

# AMSB13 MARINE ENGINEERING

## UNIT-1 INTRODUCTION TO MARINE ENGINEERING,

- 1.1 Marine Engineering and Naval Architect, Ships and machinery,
- 1.2 Design and selection considerations, IMO/MARPOL/SOLAS regulations.

## UNIT-2 MARINE DIESEL ENGINES

- 2.1 General engine principles, Low speed and medium speed diesel engines, Two Stroke cycles,
- 2.2 Four-Stroke cycles, Two/Four stroke engines, Scavenging and turbo charging, Fuel oil system,
- 2.3 Lubricating oil systems, cooling systems, torque and power measurement, Starting air systems and reversing systems, controls and safety devices, Couplings and Gearboxes,
- 2.4 Specific Fuel Consumption. Waste heat recovery system, MARPOL regulations and Energy Efficiency Design Index (EEDI), Ship Energy Efficiency Management plan (SEEMP).

## UNIT-3 MARINE STEAM TURBINES

- 3.1 Types of turbines, compounding, reheat, turbine construction, rotors, blades, casing, Gland sealing, diaphragms, nozzles, bearings etc.
- 3.2 Lubrication systems, expansion arrangements, Gearings.
- 3.3 Marine gas turbines- fundamentals of G.T, Structure of gas turbines, gearing, operational features, controls, combined cycles.
- 3.4 Nuclear propulsion- physical principles of the operation of nuclear reactors- use of nuclear propulsion on seagoing vessels, Electrical Propulsion,

## UNIT-4 MARINE BOILERS TYPES

- 4.1 Fire tube, water tube boilers, Package boilers, Cochran Boilers, Composite boilers, steam to steam generators, double evaporation boilers, exhaust gas heat exchangers,
- 4.2 Auxiliary steam plant systems, exhaust gas boilers, composite boilers.
- 4.3 Boiler mounting, combustion, feed system, feed water treatment.

## UNIT-5 ENGINE DYNAMICS

- 5.1 Torsional vibration of engine and shafting, axial shaft vibration, critical speeds, engine rating, rating corrections, trial tests etc.
- 5.2 Relationship of engine to the propeller classification society rules on engine construction, Engine room arrangement.
- 5.3 Automation of ship propulsion plants, Maintenance requirements and reliability of propulsion plants.

### Reference Books:

1. Doug Woodyard, Pounder's Marine Diesel Engines & Gas Turbines, 9th Edition, 2014
2. Harrington; Marine Engineering, SNAME Publications, 1992
3. Alan Rowen, Introduction to Practical Marine Engineering, 2005
4. Doug Woodyard, Pounder's Marine Diesel Engines & Gas Turbines, 9th Edition, 2014.