# POZNAN UNIVERSITY OF TECHNOLOGY



EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

## **COURSE DESCRIPTION CARD - SYLLABUS**

Course name Engineering surveying [S2Bud1E>PI]

Course			
Field of study Civil Engineering		Year/Semester 1/2	
Area of study (specialization) Construction Engineering and Mar	nagement	Profile of study general academic	;
Level of study second-cycle		Course offered in English	
Form of study full-time		Requirements compulsory	
Number of hours			
Lecture 15	Laboratory classe 15	es	Other 0
Tutorials 0	Projects/seminars 0	5	
Number of credit points 2,00			
<b>Coordinators</b> dr inż. Joanna Papis joanna.papis@put.poznan.pl		Lecturers	

#### **Prerequisites**

KNOWLEDGE: Student beginning this course should know the basics of geodesy, cartography, geometry and the basics of mathematical statistics. SKILLS: Student should be able to: - perform measurements and develop results in the field of levelling and tacheometry; - 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. Student knows classical measurement methods and modern instruments used for their implementation along with the assessment of the accuracy of the measurement results and the rules for their development; 2. Student knows the binding system of spatial references and the mathematical and technical basis for the implementation of a large-scale map, the use of computer technology for this purpose, as well as the

features of land and building records databases and GESUT, and the principles of creating maps for design purposes;

3. Student knows the specificity, scope and measurement methods used in the implementation, inventory, diagnostic and control works in the construction investment process. SKILLS:

1. Student can elaborate a construction project to prepare data for locating that construction, including an assessment of the accuracy of the measurement results and principles of their elaboration;

2. Student can undertake required diagnostic measurements including an elaboration of the observations, precision evaluation and result presentation using verbal and graphic methods;

3. Student can do measurements within a monitoring of a geometric state of a construction including an elaboration of the observations, precision evaluation and result presentation using verbal and graphic methods;

SOCIAL COMPETENCIES:

Student is aware of the need to constantly update and supplement knowledge and skills.

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

Learning outcomes presented above are verified as follows:

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**

The module's programme covers:

- theoretical and legal foundations in engineering surveying;
- construction, diagnostic and control surveys;
- the latest technical solutions in construction surveying.

#### **Course topics**

LECTURE:

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.

6.Geodetic techniques of satellite navigation and laser scanning.

LABORATORY:

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**

Information lecture with visual presentation (or film), direct work with surveying instruments (laboratory method and terrain measurements method); calculations, presentation and analysis of measurement results

## Bibliography

Basic

1. Engineering Surveying, Schofield W., BreachM., Routledge, London-New York 2011 (Sixth edition).

- 2. Construction Measurements, Barry B. A., Wiley Interscience, New York, 1988
- Additional
- 1. Geodezyjne pomiary inżynieryjne. Wyczałek I., Wyczałek E., Wyd. AR w Poznaniu, 2005
- 2. Geodezja inżynieryjno-budowlana. Wolski B., Toś C., Wydawnictwa Politechniki Krakowskiej 2005.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00