The Hong Kong Polytechnic University

Subject Description Form

Subject Code	LGT3504
Subject Title	Navigation and Shipboard Communication
Credit Value	3
Level	3
Normal Duration	1-semester
Pre-requisite / Co-requisite/ Exclusion	Nil
Role and Purposes	The role of this subject is to provide students with a broad knowledge in navigation and communication systems that enable them to appreciate the latest technologies that are applied to the effective management of a vessel.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Understand the functions of navigation and communication systems that are essential to safety of life at sea (SOLAS). b. Compare the performance of navigation and communication systems with the international standards of SOLAS to identify possible deficiencies that require due attention and recommendations for improvements. c. Apply appropriate operational standards for effective management of a vessel and assurance of maritime safety. Studying this subject will also help develop students' skills in life-long learning about modern navigation/communication technologies, and enhance students' awareness of social responsibility in maritime safety.
Subject Synopsis/ Indicative Syllabus	Basic principles of radio communication; principles of hyperbolic position fixing systems; concept of digital technology; principles of satellite orbits and use in the maritime context; satellite position-fixing systems. General concept of Global Maritime Distress and Safety System (GMDSS); procedures of distress, search and rescue; basic principles and operational knowledge of all mandatory GMDSS equipment – DSC, EPIRB, SART, Inmarsat, Navtex, and radiotelex; reserve power systems; use of relevant publications, including International Code of Signals; visual signaling. Shipboard Radar and Electronic Charting Systems: System design, functions, limitations and characteristics; Automatic Identification System; Automatic Radar Plotting Aids; applications for collision avoidance and navigation; elements of safe navigational watch; blind pilotage techniques; ship reporting systems and VTS procedures; navigation using ECDIS.

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<tr><td></td><td>Shipboard inventory system: applications of information technology in ship provisioning/ stores and spares.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Lectures will be used to introduce to students the concepts, principles, theories, application issues and descriptive cases for the topics. Different teaching materials will be used to cover the most updated development and applications of shipboard navigation and communication systems. Laboratories will be used to provide students with hands-on practice with the aids of marine simulator and GMDSS simulator.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td></td><td></td><td></td></tr>
<tr><td>Coursework</td><td>40%</td><td>✓</td><td></td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>Examination</td><td>60%</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="6"></td></tr>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
Weekly laboratory tasks, practical test, and written examination are the typical assessment methods used in this subject. The tasks of laboratory ensure students to acquire essential practical skills through adequate amount of hands-on practice. The process of acquiring the skills provides students with the opportunity to understand the functions of navigation and communication systems relevant to safety of life at sea. This is to measure the learning outcome (a). With the achievement on the learning outcome (a), students should be familiar with relevant operational requirements to a large extent. Practical test can assess students' knowledge in applying appropriate operational procedures of using communication and navigation systems in some typical scenarios to meet a certain requirements of effective ship management and maritime safety assurance. This is to measure partly the learning outcome (c).
Written examination can allow students to demonstrate their abilities of understanding the functions of some selected systems; allow me to test students' abilities of comparing the performance of relevant systems with the international standards and identifying possible deficiencies in a hypothetical case; and allow students to describe application of relevant standard communication / navigation procedures in some hypothetical cases that require safeguarding maritime safety. Both written examination and coursework can serve to measure the learning outcomes (a), (b) & (c) but they may have emphasis on different areas.
To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.
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Student Study Effort Expected	Class contact:	
	▪ Lecture	26 Hrs.
	▪ Laboratory	20 Hrs.
	Other student study effort:	
	▪ Self study / research for self-learning tasks	35 to 58 Hrs.
	▪ Self practice for practical tests / preparation for examination	25 to 35 Hrs.
	Total student study effort	107 to 140 Hrs.
Reading List and References	***References***	

Bréhaut, D. (2013), *GMDSS - A User's Handbook,* Adlard Coles Nautical

Lees, G.D. (2015), *Handbook for Marine Radio Communication*, Abingdon, Oxon : Informa Law from Routledge

IMO (2013), *GMDSS manual: manual on the global maritime distress and safety system,* London

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Waugh, I. (2007), *The Mariners Guide To Marine Communications*, London: The Nautical Institute

Monroe, J.W. and Bushy, T.L. (1998), *Marine Radionavigation and Communications*, Cornell Maritime Press

Wall, A., Bole A.G. and Dineley W.O. (2014), *Radar and ARPA Manual,* Oxford: Butterworth-Heinemann.

Bowditch, N. (2002), *American Practical Navigator*, Washington, US Hydrographic Office.

Bagshaw, I.W. (2001), *Worked Examples in Relative Radar Plotting*, Brown, Son & Ferguson

Tetley, L. and Calcutt, D.M. (2001), *Electronic Navigation Systems*, Oxford: Butterworth-Heinemann.

Gale, H. (2009), *From Paper Charts to ECDIS: A Practical Voyage Plan*, London: The Nautical Institute

Weintrit, A. (ed.) (2009), *Marine Navigation and Safety of Sea Transportation*, London: CRC Press

Weintrit, A. (2009), *The Electronic Chart Display and Information System (ECDIS) – An Operational Handbook*, Leiden: CRC Press/Balkema

Norris, A. (2008), *Integrating ship bridge systems. Volume 1, Radar and AIS : A Practical Guide*, London: The Nautical Institute

Norris, A. (2010), *Integrated bridge systems. Volume 2, ECDIS and Positioning,* London: The Nautical Institute

	Dokkum, Klaas van (2007), *Ship Sailing Rules*, Enkhuizen: Dokmar Cockcroft, A..N. (2012), *A guide to the collision avoidance rules: International Regulations for Preventing Collisions at Sea*, Boston: Elsevier Power, T. (2004), *Best Practice in Shipmanagement Software*, Digital Ship, London IMO (2008), *Performance Standards for Shipborne Radiocommunications and Navigational Equipment*, London: International Maritime Organization. NIMA (latest edition), *International Code of Signals*, Maryland: National Imagery and Mapping Agency *SEAVIEW*, http://www.seatransport.org