Kadi Sarva Vishwavidyalaya's
LDRP Institute of Technology & Research
Gandhinagar-382 015

M.E.(Civil) (Infrastructure Engineering),semester-II
Docks and Harbour Engineering Subject Name: MECV204-A

A. Learning objectives:

The objective of this course is

- To study of Developments of Water Transportation in India
- To develop concepts related Natural Phenomena e.g. Tides, Water waves, Tidal Theories
- To learn basic principles of Harbour Infrastructures
- To learn concept Port facility
- To study of Planning of ports for regional and intercontinental transportation

B. Teaching scheme (credits and hours)

Teaching Scheme				Credit Scheme			Evaluation Scheme				
Lect Hrs	Tut Hrs	Pract. Hrs	Total	Theory	Pract/TW	Total	UE	IE	CIA	PRAC/VIVA	Total
04	02	00	06	04	01	05	70	30	20	30	150

C. Detailed Syllabus

1. **Water Transportation:** Scope, Merits, Developments of Water Transportation in India, Inland waterways, River, Canal, Inland water transportation, Development of ports & Harbours, Harbour classification, Site selection, Harbour dimensioning.
2. **Natural Phenomena:** Tides, Water waves, Wave decay & port, wave diffraction, breaking, reflection, Littoral drift, sediment transport.Tidal Theories,tide tables,bore, tidal streams, Hydrographic Surveys and Charts
3. **Harbour Infrastructures:** Types of breakwaters, jetty, dock fenders, piers, wharves, dolphin, mooring accessories, Repair facilities, wet docks, lift docks, dry docks, gates for graving docks, floating docks, slipways, locks and gates, Harbour layout
4. **Port facility:** Transit shed, warehouses, cargo handling, container handling, Inland port facility, Navigational aids, types, requirements of signals, lighthouses, beacon light, buoys. Dredging & coastal protection: Types of dredgers, choices, usage of dredged material, sea wall protection-sea wall revetment, bulkhead, Navigational layout.
5. **Planning of ports for regional and intercontinental transportation :** Development, forecasting cargo & passenger demand, regional connectivity, cargo handling capacity of port, economic evaluation of port project, impacts of port activities.

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D. Lesson Planning:

Unit No	Topics	Lectures (Hours)	Weightage
1	Water Transportation:	10	17
2	Natural Phenomena:	10	18
3	Harbour Infrastructures:	15	25
4	Port facility:	15	25
5	Planning of ports for regional and intercontinental transportation	10	17
	Total	**60**	**100**

E. List of tutorials:

Sr No.	Name of tutorial
1	Problems based on cargo and passenger demand forecasting for the ports.
2	Problems based on planning and design of harbour infrastructures.
3	Problems based on planning and design of port area infrastructure.
4	Problems based on cargo handling capacity of port.
5	Problems based on economic evaluation of port project.

F. Field Visit:

- Visit to the major Port: Port area and Harbour area infrastructures.
- Review the existing facilities and capacity of port. Arrange presentation with group discussion for the suggestions of improvement if any.

G. Students Learning Outcomes:

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures and practical which carries marks.
- At regular intervals assignments will be given. Students should submit all assignments during given period.

- Classroom participation and involvement in solving the problems in Tutorial rooms Carries Marks
- Internal exam of 30 marks will be conducted as a part of Mid semester evaluation.
- The course includes a practical, where students have an opportunity to build an appreciation for the concept being taught in lectures.

K. Recommended Study Materials

Reference Books:

1. Bindra S.P., Docks & Harbour Engineering, Dhanpat Rai Publications,
2. Srinivasan R., Harbours, Docks & Tunnel Engineering, Charotar Publishing House, Anand, 1999.