

## **OE3016: SHIP DESIGN**

### **Course Content:**

Marine transportation and trade routes, ship categorization - dead-weight carrier, capacity carrier, linear dimension ship; Service ships and offshore support vessels; Advanced marine vehicles; Ship design requirements. Ship design methods – design using basic type ships, design using coefficients, design using iteration methods; design spiral; Ship parameters – displacement, displacement coefficient, displacement equation, volume equation, solution of the cubic equation; Ship dimensions, hull form, form coefficients; Mass estimation - lightship mass – steel mass, outfit mass, engine plant mass; dead weight. Design of hull form – conventional method of lines, distortion of existing forms; stem and stern contours, bulbous bow.; General arrangement - Subdivision of the ship's hull and erections, arrangement of spaces, arrangement of tanks, superstructure and deckhouses, arrangement of engine plants, cargo handling capacity, hold capacity and stowage factor. Effect of form on Ship's performance: Freeboard and load line regulation; Stability – stability booklet, IMO Regulations, Checks on stability, trim; Watertight integrity; damage stability, Behaviour of ships in sea, resistance, powering, propulsion Cargo handling equipment, cargo hatches; Anchoring and mooring systems; Accommodation requirements, layout and design. Access equipment –hatches, manholes, doors, other closing & opening devices, load line rules, gang ways and ladders; LSA and FFA; Steering gear systems, navigational systems. Tender specification; Economic considerations in ship design and building; Operational Economics; Introduction to ship design softwares. Practicals: 1. Computer-Aided ship design - owner's requirement of ship (given), design of main dimensions, design of form, weight estimation, hydrostatics, checks on stability, trim, capacity, general arrangement, etc. 2. Practicals on softwares dealing with basic ship calculations and ship design.

### **Text Books:**

1. **D.G.M.Watson**, "Practical Ship Design", Elsevier 2002
2. Thomas Lamb, "Ship Design and Construction", SNAME 2003
3. Apostolos Papanikolaou, Ship Design: Methodologies of preliminary design, SNAME, 2014.

### **Reference Books:**

1. **Schneekluth, H**; Ship Design for Efficiency and Economy, Butterworths, 1987
2. **Taggart**; Ship Design and Construction, SNAME, 1980.
3. **IndraNath Bose**, Energy Efficiency and Ships, SNAME, 2012.
4. **Antony F Molland**, A Guide to ship design, construction and operation, SNAME, 2008

### **Prerequisite:**