

SHIP THEORY

Ship Geometry and Hydrostatics :Ship lines and offset tables; Definitions of terms: waterlines, buttocks, sections; Hydrostatic calculations: volume, centroid, waterplane area, metacentric height; Bonjean curves and use in preliminary stability analysis; Numerical integration techniques for hydrostatics;Ship Stability (Static and Dynamic): Intact stability: small angle stability, large angle stability; Righting arm curve (GZ curve), KN curves; Stability criteria under various regulations (IMO, IS Code); Dynamic stability and energy consideration; Stability in waves, weather criterion; Ship Motions and Seakeeping: Degrees of freedom in ship motion; Response amplitude operators (RAO); Heave, pitch, roll: linear wave theory applications; Strip theory and simplified seakeeping methods; Introduction to time-domain simulation methods; Ship Manoeuvring and Added Resistance: Equations of motion for manoeuvring (MMG model basics); Turning circles, zigzag manoeuvres, course-keeping; Rudder-propeller interaction; Added resistance in waves; Basics of CFD methods in manoeuvring and seakeeping.