



Subject card

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|---|---|--|---|------------|------------|--|-----|
| Subject name and code | Material behaviour during joining , PG_00050174 | | | | | | |
| Field of study | Mechanical Engineering, Mechanical Engineering | | | | | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | | | | 2022/2023 | |
| Education level | first-cycle studies | Subject group | | | | Optional subject group Subject group related to scientific research in the field of study | |
| Mode of study | Part-time studies | Mode of delivery | | | | at the university | |
| Year of study | 3 | Language of instruction | | | | Polish | |
| Semester of study | 6 | ECTS credits | | | | 4.0 | |
| Learning profile | general academic profile | Assessment form | | | | exam | |
| Conducting unit | Department of Materials Engineering and Bonding -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Dariusz Fydrych | | | | |
| | Teachers | | dr hab. inż. Dariusz Fydrych | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 15.0 | 0.0 | 0.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |
| Zachowanie materiałów w czasie spajania, Mechanika i budowa maszyn, I stopnia – inżynierskie, sem. 6, 2022/2023 - Moodle ID: 29494 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29494 | | | | | | | |
| 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 | 8.0 | | 62.0 | 100 | |
| Subject objectives | Obtaining of knowledge of weldability of stel and nonferrous metals | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | | Method of verification | |
| | [K6_U10] is able to formulate the principles of selecting a material for a construction, ensuring the correct operation of a device | | Student can recognize the constructional materials and their operating properties. | | | [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information | |
| | [K6_W03] possesses and is able to practically apply the knowledge on the construction, properties and testing methods of construction materials | | Student can choose the method of joining (fusion welding, resistance welding, soldering) for a group of materials and he can develop the technical procedure specification. | | | [SW1] Assessment of factual knowledge | |
| Subject contents | LECTURE | | | | | | |
| | Weldability. The phenomena of cracking during the welding process. Hot, cold, lamellar and reheat cracks. Weldability of alloy steels. Characteristics of consumables. Thermal field, thermal cycle. Crystallization of the weld metal. Metallurgical reactions and slag properties. Design of the weld metal. Heat affected zone. CTP and CTPcs charts. The concept of t8/5. Weldability of ferrous and nonferrous alloys. | | | | | | |
| Subject contents | LABORATORY | | | | | | |
| | Determination of susceptibility of steel to hot and cold cracking. Evaluation of weldability of mild and high alloyed steels. Determination of diffusible hydrogen content in deposited metal. | | | | | | |
| Prerequisites and co-requisites | | | | | | | |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
|--|--|---|-------------------------------|
| | Passed laboratories | 60.0% | 40.0% |
| | Written test | 60.0% | 60.0% |
| Recommended reading | Basic literature | 1. Tasak E.: Spawalność stali. Wyd. Fotobit, Kraków, 2002. 2. Praca zbiorowa: Poradnik Inżyniera - Spawalnictwo. WNT, Warszawa, 2003. 3. Tasak E.: Metalurgia spawania. Wyd. Jak, Kraków, 2008. | |
| | Supplementary literature | 1. Jakubiec M., Lesiński K., Czajkowski H.: Technologia konstrukcji spawanych. WNT Warszawa 1987. 2. Pilarczyk J., Pilarczyk J.: Spawanie i napawanie elektryczne metali. Wydawnictwo Śląsk Katowice 1996. | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | Describe weldability of heat resistant steel. Describe weldability of stainless steel. Describe weldability of aluminium alloys. | | |
| Work placement | Not applicable | | |