



Subject card

Subject name and code	Mechanics of Ship Structures, PG_00046527						
Field of study	Ocean Engineering, Ocean Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group					
Mode of study	Part-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			6.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Ocean Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Bogdan Rozmarynowski					
	Teachers	mgr inż. Paweł Bielski dr hab. inż. Bogdan Rozmarynowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	20.0	20.0	10.0	0.0	0.0	50
	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	50	12.0		83.0		145
Subject objectives	Student learns methods of internal forces and stress analysis of ship structure elements and can apply its in numerical examples. Student should know methods of strength calculations and stability analysis of ship structure elements. Student learns basis of finite element method and its applications.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems	The student has the knowledge to use beam and plate strength models to solve the problem of the analysis of the structure of an ocean engineering facility.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K6_U05] can formulate a simple engineering task and its specification within the range of design, construction and operation of ocean technology objects and systems	The student is able to formulate and solve, directly and by trial and error method, a design problem of strength, buckling and natural vibrations of a rectangular plate.			[SU1] Assessment of task fulfillment [SU4] Assessment of ability to use methods and tools		
Subject contents	1. Classification of structure elements 2. Elements of theory of discs, plates and shells: rectangular disc, boundary conditions, internal forces, stress and strain states; rectangular plates, internal forces, stress and strain states, fundamental differential equation, boundary conditions; shells, internal forces, boundary conditions, stress state, methods of static analysis. 3. Ship structure elements interaction: effective width. 4. Stability: types of instability points; beams; plates. 5. Fundamentals of finite elements method: introduction; statics, rod systems, beams, plates and shells; stability; free and enforced harmonic vibrations. 6. Ship structure vibration: enforcements; shear and inertia effects.						
Prerequisites and co-requisites	Basic knowledge of strength of materials. Basic knowledge of finite element method.						
Assessment methods and criteria	Subject passing criteria	Passing threshold			Percentage of the final grade		
	Test	25.0%			40.0%		
	Lab reports	10.0%			20.0%		
	Lecture test	25.0%			40.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Z.Dyłał, A.Jakubowicz, Z.Orłóś: Wytrzymałość Materiałów, WNT, 1983. 2. S.P.Timoshenko, S.Woinowsky-Krieger: Teoria płyt i powłok, Arkady 1962. 3. S.P.Timoshenko, J.M.Gere: Teoria stateczności sprężystej, Arkady, 1963. 4. Z.Kacprzyk, G.Rakowski: Metoda Elementów Skończonych, Politechnika Warszawska, 2005.
	Supplementary literature	The Instruction of program RARUS (in Polish).
	eResources addresses	<p>Adresy na platformie eNauczanie:</p> <p>Mechanika Konstrukcji Okrętu, I stop., Sn, [W], [BR], 2022/2023, (O: 098210n) - Moodle ID: 25444</p> <p>https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25444</p>
Example issues/ example questions/ tasks being completed	<p>The strength calculation of the bottom using the model of beam on elastic foundation.</p> <p>The strength calculations of the shell plating of the watertight bulkhead.</p>	
Work placement	Not applicable	