STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Engineering Measurement		**1010102121010123739**
Field of study	Profile of study (general academic, practical)	Year /Semester
Structural Engineering Second-cycle Studies	**general academic**	**1 / 2**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**English**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
Second-cycle studies	**full-time**	
No. of hours		No. of credits
Lecture: **15** Classes: **-** Laboratory: **15** Project/seminars: **-**		**2**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
major	**from field**	
Education areas and fields of science and art		ECTS distribution (number and %)
technical sciences		**2 100%**
Technical sciences		**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basics of surveying, analytical geometry, mathematical foundations of statistics
2	**Skills**	Leveling, COGO calculations
3	**Social competencies**	The need to constantly update and supplement knowledge and skills.

Assumptions and objectives of the course:

The course aims to familiarize students with geodetic and cartographic materials and the surveys being in use in construction industry. Student learns the specificity of these works, modern measurement solutions and equipment used for their implementation, and independently performs selected works in order to acquire practical skills

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. traditional and modern surveying methods, instruments used to implement them together with an assessment of accuracy of measurement results and the principles of their development, - [- K_W12]

2. the existing spatial reference system and the mathematical and technical basis for the implementation of large-scale maps, the use of computer technology for this purpose, basic map features, the land and buildings records, underground units as well as maps for planning purposes, - [- K_W17, K_W12]

3. specificity, scope and methods of surveys being in use in the construction works, as well as inventory, diagnostic and control surveys force in the construction investment process. - [- K_W12, K_W08]

Skills:

1. geodetic development of a construction design in order to prepare the data to stake, and the activities aimed at launching the project in the site, - [- K_U09, K_U16]

2. performing selected diagnostic measurements with the development of observation and assessment of accuracy and also descriptive and graphical presentation results, - [- K_U09, K_U07]

3. monitoring of the geometrical structures or constructions, the development of observations and assessment of accuracy and presentation of descriptive and graphical results. - [- K_U16, K_U07]

Social competencies:

1. The awareness of the need to constantly update and supplement knowledge and skills. - [- K_K01, K_K02]

Assessment methods of study outcomes

The problem test for the use of measurement methods in engineering and geodetic applications, as well as cartographic data used in the investment process - 1 hr. at the end of the semester (max. 6 points),

Development of three elaborations based on measurements made during exercise and defend - the settlement at the end of the semester (six points).

Grading Scale:

Number of evaluation points

>11 ? very good (A)

>10 ? good plus (B)

> 9 ? good (C)

> 8 ? satisfactory plus (D)

> 7 ? satisfactory (E)

under 7 ? insufficient (F)

Course description

1. The legal basis of geodetic and cartographic data, information bases and measuring procedures in force in the investment process;
2. Theoretical basis and the latest technology in the performance measurement and development of observational data;
3. Scheduling of surveys ? frames, methods of stakeout and as-built inventories of buildings and technical infrastructure;
4. The theoretical and technical basics and the scope of diagnostic and control measurements;
5. The causes, extent and course of the displacement and deformation measurements, calculations, surveying the interpretation of results.

Basic bibliography:

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

Additional bibliography:

1. Surveying for Engineers, J. Uren and B. Price, Pangrave Macmillan, London 2010 (5th edition)
2. Construction Measurements, Barry B. A., Wiley Interscience, New York, 1988
3. Geodezyjne pomiary inżynieryjne. Wyczałek I., Wyczałek E., Wydawn. Akademii Rolniczej w Poznaniu, 2005

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Participation in laboratories	15
3. Preparing for laboratories	5
4. Complete (at home) reports laboratory exercise	5
5. Participation in consultations related to the implementation of laboratory exercises	1
6. Preparing for inclusion in the final of the exercises	2
7. Preparing to pass the lectures and the presence of the exam	7

Student's workload

Source of workload	hours	ECTS
Total workload	50	2
Contact hours	35	2
Practical activities	30	1