

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Electric power machines and technologies</b>		Code <b>1010314451010315639</b>
Field of study <b>Power Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 5</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>part-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>15</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>5</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>5 100%</b> <b>5 100%</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          L          -</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>		
<ol style="list-style-type: none"> <li>1. D. Laudyn, M. Pawlik, F. Strzelczyk ? Elektrownie, WNT W-wa 2000</li> <li>2. W. M. Lewandowski - Proekologiczne źródła energii odnawialnej, WNT W-wa 2001</li> <li>3. D. Laudyn, M. Pawlik, F. Strzelczyk ? Elektrownie, WNT W-wa 2000</li> <li>4. W. M. Lewandowski - Proekologiczne źródła energii odnawialnej, WNT W-wa 2001</li> </ol>		
<b>Additional bibliography:</b>		
<ol style="list-style-type: none"> <li>1. W. Szuman ? Maszyny i urządzenia energetyczne, WSiP W-wa 1985</li> <li>2. M. Pawlik, J. Skierski ? Układy i urządzenia potrzeb własnych. WNT W-wa 1986</li> <li>3. P. Orłowski, W. Dobrzański, E. Szwarc - Kotły parowe. Konstrukcja i obliczenia, WNT W-wa 1979</li> <li>4. W. Szuman ? Maszyny i urządzenia energetyczne, WSiP W-wa 1985</li> <li>5. M. Pawlik, J. Skierski ? Układy i urządzenia potrzeb własnych. WNT W-wa 1986</li> <li>6. P. Orłowski, W. Dobrzański, E. Szwarc - Kotły parowe. Konstrukcja i obliczenia, WNT W-wa 1979</li> </ol>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. participation in the lectures	30	
2. participation in the auditorium exercises	15	
3. preparation to the auditorium exercises	21	
4. participation in the consulting on the auditorium exercises	5	
5. preparation to the exam	45	
6. participation in the exam	5	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	121	5
Contact hours	55	2
Practical activities	0	0