

| STUDY MODULE DESCRIPTION FORM | | |
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| Name of the module/subject Renewable Energy Sources | | Code 1010621251010638150 |
| Field of study Mechanical Engineering | Profile of study (general academic, practical) (brak) | Year /Semester 3 / 5 |
| Elective path/specialty Thermal Engineering and Renewable Energy | 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: 2 Classes: - Laboratory: - Project/seminars: - | | No. of credits 3 |
| 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 %) 100 3% 100 3% |
| Responsible for subject / lecturer: dr inż Robert Kłosowiak email: robert.klosowiak@put.poznan.pl tel. 6652331 Maszyn Roboczych i Transportu Piotrowo 3A, 60-965 Poznań | | |
| Prerequisites in terms of knowledge, skills and social competencies: | | |
| 1 | Knowledge | Basic information on thermodynamics, fluidity mechanics and flow processes and thermal energy |
| 2 | Skills | Ability to describe and calculate basic thermodynamic processes and simple thermal energy conversion systems. The ability of effective self-education in the field related to the chosen field of study |
| 3 | Social competencies | Is aware of the need to expand their competence, readiness to cooperate within the team |
| Assumptions and objectives of the course: Acquainting with basic thermodynamic processes, thermodynamic transformations and energy conservation equations. Understanding the methods of description of various thermodynamic factors and thermodynamic cycles that implement the assumed processes of thermal and mechanical energy conversion in the left-side cycles. Familiarization with available forms of renewable energy and its path of conversion. | | |
| Study outcomes and reference to the educational results for a field of study | | |
| Knowledge: 1. Has knowledge in the field of mathematics, including algebra, analysis, theory of differential equations, probabilistic, analytical geometry necessary for: description of the operation of discrete mechanical systems, understanding of computer graphics methods, description of the operation of electrical and mechatronic systems - [M1_W01] 2. Has knowledge in physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialized lectures in the theory of construction materials and materials, theory of machines and mechanisms, the theory of electric drives and mechatronic systems . - [M1_W02] | | |
| Skills: 1. Can acquire information from literature, the internet, databases and other sources. Can integrate the information obtained and interpret conclusions and create and justify opinions - [M1_U01] 2. Is able to search in catalogs and on manufacturers' websites ready machine components for use in own projects. - [M1_U02] | | |
| Social competencies: 1. Is ready to critically evaluate your knowledge and content you receive - [M1_K01] 2. Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in the event of difficulties in solving the problem - [M1_K02] | | |

| Assessment methods of study outcomes | | |
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| - checking and rewarding the knowledge necessary to implement the set problems in a given area of laboratory tasks, assessment of knowledge and skills related to the implementation of the laboratory exercise, evaluation of the report on the performed exercise. | | |
| Course description | | |
| Getting to know the technology of generating heat from renewable energy sources. Conducting analysis of the work of thermal cycles, calculation of thermal cycles at characteristic points. Reading and creating technological schemes. | | |
| Basic bibliography: | | |
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| Additional bibliography: | | |
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| Result of average student's workload | | |
| Activity | Time (working hours) | |
| 1. Udział w zajęciach | 15 | |
| 2. Konsultacje | 1 | |
| 3. Przygotowanie do zajęć | 2 | |
| 4. Przygotowanie do zaliczenia | 5 | |
| 5. Zaliczenie | 1 | |
| Student's workload | | |
| Source of workload | hours | ECTS |
| Total workload | 20 | 3 |
| Contact hours | 15 | 1 |
| Practical activities | 15 | 1 |