STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Design of measurement systems in electric power engineering**		Code **1010312331010316093**
Field of study **Electrical Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 3**
Elective path/specialty **High Voltage Engineering**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **-** Classes: **-** Laboratory: **-** Project/seminars: **30**		No. of credits **3**
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** **Technical sciences**		ECTS distribution (number and %) **4 100%** **4 100%**

Responsible for subject / lecturer:

dr inż. Krzysztof Walczak
email: krzysztof.walczak@put.poznan.pl
tel. 61 665 2797
Wydział Elektryczny
ul. Piotrowo 3A 60-965 Poznań

Responsible for subject / lecturer:

dr inż. Wojciech Sikorski
email: wojciech.sikorski@put.poznan.pl
tel. 61 665 2035
Wydział Elektryczny
ul. Piotrowo 3A 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student has basic knowledge of electrical engineering, power engineering and digital metrology of basic physical quantities.
2	**Skills**	Student can use a personal computer in solving engineering tasks. Student is able to present the results of their work. Student is able to work in a team.
3	**Social competencies**	Student understands the importance of teamwork.

Assumptions and objectives of the course:

Understanding the LabVIEW graphical programming environment. Creating applications that support the device and measuring card. Getting to know the basics of creating measurement systems and expert in electrical power systems.

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

Knowledge:

1. Student can design and make the application in LabView environment that allows for the registration and processing of the signals recorded by the measuring systems for monitoring of typical power equipment. - [K_W05++, K_W15+++]
2. Student can design and make simple diagnostic applications in LabView environment for monitoring and analysis of devices operating in the electrical power grid. - [K_W05++, K_W16++]

Skills:

1. Student can design computer applications designed to monitor the work of electrical equipment. - [K_U13+++]
2. Student can propose measurement-diagnostic solutions to increase the reliability of work of electrical equipment. - [K_U18++]

Social competencies:

1. Student can think and act in a creative way to improve reliability of power device work. - [K_K01+++]

Assessment methods of study outcomes

Project exercise:

- continuous evaluation, on each course - rewarding skills gain in the range of use of the principles and methods have met during the course,

- assessment of knowledge and skills related to the implementation of the project, the assessment of project work effects and its presentation.

Course description

Classes include the following topics: introduction to programming in LabVIEW graphical environment, way to prepare an application in a graphical programming environment, operations on arrays, strings, files, the use of structures, graphs, local and global variables, signal processing functions, support for measurement cards and measurement equipment connected by standard interfaces or network, use the advanced features of signal acquisition and processing, the basics of creating complex measurement and expert systems.

Basic bibliography:

1. Tłaczała W.: Środowisko LabVIEW w eksperymencie wspomaganym komputerowo, Wydawnictwo WNT, 2002

2. Świsulski D.: Komputerowa technika pomiarowa Oprogramowanie wirtualnych przyrządów pomiarowych w LabView, Wydawnictwo PAK, Warszawa, 2005.

3. Chruściel M.: LabView w praktyce, Wydawnictwo BTC, 2008.

4. Transformatory w eksploatacji. Praca zbiorowa pod red. J. Subocza, Energo-Complex, 2007.

Additional bibliography:

1. Wells L.: LabVIEW Student Edition User & Guide, Prentice Hall, 1995

Result of average student's workload

Activity	Time (working hours)
1. Participation in project activities	30
2. Consultation	5
3. Preparing for classes	10
4. Implementation of the project	15
5. Preparation of project results presentation	4
6. Presentation of the project results and credit the course	1

Student’s workload

Source of workload	hours	ECTS
Total workload	65	3
Contact hours	36	2
Practical activities	64	3