

BSc (Hons) Maritime Science (Nautical and Engineering) modules

1. Mathematics

The primary aim of this module is to provide the fundamental analytical knowledge and techniques needed to successfully complete the core modules of the BSc in Maritime Science. Successful completion of the module enables the learners to use fundamental algebra, trigonometry, and calculus for the analysis, modelling and solution of realistic science and engineering based problems at levels 4 and 5.

Core Content

- Trigonometric and hyperbolic functions for engineering and nautical applications.
- Calculus differentiation techniques for technical analysis
- Calculus integration techniques for technical analysis

2. Introduction to marine management

This module provides the knowledge required to understand the regulations that govern international transport of goods and passengers by sea, to ensure the safe operation of the vessel and its crew. The module provides learners with the knowledge to apply leadership and management skills to the workplace to develop their own skills.

Core Content

- Marine legislation relating to maritime operations and management
- Principles of leadership and management techniques
- Health and Safety legislation pertaining to maritime operations
- Completion of an operational risk assessment

3. Naval Architecture and Stability

This module provides the knowledge required to understand the basic elements of the ship's structure regarding strength, and those factors influencing ship stability, resistance, powering and fuel consumption. It will provide learners with the knowledge of the fundamental design of vessels to ensure they withstand the forces on them during operation and in various sea states. Learners will undertake this module before their first sea phase thus various terms will be used that will unfamiliar so external visits to the local dockyards will be undertaken.

Core Content

- Understanding the construction forms and sections of general ship types
- Principles of hydrostatics
- Interpretation of general ship stability data
- Transverse stability calculations

4. Ship design and construction

This module provides the knowledge required to ensure the learner to understand the fundamental design of merchant vessels to ensure it is maintained and operated to prevent loss due to flooding or fire. The module will embed the knowledge and skills gained during the first study year as well as the first sea phase.

Core Content

- Principles of ship construction with regard to protection from fire and flooding

- Principles of ship construction to resist sea and cargo loading stresses
- Maintaining the strength of the ship structure through protection and inspection
- Ship design for contrasting specific duties of operation

5. Leadership and management

This module provides the knowledge required to manage and develop the safe and efficient operation of the vessel's officers and its crew. The module is aligned to the Leadership and Team Working Skills of Tables A-II/1 and A-III/1 of the STCW Code, as well as the Leadership and Managerial Skills of Table A-II/2 and A-III/2 of the STCW Code, as amended. The module will embed the knowledge and skills gained during the first study year as well as the first sea phase, and enable learners to reflect on their own observations of management styles seen during the first sea phase.

Core Content

- Principles of personnel management theory
- Resource management, including leadership and team working skills
- Managing quality assurance systems
- Auditing and reporting on quality assurance systems

6. Navigation B

This module aims to develop the learners' knowledge of the instruments, publications and processes required to successfully fix the ship's position and calculate compass errors using a range of celestial bodies. It will also introduce the learner to the theory and principles of celestial navigation, so they develop their understanding of the reasoning behind the processes, thus allowing them to successfully apply their underpinning knowledge at sea. The module further aims to provide an understanding of the general theory on the cause of tides, which includes calculations involving times and heights of tides worldwide.

Core Content

- Use and maintenance of relevant precision instruments.
- Principles and concepts of the celestial sphere to navigation techniques.
- Using celestial objects to find gyro and magnetic compass errors.
- Position fixing using a range of celestial navigation techniques.
- Theory of tides

7. Cargo Operations B and Stability

This module aims to provide the learner with an understanding of the principles of hydrostatics and statical stability together with an understanding of the application of the principles of transverse and longitudinal stability to establish a vessel's list, trim and draught. The learner will also have the ability to apply the theories and factors affecting stability and trim and analyse and appraise the factors affecting stability at moderate and large angles of heel. This module also provides the learner with an understanding of the processes and procedures involved when stowing and securing dry cargoes, stores and equipment, together with an understanding of the processes and procedures adopted when handling of gas, liquid and chemical cargoes. The module also enable learner to examine the planning and operational procedures for passenger operations.

Core content

- Theories affecting ship's stability.
- Trim and stability calculations.

- Calculations concerning stability at large angles of heel.
- Planning cargo (dry, bulk liquid and passenger) operations, including loading, discharging, securing.
- Cargo handling equipment and safe operating procedures.
- Calculation of cargo quantity