

# The Hong Kong Polytechnic University

## Subject Description Form

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| <b>Subject Code</b>                                    | LGT3022   |
| <b>Subject Title</b>                                   | Marine Navigation and Meteorology   |
| <b>Credit Value</b>                                    | 3   |
| <b>Level</b>   | 3   |
| <b>Normal Duration</b>                                 | 1-semester  |
| <b>Pre-requisite /<br/>Co-requisite/<br/>Exclusion</b> | Nil   |
| <b>Objectives</b>                                      | This subject provides students with basic understanding of meteorology and navigation at sea in order to develop their foundation knowledge for studying high-level courses related to maritime transportation. This subject also raises students' awareness on the importance of quality personnel and proper use of modern technologies to maritime safety management.  |
| <b>Subject Learning<br/>Outcomes</b>                   | <p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> <li>a. Identify and inter-relate the various physical principles which determine the conduct of maritime transportation.</li> <li>b. Assess all possible limitations which may be imposed by the internal and external environments within which ships and ports operate.</li> <li>c. Evaluate navigational/meteorological information for directing the safe navigation of a ship.</li> <li>d. Recommend solutions to minimising potential risks that arise from the dynamic maritime environment surrounding a ship.</li> <li>e. Appraise the need for adopting weather routing services and using it to determine the optimum route for a voyage.</li> <li>f. Master the basic techniques of applying conventional position fixing principles and assess the impact of associated modern technologies on safety of maritime transportation.</li> </ol> <p>Studying this subject will also help develop students' skills in critical thinking and arouse their interest in life-long learning to keep abreast of modern marine technology, and enhance their awareness of social responsibility in maritime safety.</p> |
| <b>Subject Synopsis/<br/>Indicative Syllabus</b>       | Principles of position finding, position monitoring and vessel orientation, methods and instrumentation used in practice; the procedures applicable to ocean and coastal navigation; the use of navigational instrumentation; data sources and usage; track keeping, accuracies and errors. Applications in port approach and harbour surveys; Global and local atmospheric and ocean dynamics. The characteristics of climatic and weather systems; Meteorological and oceanographic factors affecting shipping and the instrumentation for their assessment. Occurrence and effect of natural phenomena upon trade and  |

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|  | shipping. Winds, currents and tides and their effect on shipping and transport. Climate, seasons and seasonal hazards such as typhoons and ice. The use of weather routing services.  |             |  |   |   |   |                 |   |
| <b>Teaching/Learning Methodology</b>                                   | Lectures will be used to present the basic technical material and illustrate its use. Tutorials will be used for problem classes where students can check their solutions to exercises and resolve problems with their understanding of the topics. Students will be motivated to broaden their knowledge and to deepen their understanding of some selected topics through problem-based learning activities.  |             |  |   |   |   |                 |   |
| <b>Assessment Methods in Alignment with Intended Learning Outcomes</b> | Specific assessment methods/tasks   | % weighting | Intended subject learning outcomes to be assessed (Please tick as appropriate) |   |   |   |                 |   |
|  |   |             | a  | b | c | d | e               | f |
|  | <b>Coursework</b>   | 40%         |  | ✓ | ✓ | ✓ |                 |   |
|  | <b>Examination</b>  | 60%         | ✓  |   | ✓ |   | ✓               | ✓ |
|  | <b>Total</b>  | 100 %       |  |   |   |   |                 |   |
|  | <p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Assignment and/or written test can be designed to test students' ability to apply common senses and technical knowledge in evaluation of relevant information and to provide recommendations for safe voyage of a ship. These methods of assessment can facilitate measurement of the learning outcomes (b), (c) and (d).</p> <p>Written examination is an assessment method appropriate for testing students' understanding of concepts relating to certain technical requirements, acquaintance with the practices / principles of solving technical problems in weather routing and marine navigation. Written examination can be designed to measure the learning outcomes (a), (c), (e) and (f).</p> |             |  |   |   |   |                 |   |
| <b>Student Study Effort Expected</b>                                   | Class contact:  |             |  |   |   |   |                 |   |
|  | ▪ Lecture   |             |  |   |   |   | 26 Hrs.         |   |
|  | ▪ Tutorial  |             |  |   |   |   | 13 Hrs.         |   |
|  | Other student study effort:   |             |  |   |   |   |                 |   |
|  | ▪ Self-study / research for self-learning tasks   |             |  |   |   |   | 40 to 59 Hrs.   |   |
|  | ▪ Assignment / preparation for examination / test   |             |  |   |   |   | 28 to 35 Hrs.   |   |
|  | Total student study effort  |             |  |   |   |   | 107 to 133 Hrs. |   |
| <b>Reading List and References</b>                                     | Frost, A. (2016), <i>Practical Navigation for Officers of the Watch 2<sup>nd</sup> Edition (eBook)</i> , Witherby Seamanship International. <a href="https://www.bookharbour.com/practical-navigation-for-officers-of-the-watch">https://www.bookharbour.com/practical-navigation-for-officers-of-the-watch</a>   |             |  |   |   |   |                 |   |

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|  | <p>Royal Navy. (2019), <i>The Admiralty Manual of Navigation. Volume 1: Principles of Navigation</i>, London: The Nautical Institute</p> <p>Royal Navy.(2018), <i>Admiralty Manual of Navigation. Volume 2, Astro Navigation</i>, London: The Nautical Institute</p> <p>Dutton, B. (2004), <i>Dutton's Nautical Navigation</i>, Annapolis, Md. : Naval Institute Press</p> <p>National Geospatial-intelligence Agency. (2019), <i>The American Practical Navigator: Bowditch</i>, Skyhorse Publishing</p> <p>Kemp, J.F. (latest edition), <i>Notes on Compass Work</i>, London: Butterworth-Heinemann,</p> <p>Bole, A.G. et al. (latest edition), <i>The Navigation Control Manual</i>, London: Heinemann.</p> <p>NP100, <i>The Mariner's Handbook</i> (2020), The UK Hydrographic Office</p> <p>IMO (2019), <i>Ships' Routeing</i>, London: International Maritime Organization</p> <p>Cornish, M. M. and Ives, E. E. (2019), <i>Reeds Maritime Meteorology</i>, Adlard Coles Nautical</p> <p>Ingham, A.E. (latest edition), <i>Hydrography for the Surveyor &amp; Engineer</i>, 3rd Ed., London: Blackwell Scientific Publications</p> <p>Weinrit, A. and Neumann T. (Eds.) (2020), <i>Marine Navigation and Safety of Sea Transportation: Maritime Transport &amp; Shipping</i>, London: CRC Press</p> <p>Kristiansen, S. (2005), <i>Maritime Transportation: Safety Management and Risk Analysis</i>, Elsevier Butterworth Heinemann</p> <p>Whitney, C. A. and Wright, F. W. (latest edition), <i>Learn to Navigate by the Tutorial System Developed at Harvard</i>, Cornell Maritime Press</p> <p>IMO (2020), <i>Performance Standards for Shipborne Radiocommunications and Navigational Equipment</i>, London: International Maritime Organization</p> <p><i>Passage Planning Guide: Straits of Malacca and Singapore (Soms)</i>, (2021), Edinburgh, Scotland UK: Witherby Seamanship International.</p> <p>UKHO (2021), <i>China Sea Pilot. Vol 1, The west side of South China Sea from Tanjung Lompat on the eastern side of Peninsular Malaysia to Zhelang Yan in China ; Pulau-Pulau Anambas, Hainan Dao, and the islands and banks bordering the main route from Singapore Strait to Hong Kong</i>, Somerset: United Kingdom Hydrographic Office</p> <p>SEAVIEW, <a href="http://www.seatransport.org">http://www.seatransport.org</a></p> |
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