

ABOUT THE COURSE

The primary objective of this short course is to provide conversion or refresher training for science and engineering graduates and experienced draughtsmen who hold active line responsibilities in the design of ships and ship systems and in shipbuilding practice. The course is designed in such a way that at the end of the lectures, the person will have a very broad understanding of the behaviour of ships under a variety of loading and operating conditions. The syllabus will include: basic definitions of ships, structural components of the hull girder, general arrangement, ship as functional blocks, intact and damaged stability, resistance and propulsion methods, seakeeping, manoeuvring and structural response. The course is intended for practising engineers and research scientists who need to understand the concepts behind the behaviour of ships & ships system at sea.

WHO SHOULD ATTEND

Engineers and scientists involved in the design of ships and ship systems. Personnel from ship management companies, oil companies, classification societies and shipbuilders will benefit from attending this course. The course is innovative in both content & structure with a careful balance of theory & practice.

COST

The registration fee of the workshop will be £595 includes course notes.

COURSE MATERIAL

The lecture notes will be sent in advance

PAYMENT

Payments can be made by cheque (made payable to ASRANet Ltd.), cash or bank transfer. Please enquire for details.

Contact Us

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ONLINE

Basic Naval Architecture

11-13 April 2022



(A Maritime Company for Courses,
Conferences and Research)

PROGRAMME SCHEDULE

ALL TIMINGS ARE IN BST (GMT+1)

Monday 11 April 2022

09.00 - 10.30 Lecture 1: Introduction and definitions
Instructor: ***Ian Winkle***

Axes and principal dimensions, abbreviations and vector references. Form Coefficients. TPC, MCT1cm. Displacement / Lightship / Deadweight. Hydrostatic. Lines, Body Plan and GA. Static Balance; Volume and Centroid Calculations. Worked examples Moment Calculations.

10.30 -10.45 *Break*

10.45 -12.15 Lecture 2: Initial Stability
Instructor: ***Ian Winkle***

Trim and Heel. Metacentres. Centre of Floatation. Conditions of Stability – vectors GZ and GM – Stable Neutral and Unstable. Vector relationship $KB+BM = KG+KM$. $BM = I/V$. I for simple shapes and parallel axis correction – worked examples. Three Sinkage/Trim examples.

12.15 - 12.45 *Lunch*

12.45 - 14.15 Lecture 3: Large Angle Stability
Instructor: ***Ian Winkle***

Statical Stability curves and their Characteristics. KN, GZ, GG1 Correction. IMO Requirements. Wind heel and cargo

shift. Inclining Experiment. Free Surface Effect. Effects of Beam, Freeboard and VCG. Weights on derricks/cranes etc. Some simple tutorial examples.

Tuesday 12 April 2022

09:00-10.30 Lecture 4: Damage Stability
Instructor: ***Ian Winkle***

Sinkage and trim effects. Permeability; Lostbuoyancy or Added Weight. Transverse and longitudinal subdivision – importance of cross flooding. Floodable Length Curves. Comparison between Deterministic and Probabilistic approaches to Damage Survivability.

10.30 -10.45 *Break*

10.45-12.15 Lecture 5: Resistance and Propulsion
Instructor: ***Ian Winkle***

Components of Resistance. Model tests. Effects of surface Roughness, fluid Density, L, B, Cp, WSA, Speed. Friction Lines. Residuary Resistance. Hull Roughness, Service Margin. Propeller Efficiency and QPC, EHP, DHP, SHP, Installed Power, Margins. Measured Mile Trials.

12.15 - 12.45 *Lunch*

12.45-14.15 Lecture 6: Sea Keeping-I
Instructor: ***Professor D.Sen***

Description of Ocean Waves: Regular and Irregular

Waves; Single and Multi-Degree Equations of Motion for a Ship

Wednesday 13 April 2022

09:00-10.30 Lecture 7: Sea Keeping-II
Instructor: ***Professor D.Sen***

Ship Motions in Regular waves, RAO; Ship Motions in Irregular Waves, Response Spectra, Derived Motions.

10.30 -10.45 *Break*

10:45-12:15 Lecture 8: Manoeuvring
Instructor: ***Professor D.Sen***

Directional Stability; Equation of Motion in Horizontal Plane, Hydrodynamic Derivatives, Stability Index.

CV of Lecturer

Ian Winkle

A member of RINA and a Chartered Engineer, his initial training and experience were with Vickers Ltd. Shipbuilding Group on the Tyne as part of a Student Apprenticeship which also saw a period at their ship model experiment tank in St Albans. This was followed by 4 years as a Research Officer with BSRA's Production Division at Wallsend before entering the academic world. He is now retired after 31 years in the Departments of Naval Architecture at the Northern Ireland Polytechnic, Glasgow and Strathclyde Universities where he specialised in Naval Architecture Statics and Ship Construction. Research activity has included the application of Structural Adhesives to steel and composite structures in the marine industry and since the 'Herald of Free Enterprise' disaster in 1987, he has maintained a particular interest in the mechanics of the loss of passenger vessels through capsizing and design modifications which might mitigate such effects, helping to develop the 'Glasgow Concept' of uncapsizeable ferries. Retirement activities have included Volunteer Guiding and Research at Glasgow's Riverside Museum with a special interest in their ship collection and the losses of Daphne and Lusitania. In 2015, he moved to Yeovil in Somerset where he is now a Volunteer 'Explainer' at the Yeovilton Fleet Air Arm Museum and continues to participate in the local branches of RINA and IMarEST.

Professor. D Sen

Prof. D Sen, B.Tech, M.Eng., Ph.D., FRINA, FIE is a Professor and former head of the Department of Ocean Engineering and Naval Architecture, as well as former head of the Centre for Oceans, Rivers, Land and Atmospheric Sciences, Indian Institute of Technology Kharagpur India. He has completed his graduate studies (master's and Ph.D.) from Memorial University of Newfoundland, Canada during 1982- 1988. Since 1988, he is engaged in teaching and research at Indian Institute of Technology Madras (1988-1991) and Indian Institute of Technology Kharagpur (1991 – present). Prior to proceeding for graduate studies, he has worked for about 4 years (1977-1981) in a large shipbuilding industry. His main area of expertise is in marine hydrodynamics, with specific applications in wave-structure interactions, sea-keeping and maneuverability. He has authored a large number of papers in reputed journals such as Journal of Ship Research, Applied Ocean Research, and also in many well-known international conferences. He is presently in the editorial board of two international journals. He has successfully completed many sponsored research and industrial consultancy projects. He was Principal Coordinator of the National Program in Marine Hydrodynamics during 2007-2014, a national programme under the Naval research Board for coordinating developments in marine hydrodynamics within India. He was the leader of the R&D project on development of India's first

indigenously developed AUV. He has been a member of a large number of national and international committees including the AUV division of ECOR committee. One of his main interests is to disseminate knowledge on practical state-of-art applications of hydrodynamics in marine design.