

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Power quality		Code 1010311371010315995
Field of study Electrical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty Power Networks and Electric Power System	Subject offered in: English	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: - Classes: - Laboratory: 15 Project/seminars: -		No. of credits 2
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		ECTS distribution (number and %)
Responsible for subject / lecturer: mgr. inż. Krzysztof Łowczowski email: krzysztof.lowczowski@put.poznan.pl tel. 616652270 Wydział Elektryczny Piotrowo3A		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	basics knowledge of electrotechnics, thermodynamics and signal processing
2	Skills	has basic computer skills and is able to describe physical phenomena using mathematical formulas
3	Social competencies	ability to work in a team and initiative in gaining knowledge
Assumptions and objectives of the course: Poznanie praktycznych problemów związanych z jakością energii elektrycznej w sieciach elektroenergetycznych		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has general knowledge of power quality. - [-]		
Skills:		
1. Is able to indicate places where power quality is disturbed and is able to improve power quality in such places - [-]		
Social competencies:		
1. Is aware of impact of electrical engineering in general and power quality on proper operation of power systems - [-]		
Assessment methods of study outcomes		
Written test, reports of experiments		
Course description		
Measurements of voltage and current quality. Analysis of load profiles in distribution system networks. Harmonics and interharmonics analysis. Analysis of voltage sags, swells fluctuations and assymetry. Impact of load on power system. Indication of source of disturbances. Means for improving the quality of energy in power grids.		

Basic bibliography:		
1. Schlabbach J., Blume D., Stephanblome T., Voltage Quality in Electrical Power Systems, The Institution of Electrical Engineers, London 2001.		
2. Baggini A., Handbook of Power Quality, John Wiley & Sons 2008.		
3. 3. Norma PN-EN 50160, Parametry napięcia zasilającego w publicznych sieciach rozdzielczych.		
4. Schlabbach J., Blume D., Stephanblome T., Voltage Quality in Electrical Power Systems, The Institution of Electrical Engineers, London 2001.		
5. Baggini A., Handbook of Power Quality, John Wiley & Sons 2008.		
6. Norma PN-EN 50160, Parametry napięcia zasilającego w publicznych sieciach rozdzielczych.		
7. Schlabbach J., Blume D., Stephanblome T., Voltage Quality in Electrical Power Systems, The Institution of Electrical Engineers, London 2001.		
8. Baggini A., Handbook of Power Quality, John Wiley & Sons 2008.		
9. 3. Norma PN-EN 50160, Parametry napięcia zasilającego w publicznych sieciach rozdzielczych.		
Additional bibliography:		
1. . Normy PN-EN 61000-3/4/: Kompatybilność elektromagnetyczna (EMC) ? Dopuszczalne poziomy .. /Metody badań ... /Miernik migotania światła.		
2. . Normy PN-EN 61000-3/4/: Kompatybilność elektromagnetyczna (EMC) ? Dopuszczalne poziomy .. /Metody badań ... /Miernik migotania światła.		
3. . Normy PN-EN 61000-3/4/: Kompatybilność elektromagnetyczna (EMC) ? Dopuszczalne poziomy .. /Metody badań ... /Miernik migotania światła.		
Result of average student's workload		
Activity	Time (working hours)	
Student's workload		
Source of workload	hours	ECTS
Total workload	46	2
Contact hours	19	1
Practical activities	35	1