

# NSE - NAVAL (NSE)

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## **NSE 1003 Fluid Mechanics for Naval Applications (3-1-3)**

This course will provide basic understanding of the principles of fluid mechanics, fluid properties, pressure measurements and its applications. The students will also learn about the concept of buoyancy and stability as applied to naval ships. In addition, students will be familiarized with the concept of continuity, energy conservation equations and their practical applications.

**Prerequisites:** PHY 1103

## **NSE 1013 Damage Control (3-1-3)**

The course aims at providing the students with the knowledge about the ship structure, materials used in Naval ship construction and guidelines for basic ship design and construction process. The course also covers basic knowledge of Nuclear, Biological and Chemical Defence and Damage control including Fire Fighting (NBCD) onboard warships encompassing basic concepts of NBCD and basic terminology related to NBCD. It also gives detailed information about the basics of Nuclear, biological and chemical warfare and defence against NBC attacks.

## **NSE 2003 Ship Electrical Technology (3-1-3)**

This course introduces the basic principles of electrical circuits applied to modern naval ships. Topics include introduction to AC and DC fundamentals, battery theory, open and close loop control systems, electrical machines, power and generation systems, power system automation, transmission/distribution systems and the correlation of these systems to onboard naval ships.

**Prerequisites:** PHY 1103

## **NSE 2013 Principles of Naval Sensors (3-0-3)**

The course is designed to introduce the basic concepts of Naval Sensors and their applications to naval operations and warfare. It starts with the definitions and concepts of Radio and Soundwaves and their propagation mechanisms. Various types of Radars, Sonars, and Electrooptical sensors are described. Their applications are explained to familiarize the students with the roles of these sensors in naval scenarios.

## **NSE 2023 Oceanography and Meteorology (3-1-3)**

This course introduces basic meteorology and oceanography concepts, which impact naval operations at sea. The oceanography segment provides a comprehensive introduction to different branches of Oceanography; physical and geological, with particular emphasis on the Arabian Gulf. In Meteorology, students will acquire this knowledge by studying all weather-related topics such as the structure of the atmosphere, the air and water movements, the temperature, the pressure, the wind, the clouds, the air masses, the weather fronts, and tropical revolving storms and avoidance.

## **NSE 2033 Principles of Naval Architecture (3-1-3)**

The course aims at providing the students with the knowledge about the Ship Structure & DC on basic concepts of ship stability and also about material used onboard ship including its preservation. It also aims to provide the information regarding basic stability conditions. It also covers effects of various loading conditions and methods to calculate stability in case of damage to the ship structure. Finally, students will also be given practical demonstrations of various loading conditions and states of a ship in laboratory environments.

## **NSE 2043 Ship Propulsion I (3-1-3)**

The course aims at providing the students with comprehensive knowledge of Marine Engineering Systems onboard warships with special emphasis on theoretical concepts and their application. In this course, students will learn administrative and functional organization of the Marine Engineering department onboard warships. It will also cover the working and components of conventional heat engines, propulsion and transmission systems, and combinations/configurations of engines and the transmission system.

**Prerequisites:** NSE 1003

**Corequisites:** NSE 1013

## **NSE 2103 Ship Propulsion II (3-1-3)**

This course aims at providing students with knowledge of the latest developments in propulsion systems, and of important auxiliary machinery/equipment fitted on warships. The course covers the latest developments in propulsion engine technology, such as water jet and electric propulsion systems, and descriptions of auxiliary machinery fitted onboard warships, such as refrigeration and air conditioning systems, the firemain system, desalination plants and steering systems.

**Prerequisites:** NSE 2043, NSE 1013

**Corequisites:** NSE 2033

## **NSE 2203 Electronics for Naval Applications (3-1-3)**

Most modern marine equipment, consumer devices, communication systems and sensors use electronic devices, both digital and analog components. Learning their fundamental principles is essential in order to allow students to understand the concept and applications of basic electronics. Topics include passive and active semiconductor components and their operations, including PN junctions, diodes, transistors (BJTs and JFET), thyristors, converters and rectifiers, basic amplifiers, digital systems, logic gates, numbering systems and Boolean expression.