

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Nuclear power plants</b>		Code <b>1010312331010316099</b>
Field of study <b>Electrical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 3</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>Second-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>-</b> Project/seminars: <b>-</b>		No. of credits <b>1</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>1 100%</b> <b>1 100%</b>
<b>Responsible for subject / lecturer:</b>  Radosław Szczerbowski email: radoslaw.szczerbowski@put.poznan.pl tel. 61 665 20 30 Elektryczny ul. Piotrowo 3A, 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Knowledge of power generation technologies: energy conversion, efficiency of conversions and thermodynamic cycles.
2	<b>Skills</b>	Understand the basic principles of operation of the machines and know the basic construction of conventional energy devices.
3	<b>Social competencies</b>	Is aware of necessary expand their skills and readiness to work together as a team.
<b>Assumptions and objectives of the course:</b> Understanding the basic types of nuclear reactors. Construction, concepts and thermal systems of nuclear power plants. Nuclear safety and security problems. Understanding the trends and development in the nuclear power.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Understand nature of developments in a nuclear reactor and process implemented in nuclear power plants, understands the impact of energy conversion processes occurring in nuclear power plants on the environment - [K_W03++]		
2. The student has the knowledge to analyze the technological systems nuclear power plants and to assess the importance of nuclear power plants safety. - [[K_W12++]		
<b>Skills:</b>		
1. It can integrate knowledge in the field of electrical engineering, electronics, computing, control, and other disciplines to assess the role, tasks and other non-technical aspects (including economic and legal) nuclear power plants in the power system - [ [K_U15++]		
<b>Social competencies:</b>		
1. Understands the need to definition and provide reliable information and opinion on nuclear power, presenting different points of view - [ [K_K02+++]		
<b>Assessment methods of study outcomes</b>		

<p>Continuous assessment in the classroom. Skill and competence by conducting discussions on current issues of nuclear energy.</p> <p>Credit on the basis of written work consisting of answers to 10 questions and 3 questions test problem with range of topics covering topics classes.</p>		
<b>Course description</b>		
<p>The state of development of nuclear power in the world. Classification of nuclear reactors. Generations of nuclear power reactors. The basic types of nuclear reactors and their safety features. Construction, concept and basic technological systems of nuclear reactors, fuel elements and structure of the core. Operating parameters of the reactors. Equipment and auxiliary systems. Nuclear safety issues - the importance of nuclear power plants safety and security of the entire nuclear energy. The development of the nuclear power industry.</p>		
<b>Basic bibliography:</b>		
<ol style="list-style-type: none"> <li>1. Celiński Z., Strupczewski A., Podstawy energetyki jądrowej, WNT, 1984</li> <li>2. Paska J., Elektrownie jądrowe, Oficyna Wydawnicza Politechniki Warszawskiej, 1990</li> <li>3. Celiński Z., Energetyka jądrowa. PWN. 1991</li> <li>4. Celiński Z., Energetyka jądrowa a społeczeństwo. PWN. 1992</li> <li>5. Kubowski J.: Nowoczesne elektrownie jądrowe. Warszawa: WNT 2010</li> <li>6. Kielkiewicz M.: Jądrowe reaktory energetyczne. Warszawa: WNT 1978</li> <li>7. Celiński Z., Strupczewski A., Podstawy energetyki jądrowej, WNT, 1984</li> <li>8. Ackermann G., Eksploatacja elektrowni jądrowych, WNT</li> <li>9. Paska J., Elektrownie jądrowe, Oficyna Wydawnicza Politechniki Warszawskiej, 1990</li> <li>10. Celiński Z., Energetyka jądrowa. PWN. 1991</li> <li>11. Kubowski J.: Nowoczesne elektrownie jądrowe. Warszawa: WNT 2010</li> </ol>		
<b>Additional bibliography:</b>		
<ol style="list-style-type: none"> <li>1. Ackermann G., Eksploatacja elektrowni jądrowych, WNT</li> <li>2. Jezierski G., Energia jądrowa wczoraj i dziś, WNT, 2005</li> <li>3. Kielkiewicz M., Teoria reaktorów jądrowych. WNT. 1987</li> <li>4. Hrynkiewicz A., Energia wyzwanie XXI wieku. Wydawnictwo Uniwersytetu Jagiellońskiego. 2002</li> <li>5. Lech M., Kierunki rozwoju elektrowni jądrowych, Oficyna Wydawnicza Politechniki Wrocławskiej, 1997</li> <li>6. Jezierski G., Energia jądrowa wczoraj i dziś, WNT, 2005</li> <li>7. Hrynkiewicz A., Energia wyzwanie XXI wieku. Wydawnictwo Uniwersytetu Jagiellońskiego. 2002.</li> </ol>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. participation in lectures	15	
2. exam preparation	12	
3. presence on the exam	5	
4. the consultation of lectures	5	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	37	1
Contact hours	25	1
Practical activities	0	0