



## Subject card

|   |  |  |   |                                     |   |            |     |
|---|--|--|---|-------------------------------------|---|------------|-----|
| Subject name and code                       | , PG_00056318  |  |   |                                     |   |            |     |
| Field of study                              | Ocean Engineering  |  |   |                                     |   |            |     |
| Date of commencement of studies             | October 2022   |  | Academic year of realisation of subject   |                                     | 2024/2025   |            |     |
| Education level                             | first-cycle studies  |  | Subject group   |                                     |   |            |     |
| 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   |  |   |                                     |   |            |     |
| 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_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      |            |     |
|   | [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_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:<br>- the purposes of monitoring the position and technical condition of the ship and its systems,,<br>- ship parameters and variables to be monitored,<br>- devices and methods of monitoring the selected vessel variables and its systems,<br>- essential ship monitoring requirements and related standards. |                                     | [SW2] Assessment of knowledge contained in presentation |            |     |

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|---------------------------------|---|--|-------------------------------|
| 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 |
|                                 | Final colloquium  | 56.0%  | 95.3%                         |
|                                 | Participation and activities  | 5.0%   | 4.7%                          |
| 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, (INCASS)</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:   |                               |

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| Example issues/<br>example questions/<br>tasks being completed | .              |
| Work placement   | Not applicable |