



MASTER'S DEGREE PROGRAMME IN MATERIALS ENGINEERING

Study programme for students enrolled in the academic year 2024-2025

CURRICULUM IN FUNCTIONAL MATERIALS

(This curriculum is divided into two tracks)

1st YEAR

MANDATORY UNITS

CREDITS

SOLID STATE PHYSICS

9

SCIENCE AND TECHNOLOGY OF CERAMICS

9

TECHNOLOGY OF METALS

9

COMPOSITE MATERIALS

9

POLYMER PROCESSING AND RECYCLING

6

MATERIALS STRUCTURAL INTEGRITY

9

2nd YEAR

MANDATORY UNITS

CREDITS

MATERIALS SELECTION AND DESIGN

6

Select one of these tracks:

TRACK 1: NANO/BIO MATERIALS

MANDATORY UNITS

CREDITS

NANOSTRUCTURED MATERIALS

9

FUNDAMENTALS OF NANOSCIENCE

6

BIOPOLYMERS ENGINEERING

6

INORGANIC BIOMATERIALS

6

TRACK 2: MATERIALS FOR ENERGY

MANDATORY UNITS

CREDITS

RENEWABLE ENERGY TECHNOLOGIES

9

PHOTOVOLTAIC SCIENCE AND TECHNOLOGY

6

SUSTAINABLE ENERGY: MATERIALS AND TECHNOLOGIES

6

MANUFACTURING TECHNOLOGY	6
FREE-CHOICE UNITS AMONG THE FOLLOWING ACTIVITIES (12 credits, including units from other curricula or tracks)	
UNITS	CREDITS
INTRODUCTION TO THE FINITE ELEMENT METHOD	6
NANOFABRICATION	6
NANOSTRUCTURED MATERIALS (only for those who have not taken the activity of 9 credits)	6
BUSINESS MANAGEMENT	6
ELECTROCHEMICAL ENERGY STORAGE TECHNOLOGIES	6
PROCESS TECHNOLOGIES FOR CARBON-NEUTRAL FUELS	6
MEMBRANE SEPARATION PROCESSES	6
PARTICLE TECHNOLOGY FOR THE FOOD AND PHARMACEUTICAL INDUSTRIES	6
ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS)	3
MASTER'S THESIS	21
Final Notes: The Master's degree programme offers three curricula divided into distinct tracks (except for Advanced Materials Technologies). There are no propaedeutic units to attend the second-year activities. Although not mandatory, classroom attendance is strongly recommended. Students are required to submit their study plan through the UNIWEB platform as early as the first enrolment year. This document was prepared in Spring 2024. Therefore, it is strongly recommended to check, at the beginning of each academic year, the correct placement of the course units in the semesters and the activation of the free-choice activities.	

MASTER'S DEGREE PROGRAMME IN MATERIALS ENGINEERING

Study programme for students enrolled in the academic year 2024-2025

CURRICULUM IN ADVANCED MATERIALS TECHNOLOGIES

1st YEAR

MANDATORY UNITS

CREDITS

SOLID STATE PHYSICS

9

SCIENCE AND TECHNOLOGY OF CERAMICS

9

TECHNOLOGY OF METALS

9

COMPOSITE MATERIALS

9

ELECTRICAL AND ELECTROMAGNETIC MICRO/NANODEVICES

6

MATERIALS STRUCTURAL INTEGRITY

9

GLASS SCIENCE TECHNOLOGY

6

IRONMAKING AND STEELMAKING

9

2nd YEAR

MANDATORY UNITS

CREDITS

DESIGNING WITH POLYMERS

6

MANUFACTURING TECHNOLOGY

6

MATERIALS SELECTION AND DESIGN

6

**FREE-CHOICE UNITS AMONG THE FOLLOWING ACTIVITIES (12 credits,
including units from other curricula)**

UNITS

CREDITS

INTRODUCTION TO THE FINITE ELEMENT METHOD

6

NANOFABRICATION

6

NANOSTRUCTURED MATERIALS

6

BUSINESS MANAGEMENT

6

ELECTROCHEMICAL ENERGY STORAGE TECHNOLOGIES

6

PROCESS TECHNOLOGIES FOR CARBON-NEUTRAL FUELS

6

MEMBRANE SEPARATION PROCESSES

6

PARTICLE TECHNOLOGY FOR THE FOOD AND PHARMACEUTICAL
INDUSTRIES

6

ENGLISH LANGUAGE B2 (PRODUCTIVE SKILLS)	3
MASTER'S THESIS	21
<p>Final Notes:</p> <p>The Master's degree programme offers three curricula divided into distinct tracks (except for Advanced Materials Technologies).</p> <p>There are no propaedeutic units to attend the second-year activities. Although not mandatory, classroom attendance is strongly recommended.</p> <p>Students are required to submit their study plan through the UNIWEB platform as early as the first enrolment year.</p> <p>This document was prepared in Spring 2024. Therefore, it is strongly recommended to check, at the beginning of each academic year, the correct placement of the course units in the semesters and the activation of the free-choice activities.</p>	

MASTER'S DEGREE PROGRAMME IN MATERIALS ENGINEERING

Study programme for students enrolled in the academic year 2024-2025

CURRICULUM AMASE*

*This curriculum is reserved to those students selected through the international procedure as reported on AMASE Advanced Materials Science and Engineering - international Master in Materials Science website <https://www.eusmat.net/international-studies/master/amase/>. This curriculum offers five tracks.

1st YEAR	
MANDATORY UNITS	CREDITS
SOLID STATE PHYSICS	9
SCIENCE AND TECHNOLOGY OF CERAMICS	9
TECHNOLOGY OF METALS	9
<u>Select one of these tracks</u>	
TRACK 1: ADVANCED METALLIC MATERIALS	
MANDATORY UNITS	CREDITS
IRONMAKING AND STEELMAKING	9
CORROSION AND PROTECTION OF MATERIALS	6
MANUFACTURING TECHNOLOGY	6
MATERIALS STRUCTURAL INTEGRITY	9
ELECTROHEAT SCIENCE FOR MATERIALS TECHNOLOGIES AND CHEMICAL PROCESSES	6
QUALITY AND METROLOGY IN MANUFACTURING	6
TRACK 2: POLYMER AND COMPOSITES	
MANDATORY UNITS	CREDITS
COMPOSITE MATERIALS	9
POLYMER PROCESSING AND RECYCLING	6
COMPUTATIONAL MATERIALS SCIENCE	6
MATERIALS STRUCTURAL INTEGRITY	9
BIOPOLYMERS ENGINEERING	6
DESIGNING WITH POLYMERS	6
TRACK 3: SMART SURFACES AND FUNCTIONAL MATERIALS	
MANDATORY UNITS	CREDITS
COMPUTATIONAL MATERIALS SCIENCE	6

GLASS SCIENCE AND TECHNOLOGY	6
CORROSION AND PROTECTION OF MATERIALS	6
BIOPOLYMERS ENGINEERING	6
NANOSTRUCTURED MATERIALS	6
PIEZOELECTRIC DEVICES	6
INORGANIC BIOMATERIALS	6
TRACK 4: ADVANCED PROCESSING TECHNOLOGIES	
MANDATORY UNITS	CREDITS
MANUFACTURING TECHNOLOGY	6
MATERIALS SELECTION AND DESIGN	6
MATERIALS STRUCTURAL INTEGRITY	9
POLYMER PROCESSING AND RECYCLING	6
COMPOSITE MATERIALS	9
ELECTROHEAT SCIENCE FOR MATERIALS TECHNOLOGIES AND CHEMICAL PROCESSES	6
TRACK 5: NANO- AND BIOMATERIALS	
MANDATORY UNITS	CREDITS
FUNDAMENTALS OF NANOSCIENCE	6
BIOPOLYMERS ENGINEERING	6
COMPUTATIONAL MATERIALS SCIENCE	6
GLASS SCIENCE TECHNOLOGY	6
NANOSTRUCTURED MATERIALS	6
PIEZOELECTRIC DEVICES	6
INORGANIC BIOMATERIALS	6
FREE-CHOICE UNITS AMONG THE FOLLOWING ACTIVITIES (6 credits, including units from other curricula or tracks)	
UNITS	CREDITS
INTRODUCTION TO THE FINITE ELEMENT METHOD	6
NANOFABRICATION	6
BUSINESS MANAGEMENT	6
ELECTROCHEMICAL ENERGY STORAGE TECHNOLOGIES	6
PROCESS TECHNOLOGIES FOR CARBON-NEUTRAL FUELS	6

MEMBRANE SEPARATION PROCESSES	6
PARTICLE TECHNOLOGY FOR THE FOOD AND PHARMACEUTICAL INDUSTRIES	6
OTHER ACTIVITIES	9
FOREIGN LANGUAGES	6
MASTER'S THESIS	30
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