STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Automatics and Measurements in Electrical Power Engineering**		Code **1010321261010314795**	
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **(brak)**	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) **full-time**		

No. of hours				No. of credits
Lecture: **2** Classes: **-** Laboratory: **2** Project/seminars: **1**				**5**

Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**

Education areas and fields of science and art **technical sciences**	ECTS distribution (number and %**)** **5 100%**

Responsible for subject / lecturer:

dr hab. inż. Kazimierz Musierowicz, prof. nadzw.
email: kazimierz.musierowicz@put.poznan.pl
tel. 61 665 20 40
Wydział Elektryczny
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

-Tasks and functions of measurement-control and protection elements, digital technology. Structure of measurement lines for the needs of measuring, supervision and protection of electric power system, current and voltage measuring transformers, digital filters, basic measuring-decision algorithms

Basic bibliography:

1. Winkler W., Wiszniewski A.: Automatyka zabezpieczeniowa w systemach elektroener-getycznych. Wydanie I, WNT, Warszawa, 1999. Wydanie II, WNT, Warszawa, 2004.

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 Warzsawa 1992r.

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	40

Student's workload

Source of workload	hours	ECTS
Total workload	143	5
Contact hours	92	4
Practical activities	30	1