

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Engineering Measurement		Code 1010112121010123739
Field of study Civil Engineering	Profile of study (general academic, practical) general academic	Year /Semester 1 / 2
Elective path/specialty -	Subject offered in: English	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: - Laboratory: 15 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) major		(university-wide, from another field) from field
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr hab. inż. Ireneusz Wyczalek email: Ireneusz.Wyczalek@put.poznan.pl tel. +48 61 6652420 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań		
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		
<p>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),</p> <p>Development of three elaborations based on measurements made during exercise and defend - the settlement at the end of the semester (six points).</p> <p>Grading Scale:</p> <p>Number of evaluation points</p> <p>>11 ? very good (A)</p> <p>>10 ? good plus (B)</p> <p>> 9 ? good (C)</p> <p>> 8 ? satisfactory plus (D)</p> <p>> 7 ? satisfactory (E)</p> <p>under 7 ? insufficient (F)</p>		
Course description		
<p>1. The legal basis of geodetic and cartographic data, information bases and measuring procedures in force in the investment process;</p> <p>2. Theoretical basis and the latest technology in the performance measurement and development of observational data;</p> <p>3. Scheduling of surveys ? frames, methods of stakeout and as-built inventories of buildings and technical infrastructure;</p> <p>4. The theoretical and technical basics and the scope of diagnostic and control measurements;</p> <p>5. The causes, extent and course of the displacement and deformation measurements, calculations, surveying the interpretation of results.</p>		
Basic bibliography:		
<p>1. Engineering Surveying, Schofield W., BreachM., Routledge, London-New York 2011 (Sixth edition).</p> <p>2. Pomiary inżynierskie, Jasiak A., Lelonkiewicz H., Wójcik M., Wyczałek I., Wyd. PP, Poznań, 1999</p>		
Additional bibliography:		
<p>1. Surveying for Engineers, J. Uren and B. Price, Pangrave Macmillan, London 2010 (5th edition)</p> <p>2. Construction Measurements, Barry B. A., Wiley Interscience, New York, 1988</p> <p>3. Geodezyjne pomiary inżynierskie. Wyczałek I., Wyczałek E., Wydawn. Akademii Rolniczej w Poznaniu, 2005</p>		
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