

GDAŃSK UNIVERSITY

Subject card

Subject name and code	, PG_00056421								
Field of study	Ocean Engineering								
Date of commencement of studies	October 2022		Academic year of realisation of subject			2023/2024			
Education level	first-cycle studies		Subject group						
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			11.0	11.0		
Learning profile	general academic profile		Assessment form			exam			
Conducting unit	Faculty of Ocean Engineering and Ship Technology								
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Tomasz Mikulski							
	Teachers		dr hab. inż. Tomasz Mikulski						
			dr inż. Michał Krężelewski						
			mgr inż. Olga Kazimierska						
			mgr inż. Leszek Samson						
			dr inż. Jakub Kowalski						
			mgr inż. Paweł Bielski						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	60.0	45.0	15.0	0.0		0.0	120	
	E-learning hours included: 0.0								
	Additional information: Lectures, exercises and laboratories are conducted in the system of full-time education.								
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	120		15.0		140.0		275	
Subject objectives	 The aim of the course is to provide theoretical foundations of mechanics and strength regimes of one-dimensional structures (rods, beams). Student after the course should be able to: determine the distributions of internal forces and moments determine the stress distribution, calculate the displacements of one-dimensional structures, indicate the place of the greatest material effort at typical structure loads, calculate the effort of material using a variety of strength material hypothesis. 								

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 perform strength analyzes of elements of structural systems and ship devices.	[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				
	[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 acquired the ability to solve technical problems based on the laws of mechanics and basic material strength analysis.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge				
Subject contents	 Basics assumptions and description of the Strength of Materials problems. State of stress and strain: general state of stress and strains, plane stress and plane strain states. Physical relationships between stresses and strains. Hooke's law. Axial tension and compression of the rod. The internal forces. Statically determinate structures: beams , trusses and frames,frame-truss systems. Cross-sectional axial forces, shear forces, bending moments, torsional moments. Moments of inertia of plane figures. Bending of beams. Torsion of monolithic and thin-walled bars. Eccentric tension (compression) of the bar. Shear stresses in bending problems. Bending of beam. Euler's equation. Buckling of axially compressed rods. Strength hypothesises. Complex stress problems. Vibrations of a system with one degree of freedom: free and forced vibrations. The phenomenon of resonance, vibration damping. Introduction to vibrations of systems with many degrees of freedom. 						
Prerequisites and co-requisites	The student has passed the following subjects: - Technique Mechanic I						
Assessment methods and criteria	Subject passing criteria exercise laboratory exam	Passing threshold 50.0% 50.0% 50.0%	Percentage of the final grade 50.0% 20.0% 30.0%				
Recommended reading	Basic literature	 Hibbeler R.G.: Mechanics of materials, Prentice-Hall Int. Inc., 1994, ISBN 0-13-207028-6 Hibbeler R.G.: Statics and mechanics of materials, Prentice-Hall Int. Inc., ISBN 0023540915 Crayg Roy. R, Jr.: Mechanics of materials, John Willey & Sons, 1996, ISBN 0-471-50284-7 Beer F.P., Johnston E.R.: Mechanics of materials, Mc Graw-Hill Book Company, ISBN 0-07-004284-5 Ugural A.C., Fenster S.K.: Advanced Strength and Applied Elasticity, 1995, ISBN 0-13-137589-X Muvdi B.B., McNabb J.W.: Egineering Mechanics of Materials, Macmillan Publ. Comp. 1984, ISBN 0-02385770-6 Popov E. P.: Introduction to mechanics of solids, 1968, Prentice- Hall Int. Inc., Library of Congress Catalog Card Number 68-10135 Gould L. Ph.: Introduction to Linear Elasticity, Springer-Verlag, 1983, ISBN 0-387-90876-5 S. Graham Kelly, Mechanical Vibration: Theory and Applications, SI. Centage Learning, 2011. 					
	Supplementary literature no data available eResources addresses Adresy na platformie eNauczanie: Mechanika techniczna II, Oceanotechnika, zima 23/24 (PG_00056421) - Moodle ID: 33620 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33620						
Example issues/ example questions/ tasks being completed	What determines the critical force of the compressed rod?						
Work placement	Not applicable						