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| Course Title | **Ship Steering Control Systems** |
| Course Code | MANS-323 |
| Course Type | Elective |
| Level |  |
| Year / Semester | 3rd Year, Fall Semester |
| Teacher’s Name |  |
| ECTS | 4 | Theory | Laboratory | Simulation | Tutorial |
| 2 | --- | --- | ---- |
| Course Purpose and Objectives | The main objectives of the course are to:* Understand the principle and operation of the ship magnetic compasses and the ship gyrocompass
* Ensure knowledge of the proper use of such compasses and understand the main advantages and disadvantages.
* Understand the principle and operation of the different types of automatic steering control systems on a ship.
* Be able to use safely such systems with all its components
* Ensure a thorough knowledge of the IMO regulations that govern such systems
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| Learning Outcomes | After completion of the course students are expected to be able to: * Thoroughly understand the principle of operation and characteristics of ship magnetic compasses with all advantages and disadvantages associated with them.
* Thoroughly understand the principle of operation and characteristics of ship gyrocompasses with all advantages and disadvantages associated with them.
* Be able to make necessary corrections and adjustments as required.
* Understand the different types of steering control systems available on a ship
* Thoroughly understand the principle of operation such ship control systems with all its parts and components
* Be able to use competently both manual and automatic steering control systems.
* Show an in depth understanding of the relevant IMO Regulations governing such systems.
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| Prerequisites | None | Required | None |
| Course Content | **Magnetic compasses*** Parts, characteristics, principle of operation
* Errors and adjustments
* The use with the ship steering control system.
* Advantages and disadvantages
* Potential and Limitations

**Gyrocompasses*** Types of Gyrocompasses
* Installation, Parts, characteristics, principle of operation
* Errors and adjustments
* The Gyro Recorder
* The use with the ship steering control system.
* Advantages and disadvantages
* Potential and limitations

**Steering Control Systems****Characteristics*** Types and characteristics of steering control systems
* Manual and automatic systems
* Installation and main part description
* Steering engine control linkage
* Rudder Plate and Rudder angle transmitter
* Feedback control unit

**Operation*** Follow-up (FU) and Non-Follow-Up–(NFU)
* Autopilot system
* Control consideration and alarm signals
	+ Permanent Helm
	+ Rudder Control
	+ Rudder Counter
	+ Rudder Alarm Limit
	+ Rudder Angle Adjustment
	+ Weather Adjustment or Steering Control.
	+ Wheel Dead Band
	+ Steering Gear Pumps
	+ Off Course Alarm
	+ Manual Mode
	+ Traffic Density
	+ Speed
	+ Potentials and important limitations

**IMO Regulations** * + Annex 18 - Steering Gear, Heading and Track Control Systems
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| Teaching Methodology | Lectures, in-class assignments, sound and video equipment, computer, projector, field training  |
| Bibliography | 1. **Required Textbooks/Reading:**

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| --- | --- | --- | --- | --- |
| **Authors** | **Title** | **Publisher** | **Year** | **ISBN** |
| Stefani, Alex | An Introduction to Ship Automation and Control Systems | Witherby Seamanship International | 2022 | 9781914992384 |

1. **Recommended Textbooks/Reading:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Authors** | **Title** | **Publisher** | **Year** | **ISBN** |
| W. Burger  | Marine Gyro-Compasses and Automatic Pilots: A Handbook for Merchant Navy Officers  | Pergamon | 2014 | 978-1483122823 |

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| Assessment | Homework, in-class assignments, projects, midterm, final exam. |
| Language | English  |