



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of surveying [S1Bud1>PGD]

Course

Field of study

Civil Engineering

Year/Semester

1/2

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

Number of credit points

3,00

Coordinators

dr inż. Artur Plichta

artur.plichta@put.poznan.pl

Lecturers

Prerequisites

KNOWLEDGE: Student beginning this course should have basic knowledge on analytical geometry and trigonometry, and should know basic mathematical analysis methods. SKILLS: Student should have an ability to solve basic mathematical tasks from geometry and trigonometry. COMPETENCIES: Student should be able to work in a team.

Course objective

The objective of this course is to acquire knowledge on trends in large scale geocartographic studies and the basic geodesic work used in the construction industry, including: - Mastering the techniques of surveying in the field to separate the execution of measurement of lengths, angles, the designation of the differences of method of geometric levelling and trigonometric, calculation of the coordinates and the surface. - Skills of formulating and solving simple tasks of surveying. The ability to determine the impact of errors in measurements and the accuracy of the measurements. - Surveying literacy materials and documentation prepared in the traditional and digital.

Course-related learning outcomes

KNOWLEDGE: Student:

1. Knows 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;
2. Knows geodetic methods of measurement, computation and interpretation of planar and vertical (height) data;
3. knows rules, legal requirements and methods of surveying works at construction site.

SKILLS: Student:

1. 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);
2. Is able to do basic geodetic measurements in the field of land surveying - planar, vertical and 3D methods;
3. 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: Student:

1. Is responsible for credibility of obtained results of own work and their interpretation.
2. Understands need for team work, is responsible for own safety and safety of a team.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Knowledge from lectures is verified by two 40-minute colloquiums done after the 7th and the 15th lecture. Each colloquium has 15-20 questions (tes). The passing threshold is 50% of points. Topics for the colloquium, on which the colloquium questions are based, will be send to students using PUT email system. Skills acquired during laboratory classes are verifies by:

- a) activity in classes,
 - b) active engagement in practical classes,
 - c) execution of measure-calculate assignments - successively as the laboraory classes go.
- Passing threshold is 50% of points.

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

Lecture - multimedia presentation, illustrated with examples drawn on blackboard.
Laboratory - training on the use of surveying equipment - practical experience

Bibliography

Basic:

1. Uren J., Price B.: Surveying for Engineers (5th Edition), ISBN 978-0230221574
2. Kavanagh B., Mastin T.: Surveying: Principles and Applications (9th Edition). ISBN 978-0137009404
3. Łyszkowicz A., Łyszkowicz S.: Surveying. Wyd. Politechniki Warszawskiej, ISBN 978-83-7207-876-6

Additional:

Kavanagh B., Slattery D.: 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	90	3,00
Classes requiring direct contact with the teacher	45	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	1,50