



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 known 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 fulfilment [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	1. Z.Dyła, A.Jakubowicz, Z.Orłoś: 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	Adresy na platformie eNauczanie: Mechanika Konstrukcji Okrętu, I stop., Sn, [W], [BR], 2022/2023, (O: 098210n) - Moodle ID: 25444 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25444
Example issues/ example questions/ tasks being completed	The strength calculation of the bottom using the model of beam on elastic foundation. The strength calculations of the shell plating of the watertight bulkhead.	
Work placement	Not applicable	