

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject EC: Automatics and Measurements in Electrical Power Engineering		Code 1010324361010310022
Field of study Electrical Engineering	Profile of study (general academic, practical) general academic	Year /Semester 3 / 6
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 12 Classes: - Laboratory: 14 Project/seminars: 8		No. of credits 6
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer:		
dr inż. Krzysztof Szubert email: : krzysztof.szubert@put.poznan.pl tel. +48 61 665 2392 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge in the scope of electrical engineering and the work of electric power systems in normal and disturbed states
2	Skills	Ability to understand and to interpret passed on knowledge and to self-study in the domain connected with chosen course of studying
3	Social competencies	Has a consciousness of necessity to widen competences and willingness to work in a team
Assumptions and objectives of the course:		
-To acquaint with basic tasks of electrical power engineering protection and with methods of measuring criterion quantities for the needs of supervision, control and protection of power system		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has basic knowledge in the scope of automatics and automatic control, knows operation criteria and the rules of the chose of electric power engineering protection - [K_W22+++]		
Skills:		
1. Is able to design simple electrical system for various applications, using proper methods, technics and tools - [K_U03+]		
Social competencies:		
1. Is aware of significance of his own work and willingness to acquiesce to principles of working in group and to be responsible for collectively realized task - [K_K03++]		
Assessment methods of study outcomes		
-Lecture evaluation of the knowledge on written (test) exam and oral exam Laboratory pre-classes verifying tests evaluation of reports and discussion about problem matters Project design seminar evaluation of realized project		

Course description		
<p>Electromagnetic compatibility in power engineering. Measurements of the parameters of the elements of the power system. Tasks and selection of voltage and current transformers. Measurement errors, their division specificity and methods of limitation. Interpretation of measurements (including the creation of least error squares). Selection of basic electric power protection elements. Introduction to digital measurements, SOI, NOI, orthogonal filters (their synthesis and features).</p>		
<p>Basic bibliography: 1. Winkler W., Wiszniewski A.: Automatyka zabezpieczeniowa w systemach elektroener-getycznych. Wydanie I, WNT, Warszawa, 1999. Wydanie II, WNT, Warszawa, 2004.</p>		
<p>Additional bibliography: 1. Szafran j., Wiszniewski A., Algorytmy pomiarowe i decyzyjne cyfrowej automatyki elektroenergetycznej, WNT Warszawa, 2001. 2. Wiszniewski A., Przekładniki w elektroenergetyce. Wyd.2, WNT Warszawa 1992r.</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	12	
2. Participation in the consultation regarding the lecture	4	
3. Preparation for laboratory classes	10	
4. Participation in laboratory classes	14	
5. Preparation and implementation of a report on laboratory exercises	10	
6. Participation in the auditorium project classes	8	
7. Consultations on project matters	16	
8. Implementation of the project	15	
9. Preparation for the exam	15	
10. Participation in the exam	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	106	6
Contact hours	56	4
Practical activities	14	1