FACULTY OF ENGINEERING & TECHNOLOGY

DEPARTMENT OF

CIVIL ENGINEERING

Marwadi University Marwadi Chandarana Group NAAC A+

Port & Harbour Engineering

01CI0724

Objective of the Course:

- To understand the fundamentals of Port & Harbour Engineering.
- To determine requirements of various facilities on port and harbour.
- To understand various natural phenomena affecting port and harbour planning.
- To know the operational management of port and habour.

Credit Earned: 03

Student's learning outcomes:

After successful completion of the course, it is expected that students will be able to,

1. Understand importance of natural phenomena in planning of ports and harbors.
2. Value the importance of functional components in planning of ports and harbors.
3. Distinguish between various maintenance techniques for ports and harbors.
4. Recognize visual aids of ports and harbors.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA (M)	CSE (I)	Viva (V)	Term Work (TW)	
03	00	00	03	50	30	20	25	25	150

Detailed Syllabus

Sr. No	Topic name	Hours
1	**Introduction to Water Transportation**	**06**
	1.1 History, Scope and Merits of Water Transportation, Water Transportation in India, Inland water transportation, Harbor, Port, Dock.	03
	1.2 Development of Ports & Harbors, Classification of ports and harbours.	03
2	**Natural Phenomena**	**08**
	2.1 Wind, Tides, Water waves, Wind rose and wave rose diagrams, wave diffraction, breaking, reflection, Littoral drift.	04

	2.2 Sediment transport, Effects on Harbor and structure design.	04
3	**Port Planning, Amenities and Operations**	**10**
	3.1 Characteristics of good seaport and principles of seaport planning, size of seaport, site selection criteria and layout of seaport	02
	3.2 Dry ports, Bulk cargo, Transshipment ports, Port of call, Surveys to be carried out for seaport planning.	04
	3.3 Ferry, Transfer bridges, floating landing stages, transit sheds, warehouses, cold storage, aprons, cargo handling equipment, purpose and general description: stack area, single point mooring, IS provisions	04
4	**Harbour Infrastructures**	**10**
	4.1 Ship characteristics. Design of Harbor entrance, channel, turning basin, IS provisions, Breakwaters - function, types, general design principles	04
	4.2 Wharves, quays, jetties, piers, pier heads, dolphin, fenders, mooring accessories, IS provisions. Repair facilities, wet docks, lift docks, dry docks, gates for graving docks, floating docks, slipways, locks and gates.	06
5	**Maintenance and Navigational Aids**	**08**
	5.1 Coastal protection-purpose and devices, sea wall protection-seawall revetment, bulkhead. Dredging, dredgers-types and suitability, usage of dredged materials.	04
	5.2 Channel and entrance demarcation, buoys, beacons, light house electronic communication devices.	04
	TOTAL	**42**

Suggested Theory Distribution

The suggested theory distribution as per Bloom's taxonomy is as per follows. This distribution serves as guidelines for teachers and students to achieve an effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
5%	10%	30%	30%	15%	10%

Instructional Method and Pedagogy:

1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course.
2 Lectures shall be conducted in class room using various teaching aids.
3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation.

4 At the end of each unit/topic an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.

Recommended Study Material:

Reference Book:

1. S. P. Bindra, A Course in Docks and Harbour Engineering, 1992, Dhanpat Rai & Sons, New Delhi.
2. Alonzo Def. Quinn, Design and Construction of Ports and Marine Structure, McGraw - Hill Book Company, New York.
3. IS Codes: 4651 (Part I to V), 7314, 9527 (Part I, III, IV, VI), 10020 (Part IV).

Text Book:

1. R. Srinivasan and S. C. Rangwala, Harbour, Dock and Tunnel Engineering, 1995, Charotar Pub. House, Anand.

Web Links

- https://archive.nptel.ac.in/courses/114/106/114106025/