

## GDAŃSK UNIVERSITY

## Subject card

Subject name and code	Geodesy and geodetic astronomy, PG_00044833							
Field of study	Geodesy and Cartography							
Date of commencement of studies	October 2024		Academic year of realisation of subject			2026/2027		
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	3		Language of instruction			Polish		
Semester of study	5		ECTS credits			2.0		
Learning profile	general academic profile		Assessment form			assessment		
Conducting unit	Department of Geode	Department of Geodesy -> Faculty of Civil and Environmental Engineering						
Name and surname	Subject supervisor							
of lecturer (lecturers)	Teachers							
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM
of instruction	Number of study hours	15.0	15.0	0.0	0.0		0.0	30
	E-learning hours inclu	ıded: 0.0			-			
Learning activity and number of study hours	Learning activity	Participation in classes includ plan	n didactic ed in study	Participation in consultation hours		Self-study		SUM
	Number of study hours	30		6.0		14.0		50
Subject objectives	After the course, the student has the knowledge and abilities to solve geodetic problems on the sphere, ellipsoid with the use of novel technology and measurement systems. Student acquainted the methodology of the Earth shape estimation using gravimetric methods knows the influence of the gravitational field on the geodetic measurements and knows the different height system.							
Learning outcomes	Course outcome Subject outcome Me				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		Can use knowledge from the field of mathematics and phisicks in the higher geodesy.					
	[K6_W06] has a well knowledge and unde geodesy concepts in main methods of obta about space togather surveying and compu- methods, which from are compatible with t legal status and from hand refer to measur the plane and cover in modern geodetic inst taking into account th of the Earth and the in gravity on the maner measurements and r	-grounded rstands cluding the aining data r with the utional the one hand he current the other ements on the use of ruments, with he curvature mpact of of esults	rounded tands uding the ning data with the onal he one hand e current he ofter ments on e use of uments, with sults					
Subject contents Prerequisites	Spherical urgonometric inte, properties of a spherical triangle, sinus theorem, cosine theorem for side and for angles, tangents theorem. Brod formulas, Neper analogies. Spherical excess. Field of the spherical triangle. Introduction to higher geodesy: division of geodesy, the shape of the Earth, reference surfaces, geodetic networks. Flattered rotational ellipsoid as a reference surface: elementary relationships between ellipsoid parameters, geodetic coordinates system, normal sections of the ellipsoid and its curvatures, geocentric latitude, reduced latitude, parametric equation of the ellipsoid, geodetic line on the surface of the rotational ellipsoid. Translation of geographical coordinates on the surface of the rotational ellipsoid. Introduction to physical geodesy: gravity force, level surfaces, plumb lines, height. Reference system, coordinate frames used in the geodesy—definitions and mutual relations. High school level.							
and co-requisites								

Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade			
and criteria		100.0%	100.0%			
Recommended reading	Basic literature	Barlik M., Pachuta A. Pruszynśka-Wojciechowska M.: Cwiczenia z geodezji fizycznej i grawimetrii geodezyjnej; Wydawnictwa Politechniki Warszawskiej, Warszawa 1992; Barlik M.: Pomiary grawimetryczne w geodezji; WPW, Warszawa 1996; Barlik M.: Wste p do teorii figury Ziemi; WPW, Warszawa 1995; Barlik M., Pachuta A.: Geodezja fizyczna i grawimetria geodezyjna; Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2007; Czarnecki K.: Geodezja wspołczesna w zarysie; Wiedza i Z ycie Warszawa 1996; Hlibowicki R. i inni: Geodezja Wyz sza i Astronomia Geodezyjna; PWN, Warszawa 1981;				
	Supplementary literature	The current article in higher geodesy from polish and international journals. For exemple: Journal of Geodesy; Marine Geophysical Research; Journal of Geodynamics; Journal of the Geodetic Society of Japan				
	eResources addresses	Adresy na platformie eNauczanie:				
Example issues/ example questions/ tasks being completed	What is the subject of higher geodesy? Basic properties of the spherical triangle. Scope of application for spherical trigonometry equations. Give the definition and characterise basic reference surfaces in geodesy. Basic parameters and quantities characterising the flattered rotational ellipsoid. Application of the Clairaut, Euler and Meusnier formulas in the geodetic calculation. Geodetic line. Clark's algorithm. Principles of the Earth shape estimation using gravimetric methods. The influence of the gravitational field on the geodetic measurements.					
Work placement	Not applicable					

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