1. Title	Basic calculations for ship design
2. Code	EMSRDE301A
3. Range	Apply the basic knowledge of marine engineering, including geometry, calculations of ship area and volume, to daily tasks of calculations related to ship design.
4. Level	3
5. Credit	9
6. Competency	Performance Requirements 6.1 Basic knowledge of ship design ♦ Know about the descriptive terms and definitions of ship appearances • Overall length, length between perpendiculars, designed waterline length, mould depth and mould width • Moulded draught, maximum draught and mean draught • Waterline bow-to-stern hull and parallel middle body • Internal volume of a ship • Gross tonnage and net tonnage • Relevant symbols and marks ♦ Know about the coefficients related to ships • Block coefficient • Prismatic coefficient • Midship cross section coefficient • Water plane area coefficient • Vertical prismatic coefficient ♦ Know about buoyancy and hydrodynamics, such as: • Archimedes principle • Factors affecting the absolute pressure of fluids, such as acceleration due to gravity and depth from water level • Knowledge and calculation of centroids, such as centre of buoyancy and centre of gravity 6.2 Methods of using calculations for ship design ♦ Master ship calculations and data for analysis of design feasibility; calculations include: • Bonjean curve and its application • Application of displacement sheet • Calculation of the area, volume, centre of mass, torque and buoyancy of a ship 6.3 Professionalism in using calculations for ship design ♦ Apply relevant knowledge (such as hydrostatics and change of centre of buoyancy at draught and displacement) to analysis of actual navigation in addition to the use of primary data of ships

7. Assessment Criteria	The integrated outcome requirements of this unit of competency are: (i) Capable to calculate the area, volume, centre of mass, torque and buoyancy of a ship; and (ii) Capable to apply the above calculations to assist in ship design.
8. Remarks	The credit value of this unit of competency is set on the presumption that the person already possesses basic knowledge of calculations and physics.