



**MASTER COURSE IN MATERIALS ENGINEERING (LM 53) - A.A. 2023/2024**

**A2 Curriculum Energy, Environment and Sustainable Development**

FIRST YEAR											
FIRST SEMESTER											
Esse3 code	N°	Courses	SSD	CFU	B	C	D	E	F	Duration (hours)	Notes
146018	1	Metallic materials engineering	ING-IND/21	9	9					90	
146016	2a	Physics and thermodynamics of materials (Mod. 1 - Physics of materials)	FIS/03	6	6					60	
	2b	Physics and thermodynamics of materials (Mod. 2 - Thermodynamics of materials)	CHIM/07	6	6					60	
146019	3	Engineering properties of materials	ING-IND/22	9	9					90	
		<b>SAFETY COURSES</b>									(1)
				<i>Tot.</i>	30	30	0	0	0	0	
SECOND SEMESTER											
Esse3 code	N°	Courses	SSD	CFU	B	C	D	E	F	Duration (hours)	Notes
146020	4	Ceramic materials engineering	ING-IND/22	6	6					60	
146017	5a	Polymeric and composite materials engineering (Mod. 1 - Polymeric materials)	ING-IND/22	6	6					60	
	5b	Polymeric and composite materials engineering (Mod. 2 - Composite materials)	ING-IND/22	6	6					60	
146021	6	Corrosion and degradation control of materials	ING-IND/22	6	6					60	
		Other activities		3					3		(2)(3)
				<i>Tot.</i>	27	24	0	0	0	3	
				<b>Tot. 1st year</b>	<b>57</b>	<b>54</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	

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SECOND YEAR											
FIRST SEMESTER											
Esse3 code	N°	Courses	SSD	CFU	B	C	D	E	F	Duration (hours)	Notes
146022	7	Electrochemistry for energy and environment	ING-IND/23	6		6				60	
140429	9	Materials for energy	ING-IND/22	6		6				60	
145957	10	Mechanics and materials for engineering design	ING-IND/14	9		9				90	
146023	8	Nanomaterials, nanotechnologies and smart materials	ING-IND/22	6		6				60	
	12a	Elective course		6			6			60	(4)
				<i>Tot.</i>	33	0	27	6	0	0	
SECOND SEMESTER											
Esse3 code	N°	Courses	SSD	CFU	B	C	D	E	F	Duration (hours)	Notes
145486	11	Recycling and sustainable materials	ING-IND/22	6	6					60	
	12b	Elective course		6			6			60	(4)
145570		Final project		18				18			
				<i>Tot.</i>	30	6	0	6	18	0	
				<b>Tot. 2nd year</b>	<b>63</b>	<b>6</b>	<b>27</b>	<b>12</b>	<b>18</b>	<b>0</b>	

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<b>TOTAL CFU</b>	<b>120</b>	<b>60</b>	<b>27</b>	<b>12</b>	<b>18</b>	<b>3</b>
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ELECTIVE COURSES											
FIRST SEMESTER											
Esse3 code	N°	Courses	SSD	CFU	B	C	D	E	F	Duration (hours)	Notes
146094		Bioinks and 3D Printing	ING-IND/34	6			6			60	
146096		Interdisciplinary laboratory: Ceramic materials	ING-IND/22	3			3			30	(5)
146097		Interdisciplinary laboratory: Polymeric materials	ING-IND/22	3			3			30	(5)
146098		Interdisciplinary laboratory: Advanced metals	ING-IND/21	3			3			30	(5)
146099		Interdisciplinary laboratory: Characterization techniques	CHIM/07	3			3			30	(5)
145532		Powder metallurgy	ING-IND/21	6			6			60	
145783		Advanced Formula SAE	ING-IND/12	6			6				offered by LM 33
SECOND SEMESTER											
Esse3 code	N°	Courses	SSD	CFU	B	C	D	E	F	Duration (hours)	Notes
145572		Circular economy for materials processing	ING-IND/21	6			6			60	
140427		Glass engineering	ING-IND/22	6			6			60	
146197		Microelectronics devices, sensors and MEMS	ING-INF/01	6			6			60	offered by LM 33
146095		Optoelectronics and quantum devices for sensing and automation	FIS/01	6			6			60	offered by LM 33
145524		Protection of materials and structures	ING-IND/22	6			6			60	

PROFESSOR
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Dirè Sandra
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#### NOTES:

- (1) = All students must have the certifications of:
  - the **general training course "Sicurezza formazione generale"**, or similar course;
  - the **specific training course - medium risk "Sicurezza in laboratorio- UniTrento"**, or similar course;
  - For any further information about safety training, please visit the website: <https://infostudenti.unitn.it/en/safety-training-for-students>
- (2) = The curriculum is considered complete with a total of 3CFU - type F. The credits have to be obtained during the master with the following regulation: <https://www.dii.unitn.it/en/121/other-activities-type-f-credits>.
- (3) = **International students** are required to demonstrate an adequate level of competence of the Italian Language (Level A1 CEFR – 3 ECTS/CFU – type F) before starting the exam session of the second year.
- (4) = Different elective modules - not included in the Manifesto - have to be approved by the Teaching board of the Department.
- (5) = The student must choose **two of the four course modules** to achieve the 6 credits. The choice of a single module is not allowed.

**Approved on 15/02/2023 by the Department's Board**