

## **SEMESTER II: PORT, HARBOUR AND COASTAL STRUCTURES**

### **OE5400: PORT AND HARBOUR STRUCTURES**

#### **Course content:**

Vessel types, types of harbour, types of breakwaters and berthing structures. Port planning, navigation channel, turning circle and berth pockets, dredging methodology, Estimation of loads, Analysis, design and construction of Berthing Structures and Breakwaters. Bathymetry survey and soil investigation, return period for operational and extreme waves, fixing crest level of breakwater and deck level of berth Structural and foundation design of concrete and steel piles and concrete Diaphragm Walls and steel sheet pile walls. Limit state design, crack width calculations and deflection limits. Codal Requirements Slipways, marine travel lift, ship lift, Offshore terminals and Islands Types of mechanical handling and conveying systems Types of fenders and Mooring Facilities. Integrity analysis of berthing structures. Low strain and High strain integrity tests. UPV and HCP tests. Retrofitting of port structures, corrosion of steel piles and protection methods Case studies of breakwater failures and other types of structures.

#### **Text Books:**

1. Design and Construction of Port and Marine Structures by A. D. Quinn, McGraw-Hill Book Company

#### **Reference Books:**

1. Port Design – Guidelines and recommendations by C. A. Thoresen, Tapir Publications
2. Design of Marine Facilities for the Berthing, Mooring and Repair of Vessels by J. W. Gaythwaite, Van Nostrand;
3. Handbook of Offshore Engineering by S.K. Chakrabarti, Elseviers, 2005.

#### **Prerequisite:**

COT for Non-OE students