



**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**  
**DEPARTMENT OF CIVIL ENGINEERING**

COURSE PLAN – PART I			
<b>Name of the Programme and Specialization</b>	M. Tech, Transportation Engineering and Management		
<b>Course Title</b>	Waterway Transportation		
<b>Course Code</b>	CE616	<b>No. of Credits</b>	3
<b>Course Code of Pre-requisite subject(s)</b>	-		
<b>Session</b>	July 2020	<b>Section (If applicable)</b>	-
<b>Name of Faculty</b>	Dr Darshana O	<b>Department</b>	Civil Engineering
<b>Email</b>	darshana@nitt.edu	<b>Telephone</b>	-
<b>Name of Course Coordinator(s) (If applicable)</b>	-		
<b>Email</b>	darshana@nitt.edu	<b>Telephone</b>	-
<b>Course Type</b>	Core course <input type="checkbox"/> Elective course <input checked="" type="checkbox"/>		
<b>Syllabus (approved in BoS)</b>			
<p>Harbour Planning: Types of water transportation, water transportation in India, requirements of ports and harbours, classification of harbours, selection of site and planning of harbours, location of harbour, traffic estimation, master plan, ship characteristics, harbour design, turning basin, harbour entrances, type of docks, its location and number, Site investigations – hydrographic survey, topographic survey, soil investigations, current observations, tidal observations.</p> <p>Docks and Repair Facilities: Design and construction of breakwaters, berthing structures - jetties, fenders, piers, wharves, dolphins, trestle, moles, Harbour docks, use of wet docks, design of wet docks, repair docks, lift docks, dry docks, keel and bilge blocking, construction of dry docks, gates for dry docks, pumping plant, floating docks, slipways, locks, size of lock, lock gates, types of gates.</p> <p>Navigational Aids: Requirements of signals, fixed navigation structures, necessity of navigational aids, light houses, beacon lights, floating navigational aids, light ships, buoys, radar.</p> <p>Dredging and Coastal Protection: Classification, types of dredgers, choice of dredger, uses of dredged materials, coastal erosion and protection, sea wall, revetment, bulkhead, coastal zone and beach profile.</p> <p>Port facilities: Port development, port planning, port building facilities, transit sheds, warehouses, cargo handling facilities, container handling terminal facilities, shipping terminals, inland port facilities. Inland waterways, Inland water transportation in India, classification of waterways, economics of inland waterways transportation, national waterways</p>			

## References

1. Bindra, S.P. *A Course in Docks and Harbour Engineering*, Dhanpat Rai & Sons, New Delhi, India, 1992.
2. Seetharaman, S. *Dock and Harbour Engineering*, Umesh Publications, New Delhi, India, 1999.
3. Srinivasan, R., *Harbour, Dock and Tunnel Engineering*, Charotar Publishing House, Anand, India, 2009.

## COURSE OBJECTIVES

- To know about water transport and harbour planning
- To learn about different docks and repair systems
- To understand the navigational aids
- To understand dredging and coastal protection
- To learn about port facilities

## COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
On completion of the course, the students will be able to:	
1. Understand the aspects of harbour design	1 2 3 6 7 8 9
2. Design and construction of breakwater and docks	1 2 4 7 8 10
3. Understand the navigational aids	1 3 4 5 6 8
4. Understand dredging and coastal protection	2 3 4 6 7 10
5. Plan port and other facilities in the port	2 3 4 6 7 9 11

## COURSE PLAN – PART II

### COURSE OVERVIEW

The course gives overall idea of port planning, design of harbours, various navigational aids and dredging methods.

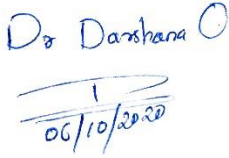


### COURSE TEACHING AND LEARNING ACTIVITIES

Sl.No.	Week/Contact hour	Topic
1	Week 1	Types of water transportation, water transportation in India
		Classification of harbours, selection of site and planning of harbours, location of harbour, traffic estimation, master plan

		Ship characteristics, harbour design, turning basin, harbour entrances, type of docks, its location and number
2	Week 2	Site investigations – hydrographic survey, topographic survey, soil investigations, current observations, tidal observations.
		Design and construction of breakwaters
		Berthing structures - jetties, fenders, piers, wharves, dolphins, trestle, moles
3	Week 3	Harbour docks, use of wet docks, design of wet docks
		Repair docks, lift docks, dry docks, keel and bilge blocking
		Construction of dry docks, gates for dry docks, pumping plant, floating docks, slipways, locks, size of lock, lock gates, types of gates
4	Week 4	Requirements of signals, fixed navigation structures, necessity of navigational aids,
		Light houses, beacon lights, floating navigational aids
5	Week 5	Light ships, buoys, radar.
		Dredging and Coastal Protection: Classification, types of dredgers
		Choice of dredger, uses of dredged materials, coastal erosion and protection
6	Week 6	Sea wall, revetment, bulkhead, coastal zone and beach profile.
		Port development, port planning
7	Week 7	Port building facilities, transit sheds, warehouses, cargo handling facilities, container handling terminal facilities
		Shipping terminals, inland port facilities.
		Inland waterways, Inland water transportation in India, economics of inland waterways transportation, national waterways

### **COURSE ASSESSMENT METHODS**

<b>Sl.No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1	Cycle Test 1	Week 4	1 hour	20
2	Cycle Test 2	Week 7	1 hour	20
3	Assignments and quizzes	Two assignments/ two quizzes from unit 1 to 4		20
4	Seminar	One seminar from unit 5		10
4	Compensation Assessment	Week 8	1 hour	20

5	Final Assessment	Week 9	2 hours	30
<b>COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)</b>				
<ul style="list-style-type: none"> <li>• Feedback from students during Class committee meetings</li> <li>• Anonymous feedback through questionnaire at the end of the semester</li> </ul>				
<b>COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, academic honesty and plagiarism etc.)</b>				
<b><u>MODE OF CORRESPONDENCE (email/ phone etc.)</u></b>				
<ul style="list-style-type: none"> <li>• Mode of correspondence would be through phone/ email only to the class representatives and vice versa.</li> </ul>				
<b><u>ATTENDANCE POLICY</u></b>				
<ul style="list-style-type: none"> <li>• At least 75% attendance in each course is mandatory.</li> </ul>				
<b><u>COMPENSATION ASSESSMENT POLICY</u></b>				
Retest would be given to those students who have missed either Cycle Test 1 or Cycle Test 2 because of genuine reasons. Portions of retest would include both portions from Cycle Test 1 and 2.				
<b><u>ACADEMIC DISHONESTY AND PLAGARISM</u></b>				
<ul style="list-style-type: none"> <li>➤ Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.</li> <li>➤ Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.</li> <li>➤ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.</li> </ul>				
The above policy against academic dishonesty shall be applicable for all the programmes.				
<b><u>ADDITIONAL INFORMATION</u></b>				
<ul style="list-style-type: none"> <li>• The Course Coordinator is available for consultation during office hours.</li> <li>• Queries, if any, can be emailed to Course Coordinator directly at <a href="mailto:darshana@nitt.edu">darshana@nitt.edu</a></li> </ul>				
<b><u>FOR APPROVAL</u></b>				
<div style="display: flex; justify-content: space-between; align-items: flex-end; padding: 20px;"> <div style="text-align: center;">  <p>Dr. Darshana</p> <p>06/10/2020</p> <p>Course Faculty _____</p> </div> <div style="text-align: center;">  <p>L. Gandhimathi</p> <p>08-10-2020</p> <p>CC-Chairperson _____</p> </div> <div style="text-align: center;">  <p>HOD _____</p> <p style="font-size: small;">Head Department of Civil Engineering National Institute of Technology Tiruchirappalli - 620 015.</p> </div> </div>				