



## Subject card

Subject name and code	Mechanical Vibration Theory, PG_00044046						
Field of study	Ocean Engineering, Ocean Engineering						
Date of commencement of studies	October 2020		Academic year of realisation of subject		2021/2022		
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		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Hydromechanics and Hydroacoustics -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Krężelewski				
	Teachers		dr inż. Michał Krężelewski				
			dr inż. Marek Kraskowski				
			mgr inż. Olga Kazimierska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie:						
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	30		2.0		13.0	45
Subject objectives	Knowledge of the basic problems of mechanical vibrations and solve them based on the laws of mechanics vibration.						
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		Formulates basic problems vibration mechanics.		[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		Applies laws and methods of mechanics vibration.		[SW1] Assessment of factual knowledge		
Subject contents	Basic quantity and remarks. Viscous damping, dry friction damping, material and constructive damping. Logarithmic decrement, loss factors. Periodic and harmonic vibrations. Frequency and amplitude of vibrations. Free vibration of one-degree of freedom linear system. Critical damping. Vibration of one-degree of freedom linear system excited by harmonic force, harmonically moving support and rotating unbalance. Resonance phenomena and resonance curves. Vibration of two-degree of freedom linear system. Dynamic damper. Vibration of linear system with many-degree of freedom. Matrix equation of motion. Frequency spectrum and vibration modes. Mechanical energy of vibrating system – Rayleigh's method. Principles of vibroisolation and shock absorption. Influences of mechanical vibrations on human body and environmental. Standards.						

Prerequisites and co-requisites	Student passed following subjects: – Technical mechanics I – Technical mechanics II – Strength of materials		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Midterm colloquium	50.0%	100.0%
Recommended reading	Basic literature	1. Thomson W.T.: Vibration theory and applications, Prentice-Hall Int. Inc., ISBN 013651068X 2. Thureau P., Lecler D.: An introduction to the principles of vibration of linear systems, John Wiley@sons, ISBN 0-470-27230-9 3. Kelly G.: Fundamentals of mechanical vibrations, McGraw-Hill Publ. Comp., ISBN 0-07-911533-0	
	Supplementary literature	None	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Mechanical vibration, vibration damped, forced vibration		
Work placement	Not applicable		