STUDY MODULE DESCRIPTION FORM

Name of the module/subject	Code
Digital signal processing in electric power engineering	**1010315341010316100**

Field of study	Profile of study (general academic, practical)	Year /Semester
Electrical Engineering	**(brak)**	**2 / 4**

Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Power Networks and Electric Power System	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**part-time**

No. of hours				No. of credits
Lecture: **9** Classes: **-** Laboratory: **9** Project/seminars: **-**				**2**

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

Education areas and fields of science and art	ECTS distribution (number and **%)**

Responsible for subject / lecturer:	Responsible for subject / lecturer:
dr inż. Bogdan Staszak email: bogdan.staszak@put.poznan.pl tel. 61 665 26 35 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań	dr inż. Jacek Handke email: jacek.handke@put.poznan.pl tel. 61 665 25 59 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basics of electric power engineering and automatics of electric power engineering
2	**Skills**	Ability to effective self-studying in the domain connected with chosen course of studying, ability to use of computer simulation to evaluate performance of elements of power system and to interpret the results of this simulation
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 methods of signals conversion and measurement-decision algorithm synthesis in slotted lines of electric power protection authomatics

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

Knowledge:

1. Has a widen knowledge in the scope of advanced numerical methods used to solve complex electric engineering problems - [K_W02+]

2. Has knowledge in the scope of creating optimization and decision algorithms allowing on stable work of electric power system - [K_W17++]

3. Has theoretical and practical knowledge in the scope of sources, effects and methods of reducing influence of disturbances on power network. - [K_W19+++]

Skills:

1. Is able to evaluate and to compare design solution and processes of creation electrical elements and systems considering assigned usable and economic criteria such as electrical parameters, reliability, time-consumption, cost and others - [K_U08++]

2. Is able to plan testing process of complex electrical devices and systems - [K_U10++]

Social competencies:

1. Understand the necessity to pass on information and opinion about electrical engineering achievements and about other aspects of electrical engineer work to community, takes an effort to pass on such information in popularly possible to understand manner, presenting various points of view - [K_K02++]

Assessment methods of study outcomes

-Lecture

Evaluation of the knowledge on written exam (problem character)

Permanent evaluation on every class rewarding for activity and quality of perception

-Laboratory

Pre-classes verifying tests

Rewarding the knowledge necessary for realization of problems connected with laboratory tasks

Evaluation activity and ability in task realization

Course description

-Conversion of analog signals, transient phenomena in current and voltage measuring transformers. Chosen methods of measuring signals analysis and disturbance identification, analog filtering, antialiasing filters. Analog-digital conversion. Digital filtration, synthesis of recursive and non-recursive filters. Measuring algorithms of basic criteria quantities. Logical structures of EAZ system. Students carry out research projects related to the unit's research.

Basic bibliography:

1. Musierowicz K., Staszak B.: Technologie informatyczne w elektroenergetyce, cz.I - przetwarzanie sygnałów, Wyd.PP Poznań, 2010

2. Szafran J., Wiszniewski A.: Algorytmy pomiarowe i decyzyjne cyfrowej automatyki elektroenergetycznej, WNT Warszawa, 2001.

Additional bibliography:

1. Wiszniewski A.: Algorytmy pomiarów cyfrowych w automatyce elektroenergetycznej, WNT Warszawa, 1990.

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	15
2. Participation in tutorials related to lectures	5
3. Preparation to exam	10
4. Participation in examination	2
5. Participation in laboratory exercises	15
6. Preparation to laboratory exercises and participation in tutorials related to laboratory exercises	10

Student's workload

Source of workload	hours	ECTS
Total workload	57	3
Contact hours	37	2
Practical activities	15	1