



Course title: GEODESY (SURVEYING) WITH GEOMATICS (autumn semester)

ECTS credit allocation (and other scores): 5

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 30 hours of classes and 30 hours of lectures

Course coordinator/ Department and e-mail: Adam Duskocz, Department of Geodesy, adam.duskocz@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Introductory topics of the classes. Angle measurement with micrometer theodolite and electronic tachometer. Reduction of directions (angles) measured eccentrically to the centers of geodetic marks. Total station survey in the local coordinate system. Polar measurement using reflector and reflectorless mode. Transmission of surveyed data and elaboration of results in calculation's software. Georeferencing of the raster map by affine transformation and acquisition of geo-data by vectorization. Helmert's transformation of a set of geo-data determined in the local coordinate system to the national system PL-2000. Introduction geo-data to the relational-object database. Calculation of elementary intersections. Designing elementary intersections with use of the manual-graphic method. Transpose of coordinates of the home point and rigorous adjustment of observations and assessment of the accuracy of the transposed point.

LECTURES: Introductory topics of the lectures. National spatial reference system and PZGiK system in Poland. Georeferencing of the raster map by affine transformation and acquisition of geo-data by vectorization. Introduction geo-data to the relational-object database. Classification and specifications for horizontal control survey. Reduction of directions (angles) measured eccentrically to the centers of geodetic marks. Total station survey in the local coordinate system. Helmert's transformation of a set of geo-data determined in the local coordinate system to the national system PL-2000. Calculation of elementary intersections. Designing elementary intersections with the use of manual-graphic method. Transpose of coordinates of the home point and rigorous adjustment of observations and assessment of the accuracy of the transposed point. Classification and specifications for vertical control survey. Trigonometric leveling.

Learning purpose: Ability to design detailed control network and realization of measurements and processing of results along with the preparation of a technical report. Competence in the systematics of state control networks and their accuracy analysis as well as effective use of the national spatial reference system. Skills in the topic of transformation of coordinates and solving intersections.

On completion of the study programme the graduate will gain:

Knowledge: Knowledge of coordinate systems used in surveying and instruments and their use as well as in measurement techniques. Classification of horizontal and vertical control network, detailed and survey network and realization of topographic survey. Data evaluation and their accuracy estimation, as well as automation of measurements and compilation of digital and analogue maps.

Skills: Skills to design detailed control network and realization of levelling and topographic survey. Use of electronic and classical instruments in measurements. Data evaluation and compilation of maps.



Social Competencies: Competencies to interact and work in a team, assuming different roles and indicate accordingly priorities for carrying out the task set out and think and act rationally.

Basic literature:

LITERATURE IN POLISH:

LAZZARINI T. (red.), Geodezja. Geodezyjna Osnowa Szczegółowa, PPWK, 1992. SKÓRCZYŃSKI A.M., Niwelacja trygonometryczna w pomiarach szczegółowych, Wydawnictwo PW, 2000. SKÓRCZYŃSKI A.M., Poligonizacja, Wydawnictwo PW, 2000. SKÓRCZYŃSKI A.M., Lokalna triangulacja i trilateracja, Wydawnictwo PW, 2004. JAGIELSKI A., Geodezja II, P.W. STABIL., 2003. JAGIELSKI A., Przewodnik do ćwiczeń z geodezji II, GEODPIS, 2006. LAMPARSKI J., ŚWIĄTEK K., GPS w praktyce geodezyjnej, GALL, 2007. OSADA E., Osnowy geodezyjne, UxLAN Wrocław, 2014. OSADA E., Geodezyjne układy odniesienia, UxLAN Wrocław, 2014. OSADA E., Geodezyjne pomiary szczegółowe, UxLAN Wrocław, 2014. GAŹDZICKI J. (red.), Leksykon geomatyczny, <http://www.ptip.org.pl>, 2002. GUGiK, Obowiązujące w dziedzinie geodezji i kartografii akty prawne oraz standardy techniczne, <http://isap.sejm.gov.pl>, 1989.

Supplementary literature:

LITERATURE IN ENGLISH (for example):

Charles D. Ghilani and Paul R. Wolf, Elementary Surveying: An Introduction to Geomatics, 15th Edition, 2017.

Jack C. McCormac, Surveying, 6th Edition, 2012.

Frederic P. Miller, Agnes F. Vandome and John McBrewster, Geomatics, 2010.

Barry F. Kavanagh, Surveying: Principles and Applications, 8th Edition, 2008.

The allocated number of ECTS points consists of: 5 (150 hours)

Contact hours with an academic teacher: 63 hours.

Student's independent work: 87 hours.