



Subject card

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| Subject name and code | Strenght Optimization of thin-walled metal structures, PG_00057227 | | | | | | |
| Field of study | Ocean Engineering | | | | | | |
| Date of commencement of studies | February 2023 | Academic year of realisation of subject | | | 2023/2024 | | |
| 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 | | | 2.0 | | |
| Learning profile | general academic profile | Assessment form | | | exam | | |
| Conducting unit | Zakład Mechaniki Konstrukcji Oceanotechnicznych -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Tomasz Mikulski | | | | |
| | Teachers | | dr inż. Wojciech Puch dr hab. inż. Tomasz Mikulski | | | | |
| 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 | | | | | | |
| 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 | 10.0 | | 10.0 | 50 | |
| Subject objectives | The lecture objective is teaching of formulation and solution of optimal design of thin-walled metal structures. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K7_W06] has an organized, widened knowledge on engineering methods and design tools allowing the conducting of advanced projects within the construction and operation of ocean technology objects and systems | | The student is able to effectively numerically solve the problem of design optimization and evaluate the results obtained | | [SW3] Assessment of knowledge contained in written work and projects | | |
| | [K7_U07] in compliance with a formulated specification and with the aid of appropriate tools and methods, is able to complete an advanced engineering task within the range of design, construction and operation of ocean technology objects and systems | | The student is able to formulate the problem of thin-walled structure optimization and choose the right method for an effective solution | | [SU3] Assessment of ability to use knowledge gained from the subject | | |
| | [K7_W05] has an organized, widened knowledge on design, construction and operation of ocean technology objects and systems | | The student has ordered knowledge of optimization methods and sensitivity analysis of structures | | [SW1] Assessment of factual knowledge | | |
| Subject contents | <p>1) Formulating construction optimization problems; single or multi-criteria taking into account the problems of stability and dynamics of structures,</p> <p>2) Analytical, graphic and computer methods for solving problems of structure optimization,</p> <p>3) Sensitivity analysis, methods and applications</p> <p>3) Applications of optimal structure design for thin-walled metal structures</p> | | | | | | |

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| Prerequisites and co-requisites | Technical mechanics, Strength of materials, Ship structure mechanics | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Written test | 30.0% | 30.0% |
| | Computer laboratory | 50.0% | 70.0% |
| Recommended reading | Basic literature | 1) Szymczak C., Optimal Design Elements, PWN, 1998, (in Polish) 2) Brandt A.M., Criteria and Methods of Optimal Design, PWN, 1977, (in Polish) 3) Tarnowski W.: Fundamentals of Technical Design. Skrypt Wyższej Szkoły Inżynierskiej w Koszalinie, Koszalin 1989. | |
| | Supplementary literature | 1. Bochenek B., Kruzelecki J.: Optimal Stability Design of Structures, PK, 2007 (in Polish) 2. Arora J.S., Introduction to Optimal Design, Elsevier, 2004 | |
| | eResources addresses | | |
| Example issues/ example questions/ tasks being completed | - Optimal design of simple frames and trusses | | |
| Work placement | Not applicable | | |