



## SRI VENKATESWARA COLLEGE OF ENGINEERING

## COURSE DELIVERY PLAN - THEORY

Page 1 of 6

Department of Marine Engineering		LP: MR16801
B.E/B.Tech/M.E/M.Tech: MARINE Regulation: 2016		Rev. No: 00
PG Specialisation : Nil		Date: 09.12.2019
Sub. Code / Sub. Name : MR16801 MARINE VEHICLES PERFORMANCE		
Unit : I RESISTANCE		

Unit Syllabus: Types of resistance, frictional, residuary and total resistance, air, appendage, wave making, eddy and form resistances, model testing, propeller tests in open water, Admiralty coefficient, fuel coefficient and consumption, sea trials – Form parameters and resistance -Problems.

Objective: On Completion of Course the Students are expected to have knowledge about, Ships Models and the Sea Trials, Various types of Propellers and Rudders, Wave motions and the Ships Vibrations

Session No *	Topics to be covered	Ref	Teaching Aids
1.	Types of resistance	T1 – Page 381 to 394	PPT/BB
2.	Frictional, residuary and total resistance	T1 – Page 381 to 394	PPT/BB
3.	Air, appendage, wave making resistance	T1 – Page 381 to 394	PPT/BB
4.	Eddy and form resistances	T1 – Page 381 to 394	PPT/BB
5.	Model testing	T1 – Page 413 to 417	PPT/BB
6.	Propeller tests in open water	T1,T2,R1 & R4	PPT/BB
7.	Admiralty coefficient, fuel coefficient	T1 – Page 413 to 417	PPT/BB
8.	Fuel consumption, sea trials	T1,T2,R1 & R4	PPT/BB
9.	Form parameters and resistance	T1,T2,R1 & R4	PPT/BB
10.	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
11.	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
12.	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
13.	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
14.	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
Content beyond syllabus covered (if any): Ample practical cases relevant to the theory taught, most appropriate practical solution to the case taken are discussed.			



## SRI VENKATESWARA COLLEGE OF ENGINEERING

## COURSE DELIVERY PLAN - THEORY

Page 2 of 6

Sub. Code / Sub. Name : MR16801 MARINE VEHICLES PERFORMANCE

Unit : II PROPELLER THEORY

Unit Syllabus: Types of propellers, apparent slip, real slip, wake, thrust, relation between powers and speed, measurement of pitch, cavitations, built and solid propellers, interaction between the ship and propeller, hull efficiency over all propulsive efficiency – problems

Objective: On Completion of Course the Students are expected to have knowledge about, Ships Models and the Sea Trials, Various types of Propellers and Rudders, Wave motions and the Ships Vibrations

Session No *	Topics to be covered	Ref	Teaching Aids
15	Types of propellers, apparent slip, real slip	T1 – Page 395 to 412 & 449 to 464	PPT/BB
16	Wake, thrust	T1 – Page 395 to 412 & 449 to 464	PPT/BB
17	Relation between power and speed	T1 – Page 395 to 412 & 449 to 464	PPT/BB
18	Measurement of pitch	T1 – Page 395 to 412 & 449 to 464	PPT/BB
19	Cavitations	T1 – Page 395 to 412 & 449 to 464	PPT/BB
20	Built and solid propellers	T1 – Page 395 to 412 & 449 to 464	PPT/BB
21	Interaction between the ship and propeller	T1 – Page 395 to 412 & 449 to 464	PPT/BB
22	Hull efficiency over all propulsive efficiency	T1 – Page 395 to 412 & 449 to 464	PPT/BB
23	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
24	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
25	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
26	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
Content beyond syllabus covered (if any): Different types of propellers, their suitability and efficacy in variety of sea going vessels are discussed.			

\* Session duration: 50 mins





Sub. Code / Sub. Name : MR16801 MARINE VEHICLES PERFORMANCE

Unit : III RUDDER THEORY

**Unit Syllabus:** Types of rudders, model experiments and turning trials, area and shape of rudder, position of rudder, bow rudders Vs stern rudder, forces on rudder, torque on stock, angle of heel due to force on rudder and angle of heel when turning – problems

**Objective:** On Completion of Course the Students are expected to have knowledge about, Ships Models and the Sea Trials, Various types of Propellers and Rudders, Wave motions and the Ships Vibrations

Session No *	Topics to be covered	Ref	Teaching Aids
27	Types of rudders	T1 Page 555 to 570	PPT/BB
28	Model experiments and turning trials	T1 Page 555 to 570	PPT/BB
29	Area, shape and position of rudder	T1 Page 555 to 570	PPT/BB
30	Bow rudders Vs stern rudder	T1 Page 555 to 570	PPT/BB
31	Forces on rudder, Torque on stock	T1 Page 555 to 570	PPT/BB
32	Angle of heel due to force on rudder	T1 Page 555 to 570	PPT/BB
33	Angle of heel when turning	T1,T2,R1 & R4	PPT/BB
34	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
35	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB
36	Problem solving & tutorial	T1,T2,R1 & R4	PPT/BB

Content beyond syllabus covered (if any):

Various types of rudders and the latest developments in rudder design are discussed.



Sub. Code / Sub. Name : MR16801 MARINE VEHICLES PERFORMANCE

Unit : IV WAVE THEORY

Unit Syllabus: Theory of waves, Regular waves, Trochoidal waves, relationship between line of orbit centres and the undisturbed surface, sinusoidal wave, Irregular wave pattern, wave spectra, wave amplitudes, freak waves, rolling in unresisting media, rolling in resisting media, practical aspects of rolling, Anti rolling devices, forces caused by rolling, pitching, heaving and yawing.

Objective: On Completion of Course the Students are expected to have knowledge about, Ships Models and the Sea Trials, Various types of Propellers and Rudders, Wave motions and the Ships Vibrations

Session No *	Topics to be covered	Ref	Teaching Aids
37	Theory of waves, Trochoidal waves	T1 – Page 473 to 507	PPT/BB
38	Relationship between line of orbit centres and the undisturbed	T1 – Page 473 to 507	PPT/BB
39	Sinusoidal wave	T1 – Page 473 to 507	PPT/BB
40	Irregular wave pattern	T1 – Page 473 to 507	PPT/BB
41	Wave spectra, wave amplitudes	T1 – Page 473 to 507	PPT/BB
42	Rolling in unresisting media	T1 – Page 473 to 507	PPT/BB
43	Rolling in resisting media	T1 – Page 473 to 507	PPT/BB
44	Practical aspects of rolling	T1 – Page 473 to 507	PPT/BB
45	Anti rolling devices	T1,T2,R1 & R4	PPT/BB
46	Forces caused by rolling	T1,T2,R1 & R4	PPT/BB
47	Pitching	T1,T2,R1 & R4	PPT/BB
48	Heaving and yawing	T1,T2,R1 & R4	PPT/BB

Content beyond syllabus covered (if any):

Wave motions including effect of rogue waves on the ship structure are discussed.





Sub. Code / Sub. Name : MR16801 MARINE VEHICLES PERFORMANCE

Unit : V SHIP VIBRATION & NOISE

**Unit Syllabus:** Sources of Ship Vibration – Internal and External Sources, Hull vibration, Engine vibration, vibration of shafting system, engine noise reduction, Ship response, Hull Girder vibration, Distribution of weights, Ship as a uniform beam, Types of Deformation, Modes and Nodes, Natural Frequency of Hull Girder, Fundamental Mode of Flexural Vibration, Uniform Beam - Vibration Equation

**Objective:** On Completion of Course the Students are expected to have knowledge about the effect the ship vibration and its causes also the importance of noise reduction including noise code for ships.

Session No *	Topics to be covered	Ref	Teaching Aids
49	Sources of Ship Vibration – Internal and External Sources	T1- Page	PPT/BB
50	Hull vibration, Engine vibration	T1,T2,R1 & R4	PPT/BB
51	Vibration of shafting system	T1,T2,R1 & R4	PPT/BB
52	Engine noise reduction	T1,T2,R1 & R4	PPT/BB
53	Ship response	T1,T2,R1 & R4	PPT/BB
54	Hull Girder vibration	T1,T2,R1 & R4	PPT/BB
55	Distribution of weights	T1,T2,R1 & R4	PPT/BB
56	Ship as a uniform beam	T1,T2,R1 & R4	PPT/BB
57	Types of Deformation, Modes and Nodes	T1,T2,R1 & R4	PPT/BB
58	Natural Frequency of Hull Girder	T1,T2,R1 & R4	PPT/BB
59	Fundamental Mode of Flexural Vibration	T1,T2,R1 & R4	PPT/BB
60	Uniform Beam - Vibration Equation	T1,T2,R1 & R4	PPT/BB

Content beyond syllabus covered (if any):

The students are made aware about the disasters consequences due to vibration taking case studies observations and outcomes



## SRI VENKATESWARA COLLEGE OF ENGINEERING

## COURSE DELIVERY PLAN - THEORY

Page 6 of 6



Sub Code / Sub Name: MR16801 MARINE VEHICLES PERFORMANCE

**TEXT BOOKS:**

1. K.J. Rawson and E.C. Tupper, "Basic Ship Theory" (Vol. II), 5th Edition, Butterworth Heinemann, London, 2001.
2. Eric C. Tupper, "Introduction to Naval Architecture", 3rd Edition, Butter worth – Heinemann, London, 2001.
3. EA Stokoe, E.A, "Naval Architecture For Marine Engineers", Vol.4, Reeds Publications, 2000
4. Singiresu S. Rao, "Mechanical Vibrations", Pearson, 4th Ed., Pearson, 2013
5. John Carlton, "Marine Propellers and Propulsion", Butterworth-Heinemann, 2012

**REFERENCES:**

1. "Principles of Naval Architecture", SNAME Publication, 2000
  2. R. Battacharjee. "Dynamics of Marine vehicles "SNAME Publication.
  3. Srikant Bhawe, "Mechanical Vibrations", Pearson, 2010
- Malcolm, J. Crocker, "Handbook of Noise and Vibration Control", John Wiley & Sons, 2007

	Prepared by	Approved by
Signature		
Name	Prof. S KRISHNAN	Prof. S KRISHNAN
Designation	PROFESSOR & HOD	PROFESSOR & HOD
Date	09/12/2019	09/12/2019
Remarks *:		
Remarks *:		

\* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD