ANALYSIS AND DESIGN OF MARITIME STRUCTURES

Introduction and Loading: Overview: fixed vs. compliant offshore structures, new-generation marine structures.

Environmental loads: wave, wind, current, ice, sloshing, and marine growth.

Accidental & random loads: slamming, wave impact, seismic, fatigue; Structural Analysis: Steel tubular members & tubular joint analysis for static and cyclic loadings, Structural behaviour under bending, columns, plastic design, buckling & failure mechanisms, Vibration, fatigue, fracture, dynamic responses under fluid-structure interaction; Design : Ultimate Limit State (ULS) design principles, partial safety factors, plastic capacity, Reliability methods for marine structures: FOSM, AFOSM, stochastic load modeling ; Modelling Tools and Applications: Finite element and stiffness methods for analyzing offshore structures (2D/3D), computational approaches via MATLAB

Motion response analysis: barges, jack-up rigs, TLPs, SPAR platforms, and RAO generation. Material behaviour in marine environments: corrosion, durability, NDT, monitoring sensor systems.