https://geoforum.pl/geodezja/grawimetria</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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Example issues/ example questions/ tasks being completed	I: Please provide definitions: quasi geoid, orthodrome, ellipsoidal height. Please compare the geodetic coordinate systems: 1965 and PL-2000. Please characterize the azimuth mapping and provide the shape of the meridians and parallels grid for one example (please name the example, assigning to the mapping type). Please describe mapping distortions in the PL-2000 system.What is standardization in geodesy? Please provide examples of at least five standards used in geodesy. II Please provide definitions: geoid, loksodroma, normal height. Please compare the geodetic coordinate systems: 1942 and PL-2000. Please characterize the cylindrical projection and give the shape of the meridians and parallels grid for one example (please name the example, assigning to the projection type). Please describe the mapping distortions in 1965 (for zones 1-4). What are the reasons for using normalization in geodesy? Please provide examples of at least five standards used in geodesy.
Work placement	Not applicable

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