

表 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

| Subject name and code | Mechanical Vibration Theory, PG_00044040 | | | | | | | | |
|--|--|---|--|------------------------------|--------|--|---------|-----|--|
| 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 | Part-time studies | | Mode of delivery | | | at the university | | | |
| Year of study | 2 | | Language of instruction | | | Polish | | | |
| Semester of study | 3 | | ECTS credits | | | 1.0 | | | |
| Learning profile | general academic profile | | Assessment form | | | assessment | | | |
| Conducting unit | Faculty of Ocean Engineering and Ship Technology | | | | | | | | |
| Name and surname | Subject supervisor | dr inż. Marek Kraskowski | | | | | | | |
| of lecturer (lecturers) | Teachers | | dr inż. Marek | Kraskowski | | | | | |
| Lesson types and methods | Lesson type | Lecture | Tutorial | Laboratory | Projec | t | Seminar | SUM | |
| of instruction | Number of study hours | 10.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 10 | |
| | E-learning hours included: 0.0 | | | | | | | | |
| | Adresy na platformie eNauczanie: Teoria drgań mechanicznych - oceanotechnika - Moodle ID: 19794 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19794 | | | | | | | | |
| Learning activity and number of study hours | Learning activity | arning activity Participation in classes include plan | | ed in study Participation in | | Self-study SUM | | | |
| | Number of study hours | 10 | | 2.0 | | 18.0 | | 30 | |
| Subject objectives | Knowledge of the basic problems of mechanical vibrations and solve them based on the laws of mechanics vibration. | | | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | | Method of verification | | | |
| | [K6_U02] can work individually and in a team, communicate through various techniques in professional environment and also record, analyse, and present the results of work, can estimate the time needed to complete a given task | | The student is able to use the standards and regulations of the Classification Societes and prepare appropriate documents for subordinates and for supervision. | | | [SU4] Assessment of ability to use methods and tools | | | |
| | [K6_W02] has a basic knowledge in physics, including technical mechanics, fluid mechanics, solid- state physics, optics and acoustics necessary to understand basic physical phenomena occurring in ocean technology | | The student has a basic knowledge of free vibrations and forced mechanical systems. He is aware of the danger of resonance and knows how to choose shock absorption devices for target machines avoid dangerous operating states. | | | [SW3] Assessment of knowledge contained in written work and projects | | | |
| Subject contents | Basic quantity and remarks. Viscous damping, dry friction damping, material and constructive damping. Logarithmic decrement, loss factors. Periodic and harmonic vibrations. Frequency and amplitude of vibrations. Free vibration of one-degree of freedom linear system. Critical damping. Vibration of one-degree of freedom linear system excited by harmonic force, harmonically moving support and rotating unbalance. Resonance phenomena and resonance curves. Vibration of two-degree freedom linear system. Dynamic damper. Vibration of linear system with many-degree of freedom. Matrix equation of motion. Frequency spectrum and vibration modes. Mechanical energy of vibrating system Rayleighs method. Principles of vibroisolation and shock absorption. Influences of mechanical vibrations on human body and environment. Standards. | | | | | | | | |

| Prerequisites and co-requisites | Knowledge of mathematics, physics, mechanics, strength of materials. | | | | | | |
|--|--|---|-------------------------------|--|--|--|--|
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade | | | | |
| | Final test | 60.0% | 100.0% | | | | |
| Recommended reading | Basic literature | Kruszewski J., Wittbrodt E., Walczyk Z.: Vibrations of Mechanical Systems on an Computer. Volume II. Selected Aspects. WNT, Warsaw, 1993. Szmelter J.: Computer Methods in Mechanics. PWN, Warsaw, 1980. Uhl T.: Computer-Aided Identification of Mechanical Engineering Models. WNT, Warsaw, 1997. Walczyk Z., Kicinski J.: The Dynamics of Power Turbines. Selected Aspects of Simple and Coupled Vibration. Publishing house of PG, Gdańsk, 2001. | | | | | |
| | Supplementary literature | Giergiel J.: Vibration of Mechanical Systems. Publishing house of AGH, Cracow, 1986. Cempel Cz: Fundamentals of Vibro-Acoustic Diagnostics of Machines. WNT, Warsaw, 1982. Kucharski T.: Mechanical Vibration. Solving Problems with Mathcad Program. WNT, Warsaw, 2004. Golinski J. A.: Vibration Isolation of Rotating Machinery. ARKADY, Warsaw, 1964. | | | | | |
| | eResources addresses | Teoria drgań mechanicznych - oceanotechnika - Moodle ID: 19794 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=19794 | | | | | |
| Example issues/ example questions/ tasks being completed | Dynamic balancing of rigid rotor. | | | | | | |
| Work placement | Not applicable | | | | | | |