#### **SHIP DESIGN**

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**Partner universities:** 

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# **SHIPMARTECH**

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# Ship Design

- ▶ 6 ECTS (150h)
- Work load: 48 hours of frontal lessons + 102 self-study
- Prerequisites/ co-requisites:
  - Ship Stability Resistance Propulsion -Seakeeping-
- Masters' mandatory course

# **Objectives**

- Adequate knowledge of the various aspects of the ship design:
  - Data base analysis and comparison with reference ships;
  - Main dimension and displacement evaluation and hull form definition. Preliminary layout and GA plans.
  - Powering and maneuverability performances assessment
  - Regulatory frameworks references, including the most recent relating to environmental sustainability.
- Adequate knowledge of technical and design aspects of environmental indexes and zero emission capabilities.
- General knowledge of the interaction between ship design and ship management. Energy saving issues.
- Basic knowledge of future scenarios of ship propulsion.

### Intended Learning Outcome (ILO)

At the end of the course the student will have to demonstrate that he is able to set up the preliminary design of a ship on the basis of defined functional specifications and/or mission profiles.

# Teaching and learning formats and methods

- Development is promoted through the following teaching and learning methods:
  - The student attends the class presentations and guest lectures.
  - The student chooses a reference ship among a given list and develops a basic design on the basis of a mission profile defined together with the teacher.

# Learning resources, readings, references

- Illustrative slides of the lessons available on the Teams channel of the course of each academic year
- References for Displacement assessment, Powering performances and Maneuverability Assessment available on the Teams channel of the course of each academic year
- Apostolos Papanikolaou, Ship Design Methodologies of Preliminary Design, Springer
- A Seaman's Dictionary by Ranger Hope (2007)

### Assessment

Final mark is obtained as combination of the technical report, a seminar presentation, reading notes and a work diary.

Assessment tool	Mark
Course oral exam	<b>60</b> %
Basic design presentation	40 %
Total	100%

### Lecture topics

- 1-Present scenarios for Ship Designers
- 2-Basic Ship Features DWT and Volumetric Ships Meaningful Parameters
- > 3-First steps in design procedure Main dimensions evaluation for DWT ships
- 4-Volumetric and other types of ships Peculiar Characteristics and Main Dimensions Evaluation
- 5-Containerships: Peculiar Characteristics and Main Dimensions Evaluation
- 6-Data base Analysis and MultiAttributeDecisionMaking for Ranking Existing Ships
- > 7-Hull form elements Hullform Representation and Modification
- 8-Load line, Tonnage and Regulatory frame
- 9-High Speed Craft and Small Craft
- 10-Hybrid and alternative auxiliary propulsions Zero Emission Capabilities Future Scenarios
- 11-Ship Design to Ship Management Energy Savings
- 12-Wellness and comfort onboard
- 13-APPENDIX 1 References for Displacement Prediction
- 14-APPENDIX 2 References for Powering Prediction
- 15 APPENDIX 3-References for Manouvrability Assessment
- ► 16-Basic design WORKSHOP-Notes for Development and Presentation

# Course project

- Student will be provided with licence keys for AUTOSHIP AUTOHYDRO -AUTOPOWER
- Student will be provided with ELIWAG sw for propeller calculations
- Student will be provided with Excel files for Holthrop and Mennen's and Savitsky's procedures
- Student will be provided with Excel files for Batteries calculation in ZERO-EMISSION CAPABILITIES assessment