AMMV17 STABILITY OF SHIPS

UNIT-1 HYDROSTATICS

1.1 Density, relative density, pressure exerted by a liquid on an immersed plane,
1.2 Centre of pressure, load on immersed plane, load diagram,
1.3 Shearing forces on bulk head stiffeners– problems.

UNIT-2 GEOMETRY AND SHIP FORM CALCULATION

2.1 Archimedes principle, Laws of floatation, displacement, tonne per cm immersion.
2.2 Coefficients of form, wetted surface area, similar figures,
2.3 Shearing force and bending moment- problems.

UNIT-3 CALCULATION OF AREA, VOLUME, FIRST AND SECOND MOMENTS

3.1 Simpsons first rule and second rule, application to area and volume, use of intermediate ordinate rule, trapezoidal rule, mean and mid
3.2 Ordinate rule, application of 5 + 8 – 1 Rule for area, application of Simpson rule to first and second moments of area
3.3 Centre of gravity, effect of addition of mass, effect of movement of mass, effect of suspended mass – problems.

UNIT-4 TRANSVERSE, STABILITY AND HEEL

4.1 Static stability at small angles of heel, calculation of BM and meta centric height,
4.2 Meta centric diagram, inclining experiment, free surface effect, stability at large angles of heel,
4.3 Curves of static stability, dynamic stability, angle of loll, stability of a wall sided ship
4.4 Inclining experiment, problems. IMO recommendations concerning ship stability.

UNIT-5 LONGITUDINAL STABILITY

5.1 Longitudinal BM- MCT1 cm- Change of trim, change of LCB with change of trim,
5.2 Alteration of trim by adding or removing weights, mean draft,
5.3 Change in mean and end draft due to density and bilging
5.4 Flooding calculation- floodable length- factor of sub division- loss of stability due to grounding- problems- Knowledge of Trim and stress tables.

References Books:

1. Rawson, K.J.Tupper E.C, "Basic Ship theory", 5th Edition, Butter worth – Heinemann, London, 2001.
2. G.N.Hatch, "Creative Naval Architecture", 1st Edition, Thomas Reed Publications, London, 1971.