



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of surveying

### Course

Field of study

Sustainable building engineering - SBE

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

english

Requirements

compulsory

### Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

dr inż. Artur Plichta

Responsible for the course/lecturer:

### 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:

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

Block 1. Basics of map projections and basic rules of large-scale mapping. Content of geodetic databases, especially land and building records and geodetic register of utility networks

Block 2. Theodolite, tape and EDM and their use in horizontal (planar) methods (angular and linear) methods of geodetic measurements; coordinate geometry (COGO)

Block 3. Level and Total Station in the use for vertical (height) surveys of terrain and constructions

Block 4. 3D measurements using TS and GNSS and processing of collected data for 3D modeling

Block 5. Geodetic works on building site - setting out, as-build measurements and updating the basic map; diagnostic surveys, geodetic monitoring of the health of the structures.

### 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

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,0
Classes requiring direct contact with the teacher	45	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	45	1,5

<sup>1</sup> delete or add other activities as appropriate