



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

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Department of Marine Engineering	LP: MR18704 Rev. No: 00
B.E./B.Tech/M.E./M.Tech : Marine Engineering Regulation: 2018	Date: 13.07.2021
PG Specialisation : Not applicable	
Sub. Code / Sub. Name : MR18704 Stability of Ships	
Unit : I HYDROSTATICS	

Unit Syllabus: Density, relative density, pressure exerted by a liquid on an immersed plane, centre of pressure, load on immersed plane, load diagram, shearing forces on bulk head stiffeners - problems.

Objective: To impart the Knowledge on the Basic Hydrostatics and Stability Calculations of Ships.

Session No *	Topics to be covered	Ref	Teaching Aids
1	Density, relative density	T1 – Page 1 to 16	PPT/BB
2	Pressure exerted by a liquid on an immersed plane	T1 – Page 1 to 16	PPT/BB
3	Centre of pressure	T1 – Page 1 to 16	PPT/BB
4	Load on immersed plane	T1 – Page 1 to 16	PPT/BB
5	Load diagram	T1 – Page 1 to 16	PPT/BB
6	Shearing forces on bulk head stiffeners	T1 – Page 1 to 16	PPT/BB
7	Problem solving & tutorial	T1 – Page 15 & 16	PPT/BB
8	Problem solving & tutorial	1,2,3 & 4	PPT/BB
9	Problem solving & tutorial	1,2,3 & 4	PPT/BB
10	Problem solving & tutorial	1,2,3 & 4	PPT/BB
11	Problem solving & tutorial	1,2,3 & 4	PPT/BB
12	Problem solving & tutorial	1,2,3 & 4	PPT/BB

Content beyond syllabus covered (if any):
Practical examples relating to collapse of bulk head and damage to ship side discussed.



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Sub. Code / Sub. Name: MR18704 Stability of Ships

Unit : II GEOMETRY AND SHIP FORM CALCULATION

Unit Syllabus : Archimedes principle, Laws of floatation, displacement, tonne per cm immersion. Coefficients of form, wetted surface area, similar figures, shearing force and bending moment – problems

Objective: To impart the knowledge of Basic hydrostatics, Geometry of Ships

Session No *	Topics to be covered	Ref	Teaching Aids
13	Archimedes principle	T1 - Page 17 to 26	PPT/BB
14	Laws of floatation	T1 - Page 17 to 26	PPT/BB
15	Displacement	T1 - Page 17 to 26	PPT/BB
16	Tonne per cm immersion	T1 - Page 17 to 26	PPT/BB
17	Coefficients of form	T2 -Page 12 to 14	PPT/BB
18	Wetted surface area	1,2,3&4	PPT/BB
19	Shearing force and bending moment	1,2,3&4	PPT/BB
20	Problem solving & tutorial	1,2,3&4	PPT/BB
21	Problem solving & tutorial	1,2,3&4	PPT/BB
22	Problem solving & tutorial	1,2,3&4	PPT/BB
23	Problem solving & tutorial	1,2,3&4	PPT/BB
24	Problem solving & tutorial	1,2,3&4	PPT/BB

Content beyond syllabus covered (if any):



Sub. Code / Sub. Name: MR18704 Stability of Ships

Unit : III CALCULATION OF AREA, VOLUME, FIRST AND SECOND MOMENTS

Unit Syllabus : Definition and regulation, Simpson's first rule and second rule, application to area and volume, use of intermediate ordinate rule, trapezoidal rule, mean and mid — ordinate rule, application of 5 + 8 — I Rule for area, application of Simpson's rule to first and second moments of area — Centre of gravity, effect of addition of mass, effect of movement of mass, effect of suspended mass — problems.

Objective: To impart the knowledge of Calculations Viz. various coefficients

Session No *	Topics to be covered	Ref	Teaching Aids
25	Simpsons first rule and second rule	TI —Page 38 to 54 T2 — Page 22 to 34	PPT/BB
26	Application to area and volume	TI —Page 38 to 54 T2 — Page 22 to 34	PPT/BB
27	Use of intermediate ordinate rule	TI — Page 38 to 54 T2- Page 22 to 34	PPT/BB
28	Trapezoidal rule	T1 —Page 38 to 54 T2-Page 22 to 34	PPT/BB
29	Mean and mid ordinate rule	T1 - Page 38 to 54 T2 -Page 22 to 34	PPT/BB
30	Application of 5 + 8 — I Rule for area	T1 -Page 38 to 54 T2 - Page 22 to 34	PPT/BB
31	Application of Simpson rule to first and second moments of area	T1-Page 38 to 54 T2 - Page 22 to 34	PPT/BB
32	Centre of gravity, effect of addition of mass	T1 -Page 58 to 64	PPT/BB
33	Effect of movement of mass, effect of suspended	1,2,3&4	PPT/BB
34	Problem solving & tutorial	1,2,3&4	PPT/BB
35	Problem solving & tutorial	1,2,3&4	PPT/BB
36	Problem solving & tutorial	1,2,3&4	PPT/BB

Content beyond syllabus covered (if any):

Effect of hanging masses such as mutton in the fridge room and storing of heavy masses such as propeller, anchor and tail soft explained.



Sub. Code / Sub. Name: MR18704 Stability of Ships

Unit : IV **TRANSVERSE, STABILITY AND HEEL**

Unit Syllabus:

Stability at small angles of heel, calculation of BM and metacentric height, metacentric diagram, inclining experiment, free surface effect, list and its corrections, stability at small angles, large angles of heel, curves of static stability, moments of Statical stability, dynamic stability, initial stability, angle of loll, stability of a wall sided ship —inclining experiment, problems. IMO recommendations concerning ship stability.

Objective: To impart the Knowledge of calculating the Area of wetted Surface, Volume etc.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Static stability at small angles of heel	T1 -Page 69 to 77 T2- page 91 to 101	PPT/BB
38	Calculation of BM and meta centric height	T1 -page 69 to 77	PPT/BB
39	Meta centric diagram, inclining experiment	TI -Page 69 to 77	PPT/BB
40	Free surface effect	TI -Page 81 to 86 T2 -Page 99	PPT/BB
41	Stability at large angles of heel, curves of static stability	T1 -Page 87 to 92	PPT/BB
42	Dynamic stability	T2 -Page 125	PPT/BB
43	Angle of loll	Page 115	PPT/BB
44	Stability of a wall sided ship	T1 -Page 93 to 94 T2-Page 101	PPT/BB
45	Inclining experiment	T1 -Page 78 to 79 T2 -Page 130	PPT/BB
46	IMO recommendations concerning ship stability	T2 page 94 to 97	PPT/BB
47	Problem solving & tutorial		PPT/BB
48	Problem solving & tutorial		PPT/BB

Content beyond syllabus covered (if any):

The changes that have been incorporated in IMO regulations for stability due to marine disasters explained.



Sub. Code / Sub. Name: MR18704 Stability of Ships

Unit : V LONGITUDINAL STABILITY

Unit Syllabus: LONGITUDINAL STABILITY Longitudinal BM — MCTI cm — Change of trim, change of LCB with change of trim, alteration of trim by adding or removing weights, mean draft, change in mean and end draft due to density and bilging — flooding calculation — floodable length — factor of subdivision — loss of stability due to grounding, partial loss of intact stability, problems- Knowledge of Trim and stress tables, diagrams and stress calculating equipment.

Objective: To impart the Knowledge on Transverse Stability and Heel etc.,

Session No *	Topics to be covered	Ref	Teaching Aids
49	Longitudinal BM — MCTI cm	TI —Page 98 to 111 T2 - Page 64 to 66	PPT/BB
50	Change of trim, change of LCB with change of trim	T2 -Page	PPT/BB
51	Alteration of trim by adding or removing weights	T2- Page	PPT/BB
52	Mean draft, change in mean and end draft due to density	TI -Page 98 to 111	PPT/BB
53	Flooding calculation	TI -Page 98 to 111	PPT/BB
54	Floodable length , Factor of sub division	TI -Page 98 to 111	PPT/BB
55	Loss of stability due to grounding	Page 98 to 111	PPT/BB
56	Knowledge of Trim and stress tables	TI -Page 98 to 111	PPT/BB
57	Problem solving & tutorial	1,2,3 & 4	PPT/BB
58	Problem solving & tutorial	1,2,3 & 4	PPT/BB
59	Problem solving & tutorial	1,2,3 & 4	PPT/BB
60	Problem solving & tutorial	1,2,3 & 4	PPT/BB

Content beyond syllabus covered (if any):

Knowledge of additional stresses that are likely to build up on the ship structure are explained with practical cases.



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Outcome:

Good understanding of Basic hydrostatics & Applications
Calculation of position of zero shier and maximum pending movement to different conditions of ship loading.
Understanding of Geometry of Ships & Ship form calculation
Calculations Viz. various coefficients,
Calculating the Area of wetted Surface, Volume etc., Longitudinal Stability and Heel etc.,

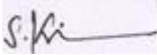
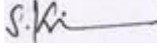
TEXT BOOKS:

Stokoe, E.A., "Reeds' Naval Architecture for Marine Engineers", 4th Edition, Thomas Reed Publications, London, 1982.

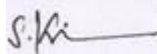
K.J. Rawson and E.C Tupper "Basic ship theory" volume — I & II — 5th edition Butterworth and heine mann, London , 2001.

REFERENCES:

G.N.Hatch, "Creative Naval Architecture", 1st Edition, Thomas Reed Publications, London, 1971.

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Date	13.07.2021	13.07.2021

Since there is no change in syllabus the same lesson plain is followed for the A.Y. 2022-2023.


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Date: 01/08/2022