

## **OE5330: ADVANCED MARINE STRUCTURES**

### **Course Content:**

Ultimate load design, Principles; Factors affecting strength, Ultimate behavior of bars and beams; Plastic capacity of sections, Plastic capacity of beams and frames, Plastic capacity of plates, Influence of membrane forces, Application to ships and offshore structures, Collision problems, Fundamentals of impact analysis, Impact capacities of steel jackets, local and global; Capacities of tubular joints, Column, flexural and torsional buckling, Design. Structural response to underwater explosion, Design issues Fluid Structure interaction, Framed offshore structures, Elements of flow-induced vibration, Vibration of underwater structures; Sound radiation and scattering by structures Design of stiffened structures, Reliability design and simulation concepts, FOSM and AFOSM methods, Partial safety factors and code calibration Fatigue and Fracture: Fatigue failure, cumulative fatigue damage models, Fracture mechanics approach to fatigue failure, Fatigue analysis and design of marine structures.

### **Text Books:**

1. Construction of Marine and Offshore Structures, by **Ben C. Gerwick Jr**
2. Offshore Structures: Design, Construction and Maintenance by **Mohamed A. El-Reedy**
3. Stochastic Dynamics of Marine Structures by **Arvid Naess, Torgeir Moan**
4. Fatigue and Fracture Mechanics of Offshore Structures by **Linus Etube**
5. Fluid Structure Interaction in Offshore Engineering by **S. K. Chakrabarti**

### **Reference Books:**

1. Matrix Analysis of Framed Structures by **William Weaver and James M. Gere**
2. Numerical Models in Fluid-Structure Interaction by **S. K. Chakrabarti**
3. Fatigue Handbook: Offshore Steel Structures by **A. Almar-Naess**
4. Advanced Marine Structures by **S Chandrasekaran**

### **Prerequisite:**

Consent of teacher