

表 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Fluid Mechanics, PG_00044041								
Field of study	Ocean Engineering, Ocean Engineering								
Date of commencement of studies	October 2020		Academic year of realisation of subject			2021/	2021/2022		
Education level	first-cycle studies		Subject group			field c Subje	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 de	eliverv		at the	at the university		
Year of study	2		Language of instruction		Polish	Polish			
Semester of study	3		ECTS credits		2.0				
Learning profile	general academic pro	ofile	Assessmer	Assessment form		asses	sment		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology				nd Ship				
Name and surname	Subject supervisor		dr inż. Michał Krężelewski						
of lecturer (lecturers)	Teachers		dr inż. Michał	Krężelewski					
		mgr inż. Olga	i Kazimierska						
Lesson types and methods	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
of instruction	Number of study hours	10.0	10.0	0.0	0.0		0.0	20	
	E-learning hours included: 0.0								
	Adresy na platformie eNauczanie:								
Learning activity and number of study hours	Learning activity	Participation in classes includ plan				Self-study SUM		SUM	
	Number of study 20 hours			4.0		26.0		50	
Subject objectives	o familiarize students - density, viscosity, co - Static equilibrium ec - Continuity equation, - The principle of mor - Calculation of hydro - The principle of con - Basic issues of visco - The concept of the s	pressibility, s quations of fluid nentum conser dynamic forces servation of en ous liquid flow, stress tensor in	surface tension hydrostatic pr vation, s, ergy for non-vis determination a real (viscous	n, ressure, fluid fo scous fluid, inc of losses in the s) fluid.	orces or ompres	n straigh	nt surfaces, e ow (Bernoulli	eq.)	
Learning outcomes	Course outcome		Subject outcome		Method of verification				
			The student is able to solve simple tasks in the field of fluid mechanics (fluid statics, 1D flows of perfect and real liquid). He can estimate the time and resources to solve the task		[SU1] Assessment of task fulfilment				
[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					[SW3] Assessment of knowledge contained in written work and projects				

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- Faricle fluid - The pressure, shear stress, if the construction of the phytostatic pressure formula. - The hydrostatic pressure formula. - Pressure force to the fast surface of the construction. - Buoyanov, centre of buoyanov. - Calculation of the moment of pressure formula. - Buoyanov, centre of buoyanov. - Calculation of the moment of pressure formula. - Buoyanov, centre of buoyanov. - Stability of the moment of pressure formula. - Buoyanov, centre of buoyanov. - Stability of the moment of pressure formula. - Buoyanov, centre of buoyanov. - Stability of the moment of pressure formula. - Buoyanov, centre of buoyanov. - Stability of the moleco of thuids: - Equilation continue. - Equilation continue. - Equilation continue. - A description of the moleco of thuids: - Determinition of postion, velocity and acceleration of the fluid. - The principe of conservation of mass (continutly equilation): - Calculation of hydrodynamic fluids. - Calculation of hydrodynamic fluids. - The concept of the stress tension in a real/viscoush fluid. - Calculation of hydrodynamic fluids. - Determining the amount of local loss and linear: - The amount of local loss and linear: - Types of flow of real hubbit: - The amount of local loss and linear: - Types of flow of real hubbit:			ility, surface tension,					
- The pressure ; there stress, :		Basic concepts:						
Place is law. Place is law. In the hydrotable equation equations of fluid - The spreame force in the fast surface - The concept of the center of pressure force. - Calculation of the moment of pressure force. - Burynary careful of burynery. - Metacentric neight. - He concept of the center of pressure force. - Surgitizes - He concept of the center of pressure force. - Surgitizes - Metacentric neight. - He concept of the path of the fluid predicts (pathine), streamline, streamsurface, streamsurface, streamsurface. - Lagrangian method - Calculation of the fluid predicts (pathine), streamline, streamsurface, streamsurface, streamsurface. - The concept of the path of the fluid predicts (pathine), streamline, streamsurface,								
Fluid static:								
Pre-Pressure force to the first stratee - The concept of the centre of pressure force. - The concept of the centre of pressure force. - Stability of floating bodies (ships) - Metaceninic neight. - Metaceninic neight. - The concept of the motion of fluids: - Learning neight. - Learning neight. - Metaceninic neight. - Metaceninic neight. - A description of the motion of fluids: - Lagrangian method. - Lagrangian method. - The concept of the mass flow rate the volumetric flow rates. - The concept of the flow volcicity at varying cross channel - The principle of conservation of momentum. - The concept of the most own rate the volumetric flow volcicity at varying cross channel - Calculation of the most own rate waying cross channel - The concept of the real fluid flow, develop varying cross channel - The concept of the real fluid flow, develop varying cross channel - The concept of the real fluid flow, develop varying cross channel - The concept of the real fluid flow, develop varying cross channel - Concerdized Bernouli equaliton. - Determinition of the value. - The concept of the partic cross. - Determinition of the v								
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- Metacentric radius, - Metacentric radius, - Equilibrium conditions, - Equiping an endot - Equipage of function of hubbs: - Eulerian method, - Eulerian method, - Determination of position, velocity and acceleration of the fluid, - Determination of position, velocity and acceleration of the fluid, - Determination of position, velocity and acceleration of the fluid, - Determination of position, velocity and acceleration of the fluid, - Determination of conservation of mass (continuity equation); - Action particular of the mass flow rate fluid particles (califine), streamlue, streamsurface, streamtube The principle of conservation of mass (continuity equation); - Calculation of the flow velocity at varying cross channel The principle of conservation of momentum, - The concept of the real fluid flow, determination of the flow rate and pressure. The principle of conservation of momentum, - The concept of the real fluid flow, determination of loss in the flow: - Generalized Bernoulli equation, - Generalized Bernoulli equation, - Determining the amount of local loss and linear: - Types of flow of real huid flow, Turbulent flow,		Buoyancy, center of buoyancy.						
- Metacontric height, - Adescription or offluids (Amenatics: - Adescription of the motion of fluids:		- Stability of floating bodies (ships)						
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Recommended reading	Basic literature	 Teoria (wykład): [1] R. Puzyrewski, J. Sawicki: Podstawy mechaniki płynów i hydrauliki. Wydawnictwo Naukowe PWN, Warszawa 2000 [2] R. Gryboś: Podstawy mechaniki płynów. Wydawnictwo Naukowe PWN, Warszawa 1998 Zadania (ćwiczenia): [3] R. Gryboś: Zbiór zadań z technicznej mechaniki płynów. Wydawnictwo Naukowe PWN, Warszawa 2002 [4] E.S. Burka: Mechanika Płynów w Przykładach. Wydawnictwo Naukowe Naukowe PWN, Warszawa 1994
	Supplementary literature	 5] Bar-Meir, Genick, Basics of Fluid Mechanics, Last modified: Version 0.3.4.0 March 17, 2013, www.potto.org/downloads.php [6] Yunus A. Çengel, John M. Cimbala: Fluid Mechanics. Fundamentals and Applications. McGraw Hill Higher Education, Boston, 2006 [7] W.J. Prosnak: Mechanika Płynów (Tom I). Państwowe Wydawnictwo Naukowe, Warszawa 1970. [8] J. Bukowski: Mechanika Płynów. Państwowe Wydawnictwo Naukowe, Warszawa 1959.
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Work placement	Not applicable	