The Hong Kong Polytechnic University

Subject Description Form

Subject Code	LGT4010
Subject Title	Stability, Stress and Loadlines
Credit Value	3
Level	4
Normal Duration	1-semester
Pre-requisite / Co-requisite/ Exclusion	Nil
Role and Purposes	This subject introduces students to the fundamental principles of ship stability and strengths. It provides students with a full knowledge of stresses on ships' structure. It also introduces students to the concepts of loadlines and principles of its assignment. **(Outcome 11)**
Subject Learning Outcomes	Upon completion of the subject, students will be able to: a. Solve stability and integrity problems of ships; Support and effect safety management and operations of ships; b. Evaluate a ship's stability; Plan a full ship load; and c. Recommend suitable securing plans for special cargoes.
Subject Synopsis/ Indicative Syllabus	Ship geometry; form coefficients of ships; transverse and longitudinal stability; dynamical stability; concepts of anti-roll devices; damaged condition stability, bilging and permeability; principles of inclining experiment; effect of freeboard and beam on stability; intact stability of advanced marine vehicles; drydocking and grounding; special cargo, wind and wave excitation factors in stability; principles of cargo securing; stresses on cargo securing systems; effect of change of density; use of hydrostatic curves; use of stability booklets and loading manuals; international conventions, codes and national regulations; regulatory requirement on stability; conditions of loadlines assignment; liquid pressure and thrust; stresses on a ship's structure; bending and shear stresses; planning of cargo operations to minimise stress and bending moments.
Teaching/Learning Methodology	In the lectures, the general principles of topics will be presented and developed. In the tutorials, students will develop and apply the general principles of the topic in student-centred activities.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c			
1. Coursework	50%	✓	✓	✓			
2. Examination	50%	✓	✓	✓			
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

The assessments of coursework and examination are adequately used to reflect the understanding of the legal and practical issues in the subject areas.

To pass this subject, students are required to obtain Grade D or above in BOTH the Continuous Assessment and Exam components.

Student Study Effort Expected

Class contact:	
▪ Lecture	26 Hrs.
▪ Tutorial	13 Hrs.
Other student study effort:	
▪ Self Study	87 Hrs.
Total student study effort	126 Hrs.

Reading List and References

<u>Recommended reading</u>

Relevant treaties to date

Clark, I.C. (2002), *The management of merchant ship stability, trim and strength: a guide to the theory, rules and calculations carried out to ensure that a vessel maintains seaworthy stability and trim whilst remaining within its limits of strength*, London: Nautical Institute.

Derrett D.R. (1999), *Ship Stability*, London: Heinemann.

Isbester J. (1993), *Bulk Carrier Practice*, London: Nautical Institute London.

Kemp, J. F. (2001), *Ship Stability Notes and Examples*, Oxford: Butterworth-Heinemann.

Lester A.R. (1985), *Merchant Ship Stability*, London: Butterworths.

Rawson, K.J. (2001), *Basic Ship Theory*, Boston: Butterworth-Heinemann.