



Subject card

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|---|--|--|---|-------------------------------------|--|------------|-----|
| Subject name and code | Welding Technology, PG_00045054 | | | | | | |
| Field of study | Ocean Engineering, Ocean Engineering | | | | | | |
| Date of commencement of studies | October 2020 | | Academic year of realisation of subject | | 2021/2022 | | |
| Education level | first-cycle studies | | Subject group | | Obligatory subject group in the field of study 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 | 2 | | Language of instruction | | Polish | | |
| Semester of study | 4 | | ECTS credits | | 3.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| 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 | | mgr inż. Dariusz Duda 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 | 30.0 | 0.0 | 0.0 | 45 |
| | E-learning hours included: 0.0 | | | | | | |
| | Address on the e-learning platform: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=10261 Adresy na platformie eNauczanie: | | | | | | |
| 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 | | 5.0 | | 25.0 | 75 |
| Subject objectives | Presentation of the basics of welding technology of metals | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems | | The student defines the concept of weldability and classifies welding technologies. | | [SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects | | |
| | [K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems | | The student is able to use information and technological, material and IT tools. | | [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task | | |
| Subject contents | <p>COURSE CONTENT</p> <p>Classification of welding and joining processes. Outline of welding thermal cycles. Phase transformations in the weld and heat affected zone. Definition of weldability. Basic and supplementary materials for welding. Basics of welding technology specification.</p> <p>Gas welding. Manual arc welding (MMA). Submerged arc welding under flux. TIG welding. Shielding gases. Gas-shielded arc welding MIG / MAG methods. Flux cored arc welding. Pulse arc welding. Laser welding, plasma and electron beam welding.</p> <p>Resistance pressure welding, spot and linear pressure welding, upset and flash welding. Basic parameters of the process. Other methods of pressure welding.</p> <p>Thermal cutting methods: oxygen cutting, plasma cutting. Cutting laser beam. Deformation and welding stress and methods for their reduction. Inspection of welded joints, imperfections definitions and methods for their detection.</p> <p>LABORATORY PRACTICAL TRAINING</p> <p>Manual arc welding with coated electrodes, automatic submerged arc welding. Gas-shielded arc welding. Pressure resistance welding. Gas welding and cutting. Structure of welded joints. Imperfections of welded joints</p> | | | | | | |

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| Prerequisites and co-requisites | Knowledge of basics of materials science | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Laboratory test | 60.0% | 40.0% |
| | Written test | 60.0% | 60.0% |
| Recommended reading | Basic literature | Basic literature 1. Klimpel A.: Technologia spawania i cięcia metali. Wyd. Politechniki Śląskiej, Gliwice 1997. 2. Walczak W. i inni: Spawalnictwo ćwiczenia laboratoryjne. Wyd. Politechniki Gdańskiej, Gdańsk, 2000. 3. Klimpel A., Mazur M.: Podręcznik spawalnictwa. Wyd. Politechniki Śląskiej, Gliwice 2004. | |
| | Supplementary literature | Supplementary literature 1. Ferenc K.: Spawalnictwo. WNT Warszawa 2007. 2. Ferenc K., Ferenc J.: Spawalnicze gazy osłonowe i palne. WNT Warszawa 2005. 3. Poradnik Inżyniera Spawalnictwo, tom I i II, WNT Warszawa, 2005 | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | Describe the process of welding | | |
| Work placement | Not applicable | | |