

| STUDY MODULE DESCRIPTION FORM | | |
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| 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 | | |
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| <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> <ol style="list-style-type: none"> 1. J. Kubowski, Nowoczesne Elektrownie Jądrowe , WNT 2009 2. Z. Celiński, A. Strupczewski, ?Podstawy energetyki jądrowej?, WNT, Warszawa 1984 3. Z. Celiński, ?Energetyka jądrowa?, PWN, Warszawa 1991 4. B. Barré, Wszystko o energetyce jądrowej. Od atomu A do cyrkonu Zr , (2008) Areva, ISBN 978-83-933964-0-5 | | |
| <p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. G. Jezierski, Energia jądrowa wczoraj i dziś , WNT 2006 2. M. Kielkiewicz, ?Teoria reaktorów jądrowych?, PWN, Warszawa 1987 3. A. Strupczewski, ?Awarie reaktorowe a bezpieczeństwo energetyki jądrowej?, WNT, Warszawa 1990. | | |
| 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 |