



Subject card

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|---|--|--|---|-------------------------------------|--|------------|-----|
| Subject name and code | NUCLEAR ENERGY, PG_00048959 | | | | | | |
| Field of study | Green Technologies | | | | | | |
| Date of commencement of studies | October 2022 | | Academic year of realisation of subject | | 2022/2023 | | |
| Education level | second-cycle studies | | Subject group | | Obligatory subject group in the field of study | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 1 | | Language of instruction | | English | | |
| Semester of study | 2 | | ECTS credits | | 3.0 | | |
| Learning profile | general academic profile | | Assessment form | | exam | | |
| Conducting unit | Department of Electrical Power Engineering -> Faculty of Electrical and Control Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Marcin Jaskólski | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 0.0 | 0.0 | 15.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 30 | | 5.0 | | 40.0 | 75 |
| Subject objectives | The aim of the course is to familiarize students with the technology of generating electricity in nuclear power plants. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K7_W03] will have a detailed knowledge of the theoretical basis of methods and types of apparatus used in chemical analysis of environmental pollutants and the technology of cleaning and neutralization of industrial waste and wastewater management and the design and supervision of environmentally friendly technologies | | Can describe the risks associated with the production of electricity and ways to minimize them. | | [SW1] Assessment of factual knowledge | | |
| | [K7_W06] has a advanced knowledge of knowledge of the principles of sustainable development as well as national and European environmental management conditions, in the protection of intellectual property and patent law | | Has knowledge of the functioning of selected electricity generation technologies and their impact on the environment. | | [SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation | | |
| | [K7_U02] able to operate equipment and perform typical analyzes of studies of environmental pollution and design and oversee the environmentally friendly technologies and zero-waste technologies, can perform expert on the environmental impact of technology already working | | Is able to present system solutions for environmental protection during the operation of generating sources. | | [SU3] Assessment of ability to use knowledge gained from the subject | | |
| Subject contents | Atom structure. Historical overview of nuclear energy. Nuclear power in the world. Fission of the uranium nucleus. Multiplication factor and reactivity. Microscopic and macroscopic cross-section. Slowing neutrons. Nuclear reactions. Classification of nuclear reactors. Construction of the basic types of nuclear units. Nuclear power plant efficiency. Nuclear fuel cycle. The future of nuclear energy. | | | | | | |
| Prerequisites and co-requisites | | | | | | | |

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| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Written exam | 60.0% | 65.0% |
| | Seminar presentation | 60.0% | 35.0% |
| Recommended reading | Basic literature | 1. Krivit B. K. i in.: Nuclear Energy Encyclopedia: Science, Technology, and Applications, John Wiley and Sons 2011 2. Glasstone S., Sesosnke A., Nuclear Reactor Engineering, Springer 1984 | |
| | Supplementary literature | https://www-pub.iaea.org/MTCD/Publications/PDF/cnpp2019/pages/index.htm https://www.intechopen.com/books/nuclear-power-plants https://www.iaea.org/publications/series | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| | Example issues/ example questions/ tasks being completed | 101. Draw schematic diagrams of PWR and BWR. Describe components in each system. 102. Describe briefly the methods of reactor power control by operators? 103. What is used as a cooling agent in a primary cycle of a PWR and what are the typical parameters of this agent (pressure, temperature)? 104. Describe briefly the two most commonly applied methods of nuclear fuel enrichment. | |
| Work placement | Not applicable | | |