

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Nuclear Power Engineering		Code 1010311441010315644
Field of study Power Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 4
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: - 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 technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr inż. Krzysztof Sroka email: krzysztof.sroka@put.poznan.pl tel. 61 665 22 75 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		Responsible for subject / lecturer: dr inż. Radosław Szczerbowski email: radoslaw.szczerbowski@put.poznan.pl tel. 61 665 20 30 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of physics, chemistry, basics of electricity and basis of thermal energy.
2	Skills	Solving tasks of the balance of mass and energy in simple circuits of thermal power plants.
3	Social competencies	Is aware of the need to broaden their competence, willingness to work together as a team.
Assumptions and objectives of the course: Acquiring basic knowledge of physics nuclear power reactors and get acquainted with currently available technologies used in nuclear power.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Understand the essence of the phenomena occurring in a nuclear reactor and process carried in nuclear power plants - [K_W06++]		
2. It has a basic knowledge of the structure and types of nuclear reactors and nuclear power plants and knows the basic technology to ensure safe operation of nuclear power plant - [K_W21+++K_W20++]		
3. He knows and understands the impact of energy conversion processes in a nuclear power plant on the environment - [K_W08++]		
Skills:		
1. Able to perform basic calculations of criticality conditions for a nuclear power reactor - [K_U07++]		
2. Able to calculate the thermal circuits realized in nuclear power plants - [K_U22++]		
Social competencies:		
1. Is aware of the great responsibility of an engineer in the nuclear power industry for decisions - [K_K02+]		
Assessment methods of study outcomes		
- evaluation of the knowledge and skills demonstrated on the basis of the current check posts and two written tests, - continuous evaluation skills and expertise for each class by conducting discussions on current issues related to the prospect of nuclear power development.		

Course description		
<p>Nuclear fuels and their properties. The essence of uranium fission ? fissions fragments, the energy of fission, radioactive fragments of fissions chains. Interaction of neutrons with the medium ? cross sections. Slowing of the neutrons. The escape of neutrons from the reactor. The life cycle of neutrons ? reactor criticality conditions. The equation for the balance of neutrons in the reactor. Solution of the wave equation for a sphere reactor. Types of nuclear reactors. Safety systems in nuclear power plants. Fuel cycle. Landfilling.</p>		
<p>Basic bibliography:</p> <p>1. Z. Celiński, A. Strupczewski, ?Podstawy energetyki jądrowej?, WNT, Warszawa 1984 2. Z. Celiński, ?Energetyka jądrowa?, PWN, Warszawa 1991</p>		
<p>Additional bibliography:</p> <p>1. M. Kielkiewicz, ?Teoria reaktorów jądrowych?, PWN, Warszawa 1987 2. A. Strupczewski, ?Awarie reaktorowe a bezpieczeństwo energetyki jądrowej?, WNT, Warszawa 1990.</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. participation in the lectures	30	
2. participation in the consulting	5	
3. preparation for the tests	15	
Student's workload		
Source of workload	hours	ECTS
Total workload	50	2
Contact hours	35	1
Practical activities	0	0