



## Subject card

Subject name and code	, PG_00056318						
Field of study	Ocean Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
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	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Lech Rowiński				
	Teachers		dr hab. inż. Lech Rowiński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	15.0	45
	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	45		5.0		25.0	75
Subject objectives	The aim of the course is to develop students' skills and knowledge of the principles of functioning and operation of systems for tracking the position of floating objects and monitoring the technical condition of the ship and its systems.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of ocean technology objects and systems		The student has structured knowledge about: - the purposes of monitoring the position and technical condition of the ship and its systems,, - ship parameters and variables to be monitored, - devices and methods of monitoring the selected vessel variables and its systems, - essential ship monitoring requirements and related standards.		[SW2] Assessment of knowledge contained in presentation		
	[K6_W05] has an organized knowledge on design, construction and operation of ocean technology objects and systems		The student has structured knowledge in respect to conceptual design and operation of systems and devices used for monitoring the position of vessels, as well as the technical condition of ship systems.		[SW1] Assessment of factual knowledge		
	[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 a simple engineering task and its specification in the field of design and operation of systems and devices for monitoring the position of floating objects and the technical condition of ship systems used on shipboard.		[SU2] Assessment of ability to analyse information		

Subject contents	<p>1. Introduction, general objectives and scope of ship monitoring, basic concepts</p> <p>2. Standards and requirements for ship monitoring</p> <p>4. Sensors applied in ship monitoring systems</p> <p>3. Ship tracking and monitoring systems, incl. AIS and VMS:</p> <ul style="list-style-type: none"> <li>• purpose and scope</li> <li>• system parameters and variables,</li> <li>• tools and equipment,</li> <li>• methods and existing layout.</li> </ul> <p>4. Systems for monitoring the technical condition of the ship's hull and structure:</p> <ul style="list-style-type: none"> <li>• purpose and scope</li> <li>• system parameters and variables,</li> <li>• tools and equipment,</li> <li>• methods and existing layout.</li> </ul> <p>5. Systems for monitoring the technical condition of the ship's propulsion system and power plant</p> <ul style="list-style-type: none"> <li>• purpose and scope</li> <li>• system parameters and variables,</li> <li>• tools and equipment,</li> <li>• methods and existing layout.</li> </ul> <p>6. Systems of data acquisition, managing and transferring</p>		
Prerequisites and co-requisites	<ul style="list-style-type: none"> <li>• Fundamentals of automatics</li> </ul>		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Participation and activities	5.0%	4.7%
	Final colloquium	56.0%	95.3%
Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Ship and Mobile Offshore Unit Automation: A Practical Guide, Henryk Peplinski, Elsevier Science &amp; Technology, 2019.</li> <li>2. Dokumenty projektu "Stałe monitorowanie bezpieczeństwa statków na morzu" (Detection of safety critical cracks and corrosion in ships using novel sensors and systems based on ultrasonic linear phased array technology) - SHIP INSPECTOR (<a href="https://cordis.europa.eu/article/id/92405-continuous-monitoring-of-ship-safety-at-sea/pl">https://cordis.europa.eu/article/id/92405-continuous-monitoring-of-ship-safety-at-sea/pl</a>)</li> <li>3. Dokumenty projektu INCASS: Ship Sensors Data Collection &amp; Analysis for Condition Monitoring of Ship Structures &amp; Machinery Systems, January 2016, DOI: <a href="https://doi.org/10.3940/rina.sst.2016.13">10.3940/rina.sst.2016.13</a>, At: London, UK, (<a href="https://www.incass.org.uk/">INCASS</a>)</li> <li>4. Iraklis Lazakis, Konstantinos Dikis, Anna Lito Michala, Gerasimos Theotokatos, Advanced Ship Systems Condition Monitoring for Enhanced Inspection, Maintenance and Decision Making in Ship Operations, Transportation Research Procedia, Volume 14, 2016, Pages 1679-1688, ISSN 2352-1465, <a href="https://doi.org/10.1016/j.trpro.2016.05.133">https://doi.org/10.1016/j.trpro.2016.05.133</a> (<a href="https://www.sciencedirect.com/science/article/pii/S235214651630134X">https://www.sciencedirect.com/science/article/pii/S235214651630134X</a>)</li> </ol>	
	Supplementary literature	<ol style="list-style-type: none"> <li>1. IMO, International Safety Management (ISM) code, Resolution A. 741, 1993</li> <li>2. BS/ISO 13379-1, Condition monitoring and diagnostics of machines - Data interpretation and diagnostics techniques Part 1: General guidelines, BSI Standards Publication, 2012</li> <li>3. EC 2009. Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 (Common Rules and Standards for Ship Inspection and Survey Organisations), Official Journal of the European Union.</li> <li>4. PINTELON, L. &amp; PARODI-HERZ, A., Maintenance: An Evolutionary Perspective. Complex System Maintenance Handbook, 2008</li> </ol>	
	eResources addresses	Adresy na platformie eNauczanie:	

Example issues/ example questions/ tasks being completed	.
Work placement	Not applicable