

| STUDY MODULE DESCRIPTION FORM | | |
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| Name of the module/subject Hybrid powertrains | | Code 1010624261010622492 |
| Field of study Mechanical Engineering | Profile of study (general academic, practical) general academic | Year /Semester 3 / 6 |
| Elective path/specialty Mass Transport Vehicles | Subject offered in: Polish | Course (compulsory, elective) obligatory |
| Cycle of study: First-cycle studies | Form of study (full-time,part-time) part-time | |
| No. of hours Lecture: 9 Classes: 9 Laboratory: 9 Project/seminars: - | | No. of credits 3 |
| Status of the course in the study program (Basic, major, other) other | | (university-wide, from another field) university-wide |
| Education areas and fields of science and art technical sciences Technical sciences | | ECTS distribution (number and %) 3 100% 3 100% |
| Responsible for subject / lecturer: DSc. DEng. Piotr Lijewski email: piotr.lijewski@put.poznan.pl tel. 61 6652045 Faculty of Transport Engineering Piotrowo 3 Street, 60-965 Poznań | | Responsible for subject / lecturer: DSc. DEng. Piotr Lijewski email: piotr.lijewski@put.poznan.pl tel. 61 6652045 Faculty of Transport Engineering Piotrowo 3 Street, 60-965 Poznań |
| Prerequisites in terms of knowledge, skills and social competencies: | | |
| 1 | Knowledge | Student has a basic knowlage of the design of hybrid powertrain for automotive aplication |
| 2 | Skills | student is able to integrate the information, make their interpretation, draw conclusions, formulate and justify opinions |
| 3 | Social competencies | student is aware of the important means non-technical aspects and impacts of transport |
| Assumptions and objectives of the course: Basic knowlage about the designe of hybrid powertrains in passenger vehicles, buses and trucks and buses. | | |
| Study outcomes and reference to the educational results for a field of study | | |
| Knowledge: | | |
| 1. Student has knowlege about disigne and operations of hybrid powertrain. - [-] | | |
| Skills: | | |
| 1. The student knows how to use analytical and experimental methods for formulating and solving problems related to the hybrid system in vehicles - [-] | | |
| 2. Student can obtain information from the literature, to make them identify and formulate specific proposals for hybrid - [-] | | |
| 3. Student Able to plan and carry out experiments on hybrids powertrain - [-] | | |
| 4. The student is able to analyze and evaluate the functioning of the existing hybrid technology - [-] | | |
| Social competencies: | | |
| 1. The student understands the necessity of lifelong learning - raising professional and personal competences - [-] | | |
| 2. The student is able to think and act in a creative and enterprising - [-] | | |
| 3. The student is aware of their responsibility for collaborative tasks related to teamwork - [-] | | |
| Assessment methods of study outcomes | | |
| Written and oral exam. | | |

| Course description | | |
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| Design of hybrid powertrain (parallel, serial). Operation parameters of hybrid powertrain. Emission and fuel consumption of hybrid powertrain. Energy storage. Developments in hybrid powertrains. | | |
| Basic bibliography: | | |
| 1. Merksiz J., Pielecha I.: Układy mechaniczne pojazdów hybrydowych. Wydawnictwo Politechniki Poznańskiej, Poznań 2015 | | |
| 2. Merksiz J., Pielecha I.: Układy elektryczne pojazdów hybrydowych. Wydawnictwo Politechniki Poznańskiej, Poznań 2015 | | |
| 3. Merksiz J., Pielecha I.: Alternatywne napędy pojazdów. Wydawnictwo Politechniki Poznańskiej, Poznań 2006. | | |
| 4. Merksiz J., Pielecha I.: Alternatywne paliwa i układy napędowe pojazdów. Wydawnictwo Politechniki Poznańskiej, Poznań 2004. | | |
| Additional bibliography: | | |
| 1. Automotive industry materials. | | |
| Result of average student's workload | | |
| Activity | Time (working hours) | |
| 1. Participation in the lecture | 9 | |
| 2. Exam preparation | 5 | |
| 3. Participation in the exam | 1 | |
| Student's workload | | |
| Source of workload | hours | ECTS |
| Total workload | 33 | 3 |
| Contact hours | 27 | 3 |
| Practical activities | 0 | 0 |