



Subject card

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| Subject name and code | Fundamentals of the Manufacturing Technologies, PG_00060535 | | | | | | |
| Field of study | Naval Architecture and Offshore Structures | | | | | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | | | 2024/2025 | | |
| 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 | 3 | ECTS credits | | | 3.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Zakład Wyposażenia Okrętu -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Wojciech Leśniewski | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 30.0 | 0.0 | 30.0 | 0.0 | 0.0 | 60 |
| | 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 | 60 | | 6.0 | | 9.0 | 75 |
| Subject objectives | The student acquires basic knowledge of manufacturing processes and processing of engineering materials. acquiring the ability to select and use machining methods to shape machine elements and give them specific functional properties. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K6_U01] can obtain information from literature, databases and other sources, can verify and organize the obtained information, interpret them and form conclusions and justified opinions | | The student searches for and collects information regarding the designed technological process. | | [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment | | |
| | [K6_W03] has knowledge of hydromechanics, thermodynamics, machine design, ecology, materials science necessary to understand the principles of construction and operation of ocean engineering facilities and equipment | | Understands the basic principles of technological processes used in the production of components of ocean technical devices. | | [SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge | | |
| | [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 | | Prepares technical and technological documentation of a selected machine element. | | [SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment | | |

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| Subject contents | <p>1. Classification of techniques for producing machine and device parts. machine technology, technological efficiency of the structure.</p> <p>2. Properties and principles of selection of engineering materials. Mechanical properties materials. Technological properties. Corrosion resistance of engineering materials.</p> <p>3. Techniques of obtaining metals and alloys. Metallurgy of steel and non-ferrous metals.</p> <p>4. Top layer technological and operational top layer. Change curve wear and tear over time. Shaping the operational properties of selected machine parts.</p> <p>5. Machining and advanced machining technologies. Technology machining. Turning cutting parameters, classification of methods, geometry tools. Milling. Abrasive processing technology grinding, abrasive blasting. Hole machining methods.</p> <p>6. Modern methods of shaping materials, surface engineering methods and applying coatings. Unconventional manufacturing techniques. Additive technologies: 3D printing FDM, DMLS.</p> <p>7. Methods of connecting machine parts.</p> <p>8. Production and technological process. Basics of process design technological.</p> | | |
| Prerequisites and co-requisites | <p>Knowledge of basic issues regarding the structure and properties of materials engineering and knowledge of engineering graphics in the field of dimensioning machine parts and determination of surface roughness, tolerance and fit.</p> | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | | 50.0% | 50.0% |
| | | 50.0% | 50.0% |
| Recommended reading | Basic literature | <p>[1] Wiesław Olszak: Obróbka skrawaniem - Wyd. 2. Wydawnictwa Naukowo-Techniczne, Warszawa, 2009.</p> <p>[2] Zenon Opiekun, Władysław Orłowicz, Feliks Stachowicz: Techniki wytwarzania - Wyd. 2, dodr. Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów, 2016.</p> <p>[3] Mieczysław Feld: Technologia budowy maszyn - Wyd. 3 zm. Wydaw. Naukowe PWN, Warszawa, 2000.</p> <p>[4] Mieczysław Korzyński: Inżynieria wytwarzania. Uniwersytet Rzeszowski, Katedra Mechatroniki i Automatyki, Rzeszów, 2013.</p> <p>[5] Tadeusz Dobrzański: Rysunek techniczny maszynowy. Wydawnictwo WNT, Warszawa, 2013.</p> <p>[6] Leszek Adam Dobrzański: Podstawy nauki o materiałach i metaloznawstwo: materiały inżynierskie z podstawami projektowania materiałowego. Wydawnictwa Naukowo Techniczne, Warszawa, 2002.</p> <p>[7] Edward Gawlik, Stanisław Gil, Krzysztof Zagórski: Projektowanie procesów technologicznych obróbki skrawaniem. Wydawnictwa AGH, Kraków, 2019.</p> <p>[8] Czesław Rzeźnik, Piotr Rybacki: Podstawy technologii maszyn. Wydawnictwo Uniwersytetu Przyrodniczego, Poznań, 2017.</p> <p>[9] Andrzej Klimpel: Technologie laserowe: spawanie, napawanie, stopowanie, obróbka cieplna i cięcie. Wydawnictwo Politechniki Śląskiej, Gliwice, 2012.</p> <p>[10] Przemysław Siemiński, Grzegorz Budzik: Techniki przyrostowe: druk drukarki 3D. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2015.</p> | |
| | Supplementary literature | <p>[1] Maria Porębska, Andrzej Skorupa: Połączenia spójnościowe - Wyd. 2 popr., dodr. 1. Wydawnictwo Naukowe PWN, Warszawa, 2013.</p> <p>[2] Wit Grzesik, Adam Ruszaj: Hybrydowe metody obróbki materiałów konstrukcyjnych. Wydawnictwo Naukowe PWN, Warszawa, 2021.</p> <p>[3] Krzysztof Jemieliński: Obróbka skrawaniem: podstawy, dynamika, diagnostyka. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2018.</p> | |
| | eResources addresses | Adresy na platformie eNauczanie: | |

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| <p>Example issues/ example questions/ tasks being completed</p> | <ol style="list-style-type: none"> 1. Drawing documentation 2. Locksmith work. 3. Cutting materials. 4. Machining - turning (lathe construction, tools). 5. Turning of end faces. 6. Turning cylindrical surfaces. 7. Turning cones. 8. Thread cutting. 9. Machining - milling (construction of a milling machine, tools). 10. Milling of flat surfaces, selection of cutters. 11. Milling keyways and pockets. 12. Grinding of flat and cylindrical surfaces. 13. Soldering. 14. Joining metals by welding. |
| <p>Work placement</p> | <p>Not applicable</p> |