

<b>INSTITUTE</b>	<b>FACULTY OF TECHNOLOGY</b>
<b>PROGRAM</b>	<b>BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)</b>
<b>SEMESTER</b>	<b>7</b>
<b>COURSE TITLE</b>	<b>PORT &amp; HARBOUR ENGINEERING</b>
<b>COURSE CODE</b>	<b>01CI0724</b>
<b>COURSE CREDITS</b>	<b>3</b>

**Objective:**

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

**Course Outcomes:** After completion of this course, student will be able to:

- 1 Implement rules and principles for the 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.

**Pre-requisite of course:**Transportation Engineering

**Teaching and Examination Scheme**

<b>Theory Hours</b>	<b>Tutorial Hours</b>	<b>Practical Hours</b>	<b>ESE</b>	<b>IA</b>	<b>CSE</b>	<b>Viva</b>	<b>Term Work</b>
3	0	0	50	30	20	25	25

<b>Contents : Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Introduction to Water Transportation</b> History, Scope and Merits of Water Transportation, Water Transportation in India, Inland water transportation, Harbor, Port, Dock., Development of Ports & Harbors, Classification of ports and harbours.	6
2	<b>Natural Phenomena</b> Wind, Tides, Water waves, Wind rose and wave rose diagrams, wave diffraction, breaking, reflection, Littoral drift., Sediment transport, Effects on Harbor and structure design.	8

Contents : Unit	Topics	Contact Hours
3	<b>Port Planning, Amenities and Operations</b> Characteristics of good seaport and principles of seaport planning, size of seaport, site selection criteria and layout of seaport, Dry ports, Bulk cargo, Transshipment ports, Port of call, Surveys to be carried out for seaport planning., 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	10
4	<b>Harbour Infrastructures</b> Ship characteristics. Design of Harbor entrance, channel, turning basin, IS provisions, Breakwaters - function, types, general design principles, 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.	10
5	<b>Maintenance and Navigational Aids</b> Coastal protection-purpose and devices, sea wall protection- seawall revetment, bulkhead. Dredging, dredgers-types and suitability, usage of dredged materials., Channel and entrance demarcation, buoys, beacons, light house electronic communication devices.	8
<b>Total Hours</b>		<b>42</b>

#### Textbook :

- 1 A Course in Docks and Harbour Engineering., S. P. Bindra., Dhanpat Rai & Sons, New Delhi., 1992

#### References:

- 1 Design and Construction of Ports and Marine Structure., Design and Construction of Ports and Marine Structure., Alonzo Def. Quinn., McGraw - Hill Book Company, New York., 2001

#### Suggested Theory Distribution:

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

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
5.00	10.00	30.00	30.00	15.00	10.00

#### Instructional Method:

- 1 Prerequisite of the course and its pattern shall be discussed on the commencement of the course.

**Instructional Method:**

- 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.

**Supplementary Resources:**

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