



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Elective I - Surveying in Civil Engineering

### Course

Field of study

Civil Engineering

Area of study (specialization)

Road, Bridge and Railway Engineering

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

1 / 2

Profile of study

general academic

Course offered in

Polish

Requirements

elective

### Number of hours

Lecture

10

Laboratory classes

10

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr hab. inż. Ireneusz Wyczalek, prof. PP

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Responsible for the course/lecturer:

### Prerequisites

Knowledge on the basics of geodesy, cartography, geometry and the basics of mathematical statistics

Ability to perform measurements and develop results in the field of leveling and tacheometry

Ability to work with a large-scale map (the Basic map)

### Course objective

The aim of the classes is to familiarize the student with geodetic and cartographic materials as well as geodetic works applicable in construction. The student learns the specifics of these works, modern measuring solutions and equipment used for their implementation, and independently performs selected works in order to acquire practical skills.

### Course-related learning outcomes

Knowledge



1. Classic surveying methods and modern instruments used for their implementation, together with the assessment of the accuracy of the measurement results, and the principles of their development, []
2. The obligatory system of spatial references and the mathematical and technical basis for the elaboration of a large-scale map, the use of computer technology for this purpose, as well as the features of land and building records (EGiB) and GESUT databases, and the principles of creating a map for design purposes, []
3. The specificity, scope and surveying methods used in the setting-out, inventory (as-built), diagnostic and control measurements applicable in the construction investment process. []

#### Skills

1. Surveying elaboration of structural design in order to prepare the data for staking out and activities to transfer the project to the field
2. Performing the required diagnostic measurements and preparing the report with the accuracy assessment and descriptive-graphical presentation of results
3. Performing the measurements in the scope of monitoring of the geometric state of structures or objects with the elaboration of observations as well as the accuracy assessment and descriptive-graphical presentation of results

#### Social competences

1. Awareness of the need to constantly update and supplement knowledge and skills. []
2. Responsible participation in teamwork []

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

##### LECTURES:

Problem test in the range of the use of measurement methods in engineering issues, as well as the use of geodetic and cartographic materials used in the investment process - 1 hour. at the end of the semester (max. 5 points = lecture grade),

##### LABORATORIES:

Development of four reports based on the measurements made during the exercises and their defense - settlement at the end of the semester (5 points = exercise grade).

The minimum number of points to pass - 3 points (> 2.75)

#### Programme content

1. Legal basis for geodetic and cartographic materials, information databases and measurement activities applicable in the investment process;



2. Theoretical basis and the latest technical solutions in the field of measurements and the development of observational data;
3. The course of implementation measurements: network, staking out methods and as-built inventory of completed buildings and technical infrastructure;
4. Theoretical and technical basics as well as the scope of diagnostic and control measurements;
5. Reasons, scope and course of measurements of displacements and deformations, calculations, geodetic interpretation of results. Methods of horizontal and vertical (height) measurements. Using geodetic instruments. Interpretation, accuracy assessment and processing of measurement data. Geodetic techniques of satellite navigation and laser scanning.

#### LABORATORY TOPICS

- 1) Selected tasks in the field of height measurements
- 2) Implementation network, development of the implementation plan, staking out using the tacheometric and GNSS method
- 3) Diagnostic measurement - wall flatness
- 4) Measurement of the settlement of the building object

#### Teaching methods

Lecture with visual presentation (or film), direct work with surveying instruments; calculations, presentation and analysis of measurement results

#### Bibliography

##### Basic

1. Pomiary inżynierskie, Jasiak A., Lelonkiewicz H., Wójcik M., Wyczałek I., Wyd. PP, Poznań, 1999
2. Engineering Surveying, Schofield W., BreachM., Routledge, London-New York 2011 (Sixth edition).
3. Construction Measurements, Barry B. A., Wiley Interscience, New York, 1988

##### Additional

1. Geodezyjne pomiary inżynierskie. Wyczałek I., Wyczałek E., Wyd. AR w Poznaniu, 2005
2. Geodezja inżyniersko-budowlana. Wolski B., Toś C., Wydawnictwa Politechniki Krakowskiej 2005.



### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	20	1,0

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