

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Working Tests of Electric Devices</b>		Code <b>1010311361010316913</b>
Field of study <b>Electrical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 6</b>
Elective path/specialty <b>Distribution Devices and Electrical</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>15</b> Classes: <b>-</b> Laboratory: <b>15</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>2 100%</b> <b>2 100%</b>
<b>Responsible for subject / lecturer:</b>  dr hab. inż. Jerzy Janiszewski email: jerzy.janiszewski@put.poznan.pl tel. 61 665 20 28 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of construction and operation of the electrical devices and systems as well as the measuring equipment and its application.
2	<b>Skills</b>	Ability to use the experimental tools, Ability to acquire information from the field literature, standards, working regulations and other sources as well as the substantial mining of the latter.
3	<b>Social competencies</b>	Understanding of the need for creative and responsible activity
<b>Assumptions and objectives of the course:</b> Getting knowledge of principles and methods of the electric devices and systems parameters? diagnostics.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has ordered knowledge in the scope of working tests of the typical electric devices and systems. - [K_W05++, K_W19+]		
<b>Skills:</b>		
1. Student is able to carry out the diagnostic measurements and to verify the tested object's value/quality. - [K_U14++]		
2. Student is able to carry out tests according to the regulation requirements referring to the safety and working conditions. - [K_U06++, K_U14++]		
<b>Social competencies:</b>		
1. Student understands the need for continuous learning including knowledge about modern diagnostic methods and legal regulations in force. - [K_K01 +]		
2. Has understanding of need for interdisciplinary specialists? cooperation and has understanding of the need for device condition tests to provide its safe work. - [K_K06+]		
<b>Assessment methods of study outcomes</b>		

Lecture: Assessment of the knowledge and skills during the problem-solving type examination, oral or written, on-line assessment at each class ( bonus for activity and perception quality).

Lab class: test and priority/bonus for the knowledge necessary to accomplish the problems posed within the indicated lab-task area, assessment of the knowledge and skills related to the lab task accomplishment, assessment of the lab-task accomplishment report.

Reaching extra points for activity in discussions, especially for:

- effectiveness of implementation of the knowledge acquired when solving a given problem, ability to cooperate in the team accomplishing in practice a specific task either in lab or within the team-accomplished design, remarks related to the educational materials? enhancement, care and esthetic form of the reports.

**Course description**

1. Regulation and standards requirements referring to the measurements and diagnostic of chosen electric devices and systems.
2. Completion and working tests ? goal and scope of tests: arrangement and safety of the accomplished measurements, time-schedules of tests, qualification requirements concerning the test makers.
3. Electric and non-electric magnitudes measurements, diagnostic instruments and their accuracy, acquisition and reporting of the test results.
4. Diagnostic tests of chosen distribution equipment, overhead lines construction elements, conductors, cables and low voltage installations.
5. Alternative measurement techniques in working tests of the electric power devices.

**Basic bibliography:**

1. Maksymiuk J., Pochanke Z.: Obliczenia i badania diagnostyczne aparatury rozdzielczej, wyd.1, WNT, 2001.
2. Kupras K.: Pomiar w elektroenergetyce ? wytyczne, wyd. SEP, 2007.
3. Laskowski J.: Poradnik elektroenergetyka przemysłowego, COSTW SEP, Warszawa,1998.
4. PEUE, Zeszyt nr 6: Eksploatacja baterii kondensatorów energetycznych do kompensacji mocy biernej, Instytut Energetyki, Dział I, WEMA, 1983.
5. Au A., Maksymiuk J., Podgórski A.: Badania łączników elektroenergetycznych prądu przemiennego, WNT, Warszawa, 1978.
6. Konopacki Z., Gryżewski Zd.: Prace kontrolno-pomiarowe przy urządzeniach elektroenerge-tycznych o napięciu znamionowym do 1 kV, COSTW SEP, Warszawa,1999.

**Additional bibliography:**

1. Poradnik inżyniera elektryka, WNT, 1997.
2. Periodyki: Elektroinstalator, Elektroinfo,
3. Publikacje internetowe.
4. Normy przedmiotowe. (np: PN-IEC 60364-6-61:2000 Instalacje elektryczne w obiektach budowlanych. Sprawdzanie. Sprawdzanie odbiorcze., PN-91/E-06105/02: Wyłączniki wysokonapięciowe prądu przemiennego. Badania typu.)

**Result of average student's workload**

Activity	Time (working hours)
1. Lecture	15
2. Labs	15
3. Consultations	5
4. Preparation to pass the course	5
5. Elaboration of lab reports	10

**Student's workload**

Source of workload	hours	ECTS
Total workload	50	2
Contact hours	32	1
Practical activities	25	1