FA2 Marine Engineering

LEARNING OBJECTIVES

The Marine Engineering track seeks to equip mechanical engineers with a comprehensive skill set that spans various disciplines within the field, including naval architecture, shipbuilding, advanced mechanical design, and the physics and materials of the marine environment.
To achieve this goal, students of this program are required to take specific courses on naval architecture and construction, as well as elective courses on naval project design and management, propulsion systems, the physics of the sea and waves, and surfacing and material modelling for marine applications.
Additionally, there are courses available on techniques for measuring vibration, noise, and comfort, system reuse and recycling, and industrial project management. Moreover, students have access to a wide range of elective courses that allow them to delve deeper into areas such as electronics, design, modelling, and innovation.

PRE-REQUISITES

No specific prerequisites are necessary for students who choose the Marine Engineering track, although having a strong foundation in the mathematical and physical sciences is highly recommended. Additionally, an in-depth understanding of fluid dynamics and structural physics will greatly benefit students in their studies. Cultivating a sense of curiosity is also essential, as it enables students to approach and tackle complex, interdisciplinary, and multidisciplinary problems with enthusiasm and determination.

FA2 Marine Engineering

LEARNING OUTCOMES

Mechanical engineers specializing in Marine Engineering are highly skilled professionals with diverse knowledge and expertise. Through extensive study of various disciplines, including naval architecture, shipbuilding, and onboard systems, they possess the ability to tackle complex theoretical and practical challenges in both traditional and cutting-edge mechanical applications, all of which are crucial in the marine industry.

JOB OPPORTUNITIES

The Marine Engineering track equips students with the necessary skills to pursue careers in companies involved in designing and manufacturing various mechanical components for the maritime, naval, and nautical industries. These industries rely on mechanical engineering expertise to develop and produce boats, systems, and products that incorporate sensors, propulsion systems, and control mechanisms. The demand for mechanical engineers spans a wide range of companies across these sectors.

PARTNER UNIVERSITIES

The Marine Engineering track offers numerous opportunities with renowned international universities. To provide a glimpse of the possibilities, we highlight some of the institutions where students have the opportunity to carry out their thesis research. These include École nationale supérieure de techniques avancées Bretagne (ENSTA Bretagne, France), Technische Universität Berlin (TU Berlin, Germany), Universidade da Coruña (UDC, Spain), Chalmers Tekniska Högskola (Chalmers, Sweden), and Technische Universiteit Delft (TU Delft, The Netherlands). These esteemed academic partners ensure that students benefit from a diverse and enriching educational experience beyond our institution.

FA2 Marine Engineering

1 YEAR COURSES
60 ECTS

40 ECTS

	ECTS
Energy Conversion Technologies	5
Data Analysis for Future Transportation Systems	5
Control of Mechanical Systems	5
Advanced Dynamics of Mechanical Systems	10
Advanced Machine Design	10
Advanced Manufacturing Processes B	5

20 ECTS

	ECTS
Naval Hydrostatics and Hydrodynamics	10
Ship Structural Analysis and Design	10

FA2 Marine Engineering

2 YEAR COURSES

40 ECTS + 20 ECTS Master's Thesis

15 ECTS

	ECTS
Maritime Hydraulics	5
Ship Design and Project Management	5
Marine Propulsion Technology	5
Experimental Techniques for Vehicles Noise, Vibration and Harshness	5
Surface Modeling for Engineering Applications	5
De-manufacturing	5
Industrial Project Management A	5
Materials for Sustainable Transportation Systems	5

5 ECTS

	ECTS
LAB - Physis PEB	5
LAB - Wind Energy	5

5 ECTS

	ECTS
Open Couse	5

FA2 Marine Engineering

15 ECTS

	ECTS
Computational Fluid Dynamics - Experimental Assessment	5
Advanced Human Machine Interfaces	5
Computational Fluid Dynamics - Fundamentals	5
Machine Learning for Mechanical Systems	5
Mechatronic Systems B	5
Noise and Vibration Engineering	5
Nonlinear Dynamics and Chaos	5
Rotordynamics and Diagnostics B	5
Wind Engineering	5
Advanced Design of Machine Elements	5
Finite Element Simulation for Mechanical Design	5
Impact Engineering	5
Lightweight Design of Mechanical Structures - Composite Structures	5
Lightweight Design of Mechanical Structures - Fundamentals	5

FA2 Marine Engineering

	ECTS
Non-Destructive Testing and Evaluation for Materials and Components	5
Modelling of Mechanical Behaviour of Materials	5
Reliable and Resilient Design of Mechanical Systems	5
Fondamenti di balistica ed esplosivistica B	5
Intellectual Property and Patents in Innovation	5
Reverse Engineering	5
Design and Analysis of Experiments	5
Quality Data Analysis B	5
Repairing and Re-manufacturing Processes	5
Applied Project Management *	5
Industrial Asset Management	5
Production Management	5
Smart Maintenance Management	5
Solidification and Welding Metallurgy	5
Electrical Drives for Industry and Transport Applications	5
Agile Innovation	5

FA2 Marine Engineering

	ECTS
Failure Analysis, Sicurezza Industriale e Ingegneria Forense	5
Communication Technologies for Industrial and Vehicle Engineering	5
One (or more) of the above courses of 5 ECTS	5