

MARITIME (MAR)

MAR 2203 Naval Architecture (3-1-3)

Introduce the maritime profession, including basic information on ship design/categorization, the ship building, designing and operating professions, an introduction to the rules and regulations governing maritime operations, including classification societies and IMO. An introduction to principal features of ships, including lines drawing. Covers hydrostatics, intact stability, small angle stability, cross curves and large angle stability. Free surface, list and loll angles, and trim. The concept of the trim and stability booklet is introduced, and its application explained.

Prerequisites: MTH 2103, MCE 2203, MCE 2223, MCE 3403

MAR 3103 Marine Machinery Systems (3-1-3)

Introduces machinery systems used on ships, both for main propulsion and auxiliary/hotel loads. Includes low speed diesels; medium speed diesels; steam turbines; gas turbines; boilers; electric propulsion; podded propulsion; bow thrusters; controllable pitch propulsion; scrubbers; pumping and piping; electricity generation; fuel supply; rudders and steering gear; cranes and other deck machinery; and automation issues.

Prerequisites: MAR 2203

MAR 3202 Ship Production (2-1-2)

Covers the overall philosophy and techniques for the manufacture of ships, including materials, welding, and cutting, shipyard practice and shipyard layout, with the differences between approaches for different ship sizes and types covered.

Prerequisites: MCE 2323, MAR 2203

MAR 3303 Resistance and Propulsion (3-1-3)

Covers an introduction to the resistance and propulsion of surface ships. It includes: components of resistance; Froude's law of similitude; the principles associated with model testing for resistance prediction; systematic series; ship-propeller interaction and an introduction to the use of Computational Fluid Dynamics, as applied to ship resistance prediction. Cover the concepts associated with the design of a ship's propeller including the principal features of propellers; the use of systematic series; and cavitation.

Prerequisites: MAR 2203, MTH 3013

MAR 3402 Ship Structures I (2-1-2)

Introduces rationally based structural design and optimization for ships. Loading and responses in ship structures. Bending of the hull girder, and hull girder response. Application of beam theory to typical ship types, including those with open decks. Fatigue and fracture of ship structures, including an introduction to fracture mechanics.

Prerequisites: MCE 2203, MTH 2503, MCE 2223, MCE 2213, MCE 2311

MAR 3503 Design of Ships and Maritime Structures (3-1-3)

Introduces the fundamental aspects of the rational engineering approach to, and issues which influence, the design of ships and maritime structures. CAD skills as applied to ship design, including specific commercial modelling software are introduced.

Prerequisites: MAR 3103, MAR 2203, MCE 2203, MCE 2223, MCE 2213, MCE 2403, MCE 2311

MAR 4423 Coastal Engineering and Maritime Structures (3-1-3)

Includes an introduction to the study of processes ongoing at the shoreline and within the coastal zone. Longshore and cross-shore currents are covered, including their effect on sand transport and beach erosion. Covers the design of typical maritime coastal structures, including: breakwaters; groins; jetties; and sea walls.

Prerequisites: MAR 2203, MAR 4833

MAR 4433 Offshore Engineering (3-1-3)

Introduces offshore engineering, including the design of offshore platforms for oil and gas exploration and production. Includes an introduction to subsea engineering, including subsea completions and pipelines on the seabed.

Prerequisites: MAR 2203, MAR 3402, MAR 3503, MAR 4833

MAR 4443 Ship Production II (3-1-3)

Covers advanced ship production techniques, following on from MAR 3202, Ship Production. It focusses on efficient shipyard layout and ship production techniques, making use of international best practice, as applied in the UAE context. Economic aspects of ship production, and shipyard practices are also included, as well as project management, as applied to ship production.

Prerequisites: MAR 2203, MAR 3202, MAR 3402, MAR 3503

MAR 4453 Ship Repair (3-1-3)

Focuses on ship repair techniques, including regular maintenance, following on from MAR 3203, Ship Production. Ashore and afloat techniques are included, and issues associated with both are discussed in detail. Project management techniques used for ship repair are also covered.

Prerequisites: MAR 2203, MAR 3202, MAR 3402, MAR 3503

MAR 4463 Port Engineering (3-1-3)

Covers the planning and engineering of ports and harbours. Ship berthing and manoeuvring aspects are covered, including the need for, and the design of, navigation aids. Engineering issues associated with the design of different types of marine terminals (container, dry bulk, and liquid bulk, including gas) are included.

Prerequisites: MCE 2213, MAR 2203, EGN 3012

MAR 4703 Shipping Management (3-1-3)

Introduces the technical and operational aspects of ship management. The operations that are necessary to transport cargo in a safe, efficient, and commercially viable manner are included. Nautical, commercial and cargo operations are examined in detail. The course also examines the concepts which underpin ship operations, including: asset maintenance; quality management; and risk management.

Prerequisites: LGE 2003

MAR 4803 Ship Structures II (3-1-3)

Introduces theories and concepts to describe and analyse the dynamic response of ship structures. Apply analytical models to the design of ship structures, and explore the use of simple and advanced methods to obtain internal forces and displacements, as well as buckling loads. Covers statistical predictions of wave-induced loads and hull girder response. Includes load cases prescribed by Classification Societies, and the application of Classification Society rules to ship structures.

Prerequisites: MAR 3402

MAR 4805 Maritime Design Project I (5-1-5)

Covers the knowledge and capabilities developed during the previous years on the program, as applied to the design of a ship and associated machinery systems.

Prerequisites: MAR 2203, MAR 3103, MAR 3202, MAR 3402, MAR 3503, EGN 3012, EGN 3212

MAR 4833 Seakeeping and Manoeuvring (3-1-3)

Covers an introduction to ocean waves; the prediction of ship motions in regular waves (both experimentally and numerically); statistical approaches to assessing the motions of a ship in a seaway, motions criteria, and introduction to ship manoeuvring in open and in restricted water, including the concepts of ship-ship interaction.

Prerequisites: MAR 2203, MAR 3503, MTH 2503, MTH 1113

MAR 4853 Marine Surveying (3-1-3)

Covers introduction to the principles of ship and engine surveying, as required by a marine surveyor, issues associated with surveying for new build and/or repair in a shipyard and those associated with ongoing surveys, and port state control.

Prerequisites: MAR 3402

MAR 4865 Maritime Design Project II (5-1-5)

Covers the knowledge and capabilities developed during the previous years on the program, as applied to the design of a ship and associated machinery systems.

Prerequisites: MAR 4805, MAR 4833

MAR 4883 Maritime Transportation (3-1-3)

Introduces to the economic principles of commercial shipping practice. Includes the basics associated with ship ownership, ship chartering, and commercial ship operation. Covers the principles of international trade, international commerce, the key trade routes, and the role of shipping in an integrated multi-modal supply chain.

Prerequisites: EGN 3212

MAR 4903 Marine Safety (3-1-3)

Covers the issues associated with marine safety, including the concepts of risk management, designing for safety, maritime safety regulations, and classifications societies. Discuss case studies based on maritime accidents, and their subsequent effect on maritime regulations and accident investigation procedures are also covered.

Prerequisites: MAR 2203, MAR 3503