



# UNIVERSITÀ DEGLI STUDI DI PALERMO

**Department: Engineering**

**A.Y. 2022/2023**

## **DEGREE COURSE IN MARINE TECHNOLOGIES ENGINEERING - SEA TECHNOLOGIES ENGINEERING -**

### **Characteristics**



Class of Bachelor's Degree  
(BSc) on Industrial  
engineering (L-9)



3 YEARS



TRAPANI



FREE ACCESS



2253

### **Educational objectives**

The course aims at training professionals responding to the needs of the labour market in the fields of industrial production, production of energy from the sea, industry of marine extractions, movement of goods and passengers and of the design of works aiming at the protection of the coasts.

In line with the provisions of the qualifying educational objectives for graduates in the L-9 degree class, “Industrial Engineering”, graduates in “Marine Technologies Engineering” will have adequate knowledge of the methodological-operational aspects of mathematics and other sciences and will be able to use this knowledge to interpret and describe engineering issues.

The specific objectives of the course are based on a training path, starting with a solid basic training built on disciplines such as mathematics, physics, chemistry, which develops on the design skills deriving from the main engineering disciplines. Among these, the disciplines related to the mechanical engineering, manufacturing and plant engineering sectors take on particular importance. The methodological-operational aspects of sciences, namely of industrial engineering, will be deeply investigated, in a way to enable graduates to identify, formulate and solve problems using up-to-date methods, techniques and tools.

Furthermore, the degree course provides, basic and typical industrial engineering subjects, the training of an engineer with solid groundings and soft skills, so as to be able to access different 2nd cycle Degree courses. At the same time, the course integrates some subjects with specific professional nature, with respect to the industrial sector and marine applications, providing tools that can be used in numerous sectors of the industrial sector, from manufacturing to transformation. Finally, thanks to the multidisciplinary studies in the field of marine technologies, graduates will be able to have a wealth of knowledge that can be spent on the territory, becoming a precious regional asset.

To achieve the objectives, the degree course is divided into the following subject blocks:

- Basic subjects (mathematics, physics and chemistry)
- The typical industrial engineering subjects (construction theory, technical physics, electrical engineering, fluid mechanics, drawing, measurements)
- The specific and professional industrial engineering subjects (including mechanical systems, applied mechanics, manufacturing processes, machines and propulsion systems)
- The disciplines more directly related to applications in the marine environment.

The course does not provide diversified curricula, but two optional teachings packages from which the student will have to choose one and two disciplines respectively. In particular, among the subjects related to the marine environment, some are common/mandatory courses, such as coastal geomorphology, marine geology and the study of maritime works aimed at coastal defence; others, on the other hand, are included as optional, enabling students to study in depth their applications in the fields of mechanical design, production of clean energy from the sea and marine ecology (through class-specific and related educational activities).

Students can select some additional optional disciplines for the deepening of knowledge about business economics and organization and maritime law.

### **Professional opportunities**

Legenda: Per. = periodo o semestre, Val. = Valutazione (V=voto, G=giudizio), TAF= Tipologia Attività Formativa (A=base, B=caratterizzante, C=Affine, S=stages, D=a scelta, F=altre)

Profile:

1st cycle graduate in Marine Technologies Engineering

Functions:

Graduates in Marine Technologies Engineering integrate the skills of industrial engineering with technological skills related to the marine environment, thus favouring a response to the need for soft skills indispensable in the current industrial production framework.

They are professionals with solid technical and methodological groundings who, thanks to the engineering approach to the problems and the soft skills, act as valid interlocutors among the various actors, favouring a more effective solution to the problems.

Skills:

The course prepares for the working contexts with precise specific and soft skills, providing graduates with a versatile and spendable approach in different contexts. This latter is based on the methodological rigor typical of the engineering approach and on the development of specific skills through the preparation of group works, the presentation of projects and the discussion of case studies. The skills of graduates in Marine Technologies Engineering are related to: the product and or process innovation in the industrial sector; the processing of raw materials; the operation of devices, machines and systems; geometric modelling and mechanical design of single components or more complex structures, through the use of modern digital tools such as CAD modelling and numerical analysis software (FEM, CFD); the issues related to the interaction between wave motion and coastal dynamics, with particular regard to erosion phenomena; the sustainability of food supply chains based on the production of sea proteins (e.g. fishing and aquaculture); the feasibility and the most appropriate technological solutions for the production of renewable energy, desalinated water and raw materials from the sea, taking into account the environmental peculiarities of the site.

Professional opportunities:

Graduates in Marine Technologies Engineering will find many professional opportunities, ranging from mechanical and electromechanical industries, companies and entities operating in the energy sector, to manufacturing companies and technical offices of Public Administrations. Furthermore, the skills acquired in areas strictly related to the marine professions will enable them to carry out their activity in companies operating in the plant and port sector, shipyards, fish farming companies and shipping companies. Passing a state exam for the qualification to exercise the profession of engineer, by enrolling in the register of "Junior Engineers", they will be also able to work as freelance in the field of technical consulting. The Degree also prepares for the access to 2nd cycle Degrees mainly (but not exclusively) in the field of Industrial Engineering.

#### Final examination features

To obtain the degree, students must have acquired 180 credits including those relating to the final examination (3 credits). The final aims at assessing the level of maturity and critical skills of the undergraduate, with respect to learning and to the acquired knowledge, on completion of the activities provided by the educational programme. The final examination consists of the preparation, also through multimedia software, of a paper about an issue chosen by the student from a list prepared by the Degree Course, consistent with the Course educational objectives. The candidate will make a presentation of the selected topic, followed by the discussion with the examining Board. The examination procedures will be specified in the regulations on the final exam of the degree course, which will be made available on the Course website. During the final examination, students must demonstrate their ability to analyse, deepen and critically re-elaborate the chosen topic.

Subjects 1 <sup>o</sup> year	CFU	Sem.	Val.	SSD	TAF
02605 - COMPUTER AIDED DESIGN <i>Mancuso(PO)</i>	9	1	V	ING-IND/15	B
19109 - MATHEMATICAL ANALYSIS - INTEGRATED COURSE	12	Ann.	V		
- MATHEMATICAL ANALYSIS - MODULE 1 <i>Dalla Riva(PA)</i>	6	1		MAT/05	A
- MATHEMATICAL ANALYSIS - MODULE 2 <i>Rizzo(RD)</i>	6	2		MAT/05	A
15540 - PHYSICS I <i>Grammatta(PC)</i>	9	1	V	FIS/03	A
20465 - PRINCIPLES OF CHEMISTRY FOR TECHNOLOGIES - INTEGRATED COURSE	15	Ann.	V		
- CHEMISTRY FOR ENGINEERING <i>Muscolino(RD)</i>	9	1		CHIM/07	A
- TECHNOLOGY OF MATERIALS <i>Valenza(PO)</i>	6	2		ING-IND/22	B
03675 - GEOMETRY <i>Spadaro(PA)</i>	6	2	V	MAT/03	A
07870 - PHYSICS II <i>Marino(RD)</i>	6	2	V	FIS/01	A

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Subjects 1 ° year	CFU	Sem.	Val.	SSD	TAF
04677 - ENGLISH LANGUAGE <i>Spezzano(PC)</i>	3	2	G		E

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Subjects 2 ° year	CFU	Sem.	Val.	SSD	TAF
02965 - ELECTRICAL DEVICES AND CIRCUITS <i>Pellitteri(RD)</i>	9	1	V	ING-IND/31	B
06313 - MECHANICS OF MATERIALS AND THEORY OF STRUCTURES <i>Spada(PA)</i>	9	1	V	ICAR/08	B
21654 - FLUID MECHANICS AND MARITIME HYDRAULICS <i>De Marchis(PA)</i>	9	2	V	ICAR/01	C
05269 - MECHANIC AND THERMAL MEASUREMENTS <i>D'Acquisto(PO)</i>	6	2	V	ING-IND/12	B
03871 - MECHANICAL PLANTS <i>Longo(PC)</i>	6	2	V	ING-IND/17	B
04925 - MECHANICS APPLIED TO MACHINES <i>Castellano(PC)</i>	6	2	V	ING-IND/13	B
03318 - TECHNICAL PHYSICS <i>Piacentino(PO)</i>	9	2	V	ING-IND/10	B
Free subjects	12				D

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Subjects 3 ° year	CFU	Sem.	Val.	SSD	TAF
21652 - COAST PROTECTION, COASTAL GEOMORPHOLOGY AND MARINE GEOLOGY - INTEGRATED COURSE	15	1	V		
- COASTAL GEOMORPHOLOGY <i>Cappadonia(PA)</i>	3	1		GEO/04	C
- COASTS PROTECTION <i>Ciraolo(PO)</i>	9	1		ICAR/02	C
- MARINE GEOLOGY <i>Sulli(PO)</i>	3	1		GEO/02	C
21645 - MACHINES AND PROPULSION SYSTEMS <i>Pipitone(PO)</i>	6	1	V	ING-IND/08	B
07324 - MECHANICAL TECHNOLOGY <i>Di Lorenzo(PO)</i>	9	2	V	ING-IND/16	B
05917 - FINAL EXAMINATION	3	2	V		E
Optional subjects	6				B
Optional subjects II	12				C
Stage and others	3				F

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## OPTIONAL SUBJECTS

Stage and others	CFU	Sem.	Val.	SSD	TAF
21704 - INNOVATIVE FISH PRODUCTIONS - LABORATORY <i>Messina(PO)</i>	3	1	G		F
21167 - INTERNSHIP 2 CREDITS	2	1	G		F
11033 - INTERNSHIP 3 CREDITS	3	1	G		F

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<b>Stage and others</b>	<b>CFU</b>	<b>Sem.</b>	<b>Val.</b>	<b>SSD</b>	<b>TAF</b>
11034 - OTHER EDUCATIONAL ACTIVITIES - 1 CREDIT	1	1	G		F
11035 - OTHER EDUCATIONAL ACTIVITIES - 2 CREDITS	2	1	G		F
11036 - OTHER EDUCATIONAL ACTIVITIES - 3 CREDITS	3	1	G		F
<b>Optional subjects</b>	<b>CFU</b>	<b>Sem.</b>	<b>Val.</b>	<b>SSD</b>	<b>TAF</b>
21651 - MECHANICAL DESIGN <i>Pitarresi(PO)</i>	6	1	V	ING-IND/14	B
21650 - MECHANICAL STRUCTURE MODELING FOR THE SEA <i>Mancuso(PO)</i>	6	1	V	ING-IND/15	B
<b>Optional subjects II</b>	<b>CFU</b>	<b>Sem.</b>	<b>Val.</b>	<b>SSD</b>	<b>TAF</b>
02779 - BUSINESS ECONOMICS AND ORGANISATION	6	1	V	ING-IND/35	C
21646 - ENERGY PRODUCTION FROM THE SEA <i>Curto(RD)</i>	6	1	V	ING-IND/11	C
02476 - MARITIME LAW <i>Romana(RU)</i>	6	1	V	IUS/06	C
21649 - PRINCIPLES OF ECOLOGY AND APPLICATION IN THE MARINE FIELD <i>Sara'(PO)</i>	6	1	V	BIO/07	C
21653 - TECHNOLOGIES FOR THE PRODUCTION OF FRESH WATER AND RAW MATERIALS FROM THE SEA <i>Micale(PO)</i>	6	1	V	ING-IND/26	C

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