AMSB16 PROPULSION OF SHIPS

UNIT-1 PROPELLER AS A THRUST PRODUCING MECHANISM

1.1 Historical development; Screw propeller-screw propeller geometry, sections, propeller drawing, construction details.

1.2 Propeller theories-Momentum theory, Blade element theory, Circulation theory

UNIT-2 INTERACTION BETWEEN HULL AND PROPELLER

2.1 Wake and wake fraction, Resistance augment and thrust deduction factor, propulsive efficiency in open water and behind conditions,

2.2 Hull efficiency, quasi propulsive coefficient, transmission efficiency; Powering.

2.3 Cavitation-Types, Cavitation Number, Effects of cavitation, Prevention of cavitation, Design for minimum cavitation, Cavitation tests.

UNIT-3 DESIGN OF PROPELLERS

3.1 Propeller families and series; Open water tests-Presentation of data, Kt-Kq diagrams, Design charts- Bp-δ, T-J, P-J charts,

3.2 Use of charts in propeller design and performance study; Selection of engines-diesel engine characteristics.

UNIT-4 PROPELLER STRENGTH

4.1 Materials and their qualities, strength calculation. Model testing of propellers-Test facilities,

4.2 Laws of comparison, open water diagram self-propulsion tests-British and continental Methods.

UNIT-5 SHROUDED PROPELLER

5.1 Action of propeller in a nozzle, wake fraction and thrust deduction fraction in nozzles, load factor of nozzles, design of propeller-nozzle system, design charts.

5.2 Controllable Pitch propellers Advantages, special features in geometry, design aspects. Super cavitating propellers-application.

5.3 Other propulsion devices-Vertical axis propellers, Water jet propulsion, Sail, Paddle wheels, Electromagnetic propulsion etc.

5.4 Ship standardisation trials. Practicals: – Propeller design using series diagrams, screw propeller drawing.

Reference Books:

1. D.W. Taylor ; The Speed and Power of Ships ; A Manual of Marine Propulsion, Maritime Press, 2013
2. Anthony F. Molland ; Ship Resistance and Propulsion, Cambridge University Press; 2011
3. Dubrovsky. V ; Multi Hull Ships, Backbone Publishing Company .2011.
4. Justin E Kerwin, Jacques B Halder: Principles of Naval Architecture series -Propulsion, SNAME, New Jersey, 2010.