PORTS AND HARBOUR STRUCTURES
(ELECTIVE-II)

Course Code: 13CE2115

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Course Educational Objectives:

1. To impart the knowledge on planning of ports and Harbours
2. To inculcate in students the understanding of port operations and construction aspects of ports and Harbours.

Course Outcomes:

1. Student will demonstrate the ability to design the infrastructure facility for port and Harbour for a given area.
2. To impart the students, with the knowledge of Introduction to Ports and harbours.
3. To impart the students, with the knowledge of Design of port infrastructures.
4. To impart the students, with the knowledge of maintenance and development of waterways and ports.

UNIT-I
INTRODUCTION AND FUNDAMENTALS

Introduction: Ports and harbours – an infrastructure layer between two transport media, planning of ports and harbours.

The fundamentals: Tide and current conditions inside harbour, water circulation; breakwaters, jetties and quay walls; mooring, berthing and ship motion inside the port; model studies, physical and mathematical studies.

UNIT-II
DESIGN ISSUES AND DESIGN OF PORT INFRASTRUCTURES

Design issues: Sea port layout with regards to (1) wave action (2) siltation (3) navigability berthing facilities.

Design of Port Infrastructures: Design of port infrastructures with regards to (1) cargo handling (2) cargo storage (3) integrated transport of goods, planning multipurpose port terminals.

UNIT-III
PORT OPERATIONS

Allowable wave conditions for cargo handling, wave conditions for human safety on quays and breakwaters, forecasting/nowcasting of wave and current conditions for port operations, dredging and navigability, hazard scenarios; VTMS and management of computerized container terminal, safety & environment (handling of fire, oil spill, rescue, etc.).

UNIT-IV
INLAND WATERWAYS AND PORTS

Maintenance of waterways, construction of environmentally engineered banks, dredging and disposal processing and storing of polluted dredged materials, development of river information services.

UNIT-V
CONSTRUCTION ASPECTS AND SUSTAINABILITY

Planning and construction expansion and renovation of port and Inland Port Infrastructure.

Global trade and port restructuring/reforms, impact of possible climate change scenarios, sustainable development strategies for cities and ports.

TEXT BOOKS

1. Muir Wood, A.M., and Fleming. C.A.*, "Coastal Hydraulics Sea and Inland Port Structures"*, 1st Edition, Hallstead Press, 2002.

2. Ozha & Ozha, *"Dock and Harbour Engineering",* 1st Edition, Charotar Books, Anand., 1990

REFERENCES

1. S.Seetharaman, *"Construction Engineering and Management",* 4th Edition , Umesh publications, New Delhi, 1999.

2. Richand L. Silister, *"Coastal Engineering Volume I & II*, Elsevier Publishers, 2000.

3. Pera Brunn, *"Port Engineering"*, 1st Edition, Gulf Publishing Company, 2001

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