



Subject card

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|---|--|--|-------------------------------------|------------|---|---------|-----|
| Subject name and code | Modelling of hydraulic systems, PG_00057402 | | | | | | |
| Field of study | Mechanical Engineering | | | | | | |
| Date of commencement of studies | February 2024 | Academic year of realisation of subject | | | 2024/2025 | | |
| Education level | second-cycle studies | Subject group | | | Optional subject group Subject group related to scientific research in the field of study | | |
| Mode of study | Full-time studies | Mode of delivery | | | at the university | | |
| Year of study | 1 | Language of instruction | | | Polish | | |
| Semester of study | 2 | ECTS credits | | | 3.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Department of Mechanics and Mechatronics -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Paweł Śliwiński | | | | | |
| | Teachers | dr hab. inż. Paweł Śliwiński dr inż. Paweł Załuski | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 15.0 | 15.0 | 0.0 | 45 |
| | 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 | 45 | 6.0 | | 24.0 | | 75 |
| Subject objectives | The study of hydraulic systems design | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | [K7_W08] possesses widened knowledge within the range of design methods of hydraulic systems, heating and fluid-flow machines and transport devices | | | | [SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects | | |
| | [K7_W05] possesses profound knowledge on the operation of complex systems and mechanical devices, including process equipment | | | | [SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects | | |
| | [K7_U05] is able to plan and conduct the experimental research determining the parameters of a device or system, assesses the usability and correctly selects methods and tools, is able to interpret the results and estimate the measurement errors and is able to apply computer systems to simulate the operation of a machine or technology | | | | [SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task | | |

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| Subject contents | <p>1. Energy efficiency of the system. Thermal calculations. Selection of the tank. Selection of the cooler.</p> <p>2. Design of power pack. Development of the technical documentation of the project.</p> <p>3. Circuits with power recuperation.</p> <p>4. Hydraulic accumulators and their selection for the hydraulic system.</p> <p>5. Proportional valves and their selection for the hydraulic system.</p> <p>6. Servo valve and its selection for the hydraulic system.</p> <p>7. Load Sensing systems.</p> | | |
| Prerequisites and co-requisites | Knowledge of the basics of hydraulics from the first cycle studies. | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Project | 56.0% | 20.0% |
| | Written exam | 56.0% | 60.0% |
| | Practical exercise | 56.0% | 20.0% |
| Recommended reading | Basic literature | 1. A. Osiecki, Hydrostatic drive of machines, WNT, Warszawa 1998. 2. Z. Szydelski, Drive and hydraulic control, WKŁ Warszawa 1999. 3. S. Stryczek, Hydrostatic drive, PWN Warszawa 1990. | |
| | Supplementary literature | Hydraulics and pneumatics - science and technic monthly magazine. Pneumatics - science and technic monthly magazine. | |
| | eResources addresses | Adresy na platformie eNauczenie: | |
| Example issues/ example questions/ tasks being completed | The heat balance of the system. Systems with proportional valves. Systems with servo valves. | | |
| Work placement | Not applicable | | |

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