



## Subject card

Subject name and code	Mechanics of Ship Structures, PG_00060540						
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		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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		7.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Beata Zima				
	Teachers		dr hab. inż. Beata Zima  mgr inż. Paweł Bielski  mgr inż. Emil Roch				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	30.0	0.0	90
	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	90		9.0		76.0	175
Subject objectives	Student analyses internal forces in different types of the ship structures: frames, discs, plates and shells.  Student defines state of stresses in these elements.  Student estimates stability of the structure elements.  Student describes types of the vibration of the ship structures.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K03] is aware of the impact of non-technical aspects on the engineer's work and the impact of engineering activities on the natural environment	The student is able to describe the influence of mechanics on the formulated classification rules.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
	[K6_U06] in compliance with a formulated specification and with the aid of appropriate tools and methods, is able to complete a simple engineering task within the range of design, construction and operation of ocean technology objects and systems	The student acquired the ability to solve technical problems using knowledge of mechanics.	[SU3] Assessment of ability to use knowledge gained from the subject [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	The student is able to conduct the strength analyzes of the structural elements of ships or boats.	[SW1] Assessment of factual knowledge
	[K6_W02] has knowledge in the field of technical mechanics, fluid mechanics, strength of materials, necessary to understand the basic physical phenomena occurring in ocean engineering	The student is able to recognize the problem of mechanics that allows to assess the behavior of ship systems and devices.	[SW1] Assessment of factual knowledge
Subject contents	Classification of the structure elements. Statics of frames. Theory of discs, plates and shells. Stability - buckling modes and critical stresses. Finite Element Method - statics, stability and dynamics. Free and enforced vibration of ships and its elements.		
Prerequisites and co-requisites	Knowledge of the mechanics basis. Mathematics - differential and integral calculus.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	tests	25.0%	40.0%
	Lecture test	25.0%	40.0%
	reports	10.0%	20.0%
Recommended reading	Basic literature	Timoshenko, Woinowsky, Theory of plates and shells, 1961,  Timoshenko, Gere, Theory of elastic stability, 1961,  Dyląg, Jakubowicz, Strength of Materials, WNT, 1983	
	Supplementary literature	Zienkiewicz, Taylor, Finite Element Method Elsevier, 2005.	
	eResources addresses	Adresy na platformie eNauczanie: Mechanika konstrukcji okrętu - Moodle ID: 44398 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44398">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44398</a>	
Example issues/ example questions/ tasks being completed	Write the boundary conditions for simply supported plates.  What is the difference in terms of the internal forces state between plates and shells?		
Work placement	Not applicable		

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