PORT AND HARBOUR STRUCTURES

(Elective – II)

Course Code: 15CE2115 **L P C**
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Course Outcomes: At the end of the course, the student will be able to:

CO1: Explain the significance of port and harbours as a mode of transport.
CO2: Demonstrate the fundamental principles of wave hydrodynamics and port cargo handling.
CO3: Demonstrate the basic design of port layout.
CO4: Design, plan and integrate port and harbour infrastructure.
CO5: Explain the construction, maintenance and renovation aspects of ports and inland waterways.

UNIT-I (10-Lectures)

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

The fundamentals: Waves**,** 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 (10-Lectures)

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 (10-Lectures)

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 and environment (handling of fire, oil spill, rescue, etc.).

UNIT-IV (10-Lectures)

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 (10-Lectures)

Construction aspects: Planning and construction, expansion and renovation of port and Inland Port Infrastructure.

Sustainability: 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. PeraBrunn, *"Port Engineering",* 1st Edition, Gulf Publishing Company, 2001.