

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Electric power machines and technologies</b>		Code <b>1010311431010315639</b>
Field of study <b>Power Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>-</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>30</b> Classes: <b>15</b> Laboratory: <b>15</b> Project/seminars: <b>-</b>		No. of credits <b>4</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>4 100%</b> <b>4 100%</b>
<b>Responsible for subject / lecturer:</b>  Krzysztof Sroka email: krzysztof.sroka@put.poznan.pl tel. 61 665 22 75 Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of mechanics, thermodynamics and fluid mechanics and electrical engineering
2	<b>Skills</b>	Ability to effectively self-education in a field related to the chosen field of study
3	<b>Social competencies</b>	Is aware of the need to broaden their competence, willingness to work together as a team
<b>Assumptions and objectives of the course:</b> The skills and competencies of machinery and power equipment, energy system design and evaluate its performance		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has theoretically founded basic knowledge of primary energy conversion technologies to work, heat and electricity - [K_W06+++]		
2. He has a basic knowledge of mechanical and thermal energy facilities, nuclear and renewable energy, as well as refrigeration, gas, ventilation and environmental - [K_W06+++]		
3. He knows the basic conditions and technical problems associated with the use of different technologies and sources of energy - [K_W11++]		
<b>Skills:</b>		
1. Able to analyze of operation of the machine, describe the characteristic phenomena in the flow channels, design and installation of the machine to choose - [K_U07++K_U19+]		
2. Able to analyze basic and complex energy conversion systems - [K_U07++K_U18+]		
3. Albe to use theoretical knowledge to balance of energy technology systems - [K_U22++]		
<b>Social competencies:</b>		
1. Able to work in a group in the performance of laboratory tests and jointly present the effects of the work - [K_K04+]		
<b>Assessment methods of study outcomes</b>		

<p>Lectures:  - evaluation of the knowledge and skills listed on the written exam,  Classes:  - credit on the basis of the current check messages and two written tests of the accounting tasks  Laboratory:  - tests the knowledge necessary for the accomplishment of the problems in the area of ??laboratory tasks,  - assessment of knowledge and skills related to the implementation of the tasks your practice, the assessment of report of performed exercise,  - obtaining additional points for the ability to work within a team practice performing the task detailed in the laboratory and developed aesthetic diligence reports.</p>		
<b>Course description</b>		
<p>Primary and processed forms of energy. The structure of energy resources. Engines and working machines ? basic types, working rules, ranges of applications. The main technologies of primary energy conversion to work, heat and electricity: internal combustion engines, steam technologies, gas technologies, gas-steam technologies. Comparative and real circuits. Construction of internal combustion engines, boilers, turbines, pumps, heat exchangers. Promising energy technologies.</p>		
<b>Basic bibliography:</b>		
<p>1. M. Pawlik, F. Strzelczyk: Elektrownie, WNT W-wa 2012, 2017  2. T.Chmielniak: Technologie energetyczne, WNT W-wa 2014  3. W.R. Gundlach: Podstawy maszynprzepływowych i ich systemów energetycznych, WNT W-wa 2016</p>		
<b>Additional bibliography:</b>		
<p>1. W. M. Lewandowski - Proekologiczne źródła energii odnawialnej, WNT W-wa 2012  2. J. Marecki: Podstawy przemian energetycznych, WNT W-wa 2014  3. P. Orłowski, W. Dobrzański, E. Szwarc - Kotły parowe. Konstrukcja i obliczenia, WNT W-wa 1979</p>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. participation in the lectures	45	
2. participation in the laboratory exercises	15	
3. preparation to the laboratory exercises	14	
4. preparation of practical exercises reports	14	
5. participation in the auditorium exercises	15	
6. preparation to the auditorium exercises	7	
7. participation in the consulting on the auditorium exercises and laboratory exercises	5	
8. preparation to the exam	15	
9. participation in the exam	3	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	133	4
Contact hours	83	3
Practical activities	48	2