University of Gdańsk

Subject card

Subject name and code	Geodesy and Cartography - lecture, PG_00201087						
Field of study	Marine Hydrography						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
Education level	Bachelor's studies		Subject group	Obligatory subject group 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	1		ECTS credits	1.0			
Learning profile	practical		Assessment form	credit			
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		mgr inż. Ireneusz Bojarowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	25.0	0.0	0.0	0.0	0.0	25
	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	25		1.0		4.0	30
Subject objectives	To impart knowledge of the fundamentals of geodesy and cartography, issues in higher geodesy and mathematical cartography, understanding of which is necessary for creation of reference systems and coordinate systems. To be introduced to principles of making geodetic measurements necessary for determining coordinates of points on different surfaces and reference systems. To master knowledge related to processing of survey data and elements of alignment calculus. Familiarisation with preparation of a numerical map and principles of surveying measurements carried out during hydrographic works.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[HML3-U14] is able to use the applicable terminology in presenting and discussing problems related to the field of study	is able to use knowledge of the shape and dimensions of the Earth and reference surfaces in solving geodetic problems; s able to transform (convert) coordinate systems in geodesy; is able to apply appropriate measuring procedures and use geodetic instruments and apparatus; is able to produce a correctly constructed base map	[SU4] test/exam - oral or written
[HML3-U15] is able to communicate using a variety of techniques, including non-verbal and different technical means in the professional environment and in other environments	is able to skilfully convey geographical information in the form of a map	[SU4] test/exam - oral or written
[HML3-W05] knows and understands, at an advanced level, map construction and its symbolism	knows and understands at an advanced level the issues involved in determining the shape of the Earth; knows and understands at an advanced level the theory and types of reference systems and coordinate systems; knows and understands at an advanced level the basic principles of geodetic surveying; knows and understands at an advanced level the theory of cartographic projections and map construction and symbology	[SW4] test/exam - oral or written

Subject contents

Lectures: General knowledge of geodesy. Fundamentals of higher geodesy. Gravimetry.Geophysics. GRS-80 ellipsoid.Sphere, ellipsoid, plane. Reference systems and coordinate systems. Altimetric systems. Transformations. Reference systems in force in Poland. Principles of geodetic measurements. Horizontal measurements. Situational geodetic grid. Use of GPS in geodesy. Altimetric systems. Curvature of the Earth and refraction. Traditional and computerised mapping methods. Overview of the latest technologies and solutions in geodetic surveying and compilation. Realisation surveys. Deformation determinations of hydraulic structures. Mapping in geodesy. Spatial information systems. Geodetic data resources. Introduction to cartography. Fundamentals of cartographic projection theory. Mathematical cartography. Distortions in cartographic projections. Selection of cartographic mappings.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
colloquium	51.0%	100.0%

Recommended reading

Basic literature	KADAJ R.: Wykłady z geodezji-zbiór materiałów wizualnych wersja 015/20.02.2017. (in Polish) OSADA E.: Geodezja i geoinformatyka, Geodezyjne pomiary szczegółowe, Wydanie 2, UxLAN, Wrocław 2014. (in Polish) OSADA E.: Geodezja i geoinformatyka, Geodezyjne układy odniesienia, Wydanie 3, UxLAN, Wrocław 2016 (in Polish) PRZEWSŁOCKI S.: Geomatyka. Wydawnictwo naukowe PWN, 2008. (in Polish)
Supplementary literature	JAGIELSKI A.: Geodezja I. Wydawnictwo Geodpis, Kraków 2005. (in Polish) JAGIELSKI A.: Geodezja II. Wydawnictwo Geodpis, Kraków 2005. (in Polish) SZPUNAR W.: Podstawy Geodezji Wyższej. PPWK Warszawa 1982. (in Polish) SKÓRCZYŃSKI A.: Podstawy obliczeń geodezyjnych. PPWK, Warszawa 1983. (in Polish) CZARNECKI K.: Geodezja współczesna w zarysie, Wydawnictwo Gall, Katowice 2010. (in Polish)
eResources addresses	

Example issues/ example questions/ tasks being completed

Geophysics. Gravimetry. Basics of higher geodesy (plane, sphere, ellipsoid and geoid). Systems and reference frames. Transformations. Equalization account and surveying calculations. Cartographic projections. Geodetic matrix. Distance measurement. Angle measurement. Leveling. Modern instruments and measurement techniques. The use of GPS in geodesy. Creating maps in geodesy. Implementation tasks. Determining the displacements of objects.

Work placement

Not applicable