



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of surveying [S1BZ1E>PGD]

Course

Field of study

Sustainable Building Engineering

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

English

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

3,00

Coordinators

dr inż. Artur Plichta

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Lecturers

Prerequisites

Basic knowledge on mathematics, geometry, trigonometry

Course objective

The objective of this course is to get knowledge on modeling the local Earth surface and objects fixed on it on the base of direct or non-direct measurements, and presentation them in 2D and 3D form

Course-related learning outcomes

Knowledge:

Knowing rules and legal requirements on preparing great-scale maps, achievement of basic geometric and cartographic knowledge about preparing and updating maps in sustainable building engineering

Knowing geodetic methods of measurement, computation and interpretation of planar and vertical (height) data

Knowing rules, legal requirements and methods of surveying works at construction site

Skills:

Student has skills to read information from maps about objects presented on "basic map" and "map for

design purposes"; and to update the basic map (digital methods)

Is able to do basic geodetic measurements in the field of land surveying - planar, vertical and 3D methods

Is able to do surveying works on construction site, like setting-out, as-built surveys, and their elaborations, as well as inventory and diagnostic surveys of buildings and structures.

Social competences:

Students are able to obtain information from geodetic documentation and databases about terrain objects

Are able to broaden knowledge from literature and legal acts

Are able to do teamwork in the field of surveying and mapping

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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1. Do interpretation of geodetic documentation (several pages of description) concerning surveying or cartographic works
2. Perform a test covering the curriculum content of the basics of geodesy (required for lectures)
3. Do basic measurements, calculations, and cartographic works, and present results in the form of "Engineering documentation" (required for laboratories)

Programme content

Legislation basis in geodesy and cartography. Theoretical and practical foundations of situational and height measurements in geodesy. Basics of using surveying instruments. Basics of geodetic calculations. Principles of creating base map databases.

Course topics

Basics of cartographic projections (Gauss-Kruger projection) and basic principles of creating large-scale maps - basic map. The content of geodetic databases, in particular the land and building records database and the geodetic records of the land infrastructure network. Construction of a theodolite and total station, principle of measurements with geodetic tape and electronic rangefinder and their use in situational (flat) geodetic measurement methods (angular and linear). Coordinate geometry (Cartesian coordinates X,Y). The principle of operation of a level and a total station for height measurements (situational-altitude measurements). Calculating height in a three-dimensional coordinate system. Tachymetric measurements in a three-dimensional coordinate system. General principles of surveying works on the construction site - marking out the building and as-built measurements and updating the base map.

Teaching methods

1. Lectures; Self-preparation of a technical text
2. Training on the use of surveying equipment (laboratories)
3. Summer field practice

Bibliography

Basic

John Uren, Bill Price, Surveying for Engineers (5th Edition), ISBN 978-0230221574

Barry Kavanagh, Tom Mastin, Surveying: Principles and Applications (9th Edition). ISBN 978-0137009404

Łyszkowicz A., Łyszkowicz S., Surveying. Wyd. Politechniki Warszawskiej, ISBN 978-83-7207-876-6

Additional

Barry Kavanagh, Dianne Slattery Surveying: with construction applications (7th Edition). ISBN 978-0132766982

Hycner R., Dobrowolska-Wesołowska M., Geodesy, Surveying and Professional Ethics, Wyd. Gall, 2008

Wyczałek I., Mróczyńska M., Plichta A., Pomiary sytuacyjne w zastosowaniach inżynierskich. Wyd. PP, 2019

Wyczałek I., Plichta A., Mapa w zastosowaniach inżynierskich. Wyd. PP, 2020

Wyczałek I., Plichta A., Pomiary wysokościowe i sytuacyjno-wysokościowe w praktyce inżynierskiej, Wydawnictwo Politechniki Poznańskiej, 2022

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	45	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00