

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Electric Power System Operation</b>		Code <b>1010314391010316898</b>
Field of study <b>Electrical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>5 / 9</b>
Elective path/specialty <b>Electric Power Systems</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>part-time</b>	
No. of hours Lecture: <b>9</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>9</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 inż. Ireneusz Grządziński email: ireneusz.grzadzinski@put.poznan.pl tel. 61 665 2635 (2392) Faculty of Electrical Engineering Piotrowo 3A, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Possesses basic knowledge of the theory of electrical circuits, electrical machines, electric power engineering and electrical power generation
2	<b>Skills</b>	Has effective self-study ability in the domain of the chosen specialization, is able to integrate the knowledge acquired at the credited courses
3	<b>Social competencies</b>	Is aware of the need to develop his knowledge and competencies, is ready to undertake the cooperation and team work
<b>Assumptions and objectives of the course:</b> Getting knowledge of the electric power system operation under steady operating conditions-computations of the symmetrical and asymmetrical steady short-circuit conditions in the power system, practical use of the short-circuit computation program SCC and DAKAR.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. Has knowledge of the electric power devices - [K_W08++] 2. Has knowledge of the electric power system fundamentals including structure and operation states of the electric power sectors: generation, transmission and distribution, knows basic rules of the operation and maintenance of the electric power system elements - [K_W24 +++]		
<b>Skills:</b> 1. Can prepare and show a brief presentation concerning the electrical engineering-related task - [K_U08++] 2. Can compare different design solutions in the scope of basic problems of the electrical engineering domain regarding chosen technical and economic criterions - [K_U12+]		
<b>Social competencies:</b> 1. Is aware of the weight and understands different aspects and effects of the electric engineer's activities including those related to the environmental impact and regarding the responsibility for the undertaken decisions - [K_K02++]		
<b>Assessment methods of study outcomes</b>		

<p>Lectures:  1.Asesment of the knowledge and skills shown at the written and oral examinations ,  2.Continuous assessment during courses ( bonus for activity and perception quality).</p> <p>Project:  1.On-line assessment of the preparation to the design tasks,  2.Evaluation of the completed design task.</p>		
<b>Course description</b>		
<p>Lectures: Transient states in the electric power system. Calculations of the steady short-circuit conditions in the electric power system - non-symmetrical short-circuit analysis using symmetrical component method, models of the system elements for symmetrical components.  Project: includes the design tasks from the scope of the knowledge handed over at the lectures in the semester 8 and 9.</p>		
<b>Basic bibliography:</b>		
1. Kremens Z. , Sobierajski M. : Analiza systemów elektroenergetycznych. WNT, Warszawa, 1996. 2. Kacejko P., Machowski J.: Zwarcia w systemach elektroenergetycznych. WNT, Warszawa, 2002. 3. Poradnik Inżyniera Elektryka . t.3. WNT, Warszawa 2005		
<b>Additional bibliography:</b>		
1. Cegielski M.: Sieci i systemy elektroenergetyczne. PWN, Warszawa, 1979. 2. Kończykowski S., Bursztyński J.: Zwarcia w układach elektroenergetycznych. WNT, Warszawa, 1965.		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. participation in lecture courses	9	
2. participation in project classes	9	
3. participation in discussions related to lectures	4	
4. participation in discussions related to project	4	
5. preparation to project classes	8	
6. elaborate to project	10	
7. preparation to examination	10	
8. taking an examination	3	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	48	2
Contact hours	29	1
Practical activities	23	1