UNIVERSITÀ DEGLI STUDI DI TRIESTE

Dipartimento di Ingegneria e Architettura

MASTER'S DEGREE IN

MECHANICAL ENGINEERING

CLASS LM-33

for students enrolling in the 1st year of the academic year 2025-2026

The Master's Degree in Mechanical Engineering provides two curricula:

- MECHANICAL DESIGN AND PROTOTYPING
- ENERGY AND SUSTAINABILITY

The courses are classified according to the type of training activity (TAF):
A = basic teaching activities
B = core teaching activities
C = similar/complementary teaching activities
D = elective/optional teaching activities chosen by the student
E = final examination
F = other activities

The courses are taught in Italian, except where otherwise noted.

MECHANICAL DESIGN AND PROTOTYPING Curriculum				
1st year (54 CFU)				
Course	*Modules*	*Sector*	*TAF*	*CFU*
Machine design		ING-IND/14	B	9
Fundamentals of thermo-fluid dynamics for machinery		ING-IND/08	C	9
Vibration mechanics		ING-IND/13	B	9
Computational Fluid Dynamics and Heat Transfer (in English)	Introduction to Computational Fluid Dynamics	ING-IND/10	B	3
	Computational Methods for Fluid Dynamics and Heat Transfer	ING-IND/10	B	6
Integrated CAD/CAE mechanical design		ING-IND/15	B	6
Fundamentals of electrical drives and systems		ING-IND/32	C	6
Elective educational activities chosen by the student			D	6
2nd year (66 CFU)				
Course	*Modules*	*Sector*	*TAF*	*CFU*
Fundamentals and methods for design		ING-IND/08	B	9
Mechanical plants		ING-IND/17	B	9
Machinery project		ING-IND/08	B	9
Mechanical design with advanced materials and additive manufacturing		ING-IND/14	B	6
Robotics (in English)		ING-IND/13	B	6
Health and safety at the workplace		ING-IND/35	F	6
Elective educational activities chosen by the student			D	6
Internship			F	6
Final examination			E	12

In the Study Plan of the MECHANICAL DESIGN AND PROTOTYPING curriculum there are some Elective educational activities chosen by the student (TAF D). The choice of these modules is free, but it must be coherent with the educational project. Coherence will be assessed case-by-case by the Board of Studies of Mechanical Engineering.

The approval will be automatic if the modules are chosen among those shown in the following table:

ELECTIVE COURSES of MECHANICAL DESIGN AND PROTOTYPING Curriculum			
Course	*Sector*	*TAF*	*CFU*
Buildings HVAC Systems (in English)	ING-IND/11	D	6
Economic evaluation of plans and projects	ING-IND/17	D	6
Elements of Fluid machinery and Energy Systems (in English)	ING-IND/09	D	6
Emission abatement systems	ING-IND/17	D	6
Hydrogen and fuel cells (in English)	ING-IND/08	D	6
Industrial energy management (in English)	ING-IND/08	D	6
Integrated systems of management of safety and hygiene in the workplace	ING-IND/35	D	6
Maintenance and simulation of industrial plants	ING-IND/17	D	6
Marine Engineering	ING-IND/02	D	9
Mechanical, thermal and testing measurements	ING-IND/08	D	6
Metallurgy and corrosion with laboratory	ING-IND/22	D	9
Mobile robots (in English)	ING-IND/13	D	6
Multidisciplinary analysis, design and optimization of complex systems	ING-IND/08	D	3
Naval Architecture and Ship Technology Laboratory	ING-IND/01	D	6
Production planning and control (*)	ING-IND/16	D	6
Renewable energy technologies (in English)	ING-IND/09	D	6
Solid modeling	ING-IND/15	D	3

(*) Only if the course has been activated.

PREREQUISITES

The prerequisites indicated in the following table are recommended:

Course	Precedence
Mechanical plants	Fundamentals of thermo-fluid dynamics for machinery; Machine design
Machinery project	Fundamentals of thermo-fluid dynamics for machinery; Machine design
Fundamentals and methods for design	Fundamentals of thermo-fluid dynamics for machinery; Machine design; Integrated CAD/CAE mechanical design
Robotics	Vibration mechanics; Machine design
Mechanical design with advanced materials and additive manufacturing	Machine design; Integrated CAD/CAE mechanical design
Integrated systems of management of safety and hygiene in the workplace	Health and safety at the workplace
Multidisciplinary analysis, design and optimization of complex systems	Fundamentals and methods for design

ENERGY AND SUSTAINABILITY Curriculum				
1st year (54 CFU)				
Course	*Modules*	*Sector*	*TAF*	*CFU*
Machine design		ING-IND/14	B	9
Fundamentals of thermo-fluid dynamics for machinery		ING-IND/08	C	9
Vibration mechanics		ING-IND/13	B	9
Computational Fluid Dynamics and Heat Transfer (in English)	Introduction to Computational Fluid Dynamics	ING-IND/10	B	3
	Computational Methods for Fluid Dynamics and Heat Transfer	ING-IND/10	B	6
Buildings HVAC Systems (in English)		ING-IND/11	C	6
Mechanical, thermal and testing measurements		ING-IND/08	C	6
Elective educational activities chosen by the student			D	6
2nd year (66 CFU)				
Course	*Modules*	*Sector*	*TAF*	*CFU*
Fundamentals and methods for design		ING-IND/08	B	9
Mechanical plants		ING-IND/17	B	9
Machinery project		ING-IND/08	B	9
Industrial energy management (in English)		ING-IND/08	B	6
Renewable energy technologies (in English)		ING-IND/09	B	6
Health and safety at the workplace		ING-IND/35	F	6
Elective educational activities chosen by the student			D	6
Internship			F	6
Final examination			E	12

In the Study Plan of the ENERGY AND SUSTAINABILITY curriculum there are some Elective educational activities chosen by the student (TAF D). The choice of these modules is free, but it must be coherent with the educational project. Coherence will be assessed case-by-case by the Board of Studies of Mechanical Engineering.

The approval will be automatic if the modules are chosen among those shown in the following table:

ELECTIVE COURSES of ENERGY AND SUSTAINABILITY Curriculum			
Course	Sector	TAF	CFU
Economic evaluation of plans and projects	ING-IND/17	D	6
Elements of Fluid machinery and Energy Systems (in English)	ING-IND/09	D	6
Emission abatement systems	ING-IND/17	D	6
Hydrogen and fuel cells (in English)	ING-IND/08	D	6
Integrated CAD/CAE mechanical design	ING-IND/15	D	6
Integrated systems of management of safety and hygiene in the workplace	ING-IND/35	D	6
Maintenance and simulation of industrial plants	ING-IND/17	D	6
Marine Engineering	ING-IND/02	D	9
Mechanical design with advanced materials and additive manufacturing	ING-IND/14	D	6
Metallurgy and corrosion with laboratory	ING-IND/22	D	9
Mobile robots (in English)	ING-IND/13	D	6
Multidisciplinary analysis, design and optimization of complex systems	ING-IND/08	D	3
Naval Architecture and Ship Technology Laboratory	ING-IND/01	D	6
Fundamentals of electrical drives and systems	ING-IND/32	D	6
Production planning and control (*)	ING-IND/16	D	6
Robotics (in English)	ING-IND/13	D	6
Solid modeling	ING-IND/15	D	3

(*) Only if the course has been activated.

PREREQUISITES

The prerequisites indicated in the following table are recommended:

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Robotics	Vibration mechanics; Machine design
Mechanical design with advanced materials and additive manufacturing	Machine design; Integrated CAD/CAE mechanical design
Integrated systems of management of safety and hygiene in the workplace	Health and safety at the workplace
Multidisciplinary analysis, design and optimization of complex systems	Fundamentals and methods for design