



Subject card

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| Subject name and code | Nonmetali Materials, PG_00043718 | | | | | | | |
| Field of study | Transport and Logistics, Transport and Logistics | | | | | | | |
| Date of commencement of studies | October 2020 | | Academic year of realisation of subject | | | 2020/2021 | | |
| Education level | first-cycle studies | | Subject group | | | | | |
| Mode of study | Full-time studies | | Mode of delivery | | | at the university | | |
| Year of study | 1 | | Language of instruction | | | Polish | | |
| Semester of study | 1 | | ECTS credits | | | 1.0 | | |
| Learning profile | general academic profile | | Assessment form | | | assessment | | |
| Conducting unit | Department of Theory and Ship Design -> Faculty of Mechanical Engineering and Ship Technology | | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Lech Rowiński | | | | | |
| | Teachers | | dr hab. inż. Lech Rowiński | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM | |
| | Number of study hours | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 15 | |
| | E-learning hours included: 0.0 | | | | | | | |
| | Adresy na platformie eNauczanie: Materiały niemetalowe Transport i Logistyka - Moodle ID: 7529 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=7529 | | | | | | | |
| 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 | 15 | | | 2.0 | | 8.0 | 25 |
| Subject objectives | Provide knowledge with the basic knowledge regarding organic synthetic materials (plastics) that are utilized in machine and boat building as well as principles of selection of materials for structures, glues and surface coats supplemented with information regarding procurement of products. | | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | | Method of verification | | |
| | [K6_W03] has a basic knowledge on hydromechanics, thermodynamics, machine construction, ecology, materials science and electronics necessary to understand the construction and operation principles of means of marine transport | | The student knows principal plastics. The student knows basic data of synthetic materials. The student is able to describe the properties of synthetic materials; He knows basic technological processes He knows basic technological processes and its influence on the usable properties of synthetic materials, he distinguishes main composites categories. He knows the basic types resins and reinforcing materials used in boat building and reinforcing materials. The student knows the principles of creating polymer composites | | | [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 means and systems of transport | | Student is able to select plastic material for typical technical product basing on technical specification and technological properties or indicate properties of products manufactured of considered material | | | [SU2] Assessment of ability to analyse information | | |

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| Subject contents | Basic definitions and nomenclature (monomers and polymers); Review of non-metallic materials - natural and synthetic (cellulose, proteins, natural caoutchouc); Material characteristics for different application areas; Thermoplastics and elastomers. Mechanical and thermal properties of thermoplastics. Procurement of products using termoplastics. Duromers and their chemistry. Resins and reinforcements for marine application. Technological process of reinforced structures. Technological process of a large structural element of reinforced synthetic resin. | | |
| Prerequisites and co-requisites | Basic chemistry. Basic mechanical properties of materials | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Short test during every lesson | 60.0% | 100.0% |
| Recommended reading | Basic literature | 1.Dobrosz K., Matysiak A. ,Tworzywa sztuczne Warszawa WSZiP 1985 2.Kłosowska-Wołkowicz Z..Królikowski W., Penczek P..Żywiec i laminaty poliestrowe. Warszawa WNT 1980 3.Kozłowski J., Wilczopolski M..Materiałoznawstwo okrętowe czIII Okrętowe Tworzywa Polimerowe. Gdynia WSMW 1982 4.Królikowski W., Tworzywa wzmocnione i włókna wzmacniające, Warszawa WNT 1988 5.Żuchowska D., Polimery konstrukcyjne. Warszawa WNT 1995 | |
| | Supplementary literature | 1. Błędzki A.K. i inni: „Recykling materiałów polimerowych”, Wydawnictwa Naukowo Techniczne, Warszawa, 1997. 2. Composites World Journal https://gardnerweb.activehosted.com | |
| | eResources addresses | Materiały niemetalowe Transport i Logistyka - Moodle ID: 7529 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=7529 | |
| Example issues/ example questions/ tasks being completed | | | |
| Work placement | Not applicable | | |