



MASTER'S DEGREE IN MATERIALS SCIENCE

(Degree programme class: LM-53 - Scienza e Ingegneria dei Materiali)

STUDENT INFORMATION BOOKLET

(Manifesto degli Studi)

a.y. 2022/2023

<https://www.materials-science.unito.it/do/home.pl>

July 2022

MASTER'S DEGREE IN MATERIALS SCIENCE

What is Materials Science and what about it in Turin?

“Materials science teaches us what things are made of and why they behave as they do”. This field concerns the whole life of a material, from its synthesis to its first characterization and development. Throughout the courses, students will approach different classes of materials (metals, polymers, metal oxides, carbon-based, hybrid and composites) and will learn their properties in view of potential innovative technological applications.

At the University of Turin, the emphasis of the courses is on the main concepts related to materials synthesis, characterization, simulation, properties, and applications, both from a theoretical and practical point of view. During the courses, the students are encouraged to develop original ideas for creating new materials which satisfy the requirements of society and the world market (i.e. cheap, safe, recyclable, and with minimum impact on the environment). Particularly the courses will introduce students to the environmental and economic impact of materials production and manufacturing, highlighting the importance of materials lifecycle and sustainability in modern society

This Master degree aims to form a materials scientist. He/she should be at the same time a chemist and a physicist. Students will therefore learn the language of both chemistry and physics, as a materials scientist should act as a bridge between these two apparently different, but very close disciplines.

Half of our student intake usually comes from countries other than Italy therefore, enrolment at the Master Degree in Materials Science guarantees a constant multicultural exchange, an important added value in an increasingly globalized world. The Master concludes with an individual research project carried out during an internship period at an academic or external/industrial research laboratory and the elaboration and discussion of a final thesis.

At the end of the Master degree, a materials scientist will then know how to prepare a material starting from its building block, how to characterize it, and eventually how to model its properties, allowing the knowledge transfer to the engineer and technologist. If you are curious about the working life after the graduation of our former students, check the careers section.

Programme structure

The Master degree in Materials Science aims to provide a firm grounding in the chemical, physical and technological behaviour of a vast range of materials with emphasis on modern advances in the field.

The course delivers advanced and integrated theoretical and practical training across the following interdisciplinary areas: chemistry and physics of solids, materials production, manufacturing and testing, with special attention to the characterization and modelling of material structures and properties. All lectures and examinations for the Master's degree are conducted in English.

Theoretical lectures and practical laboratories will be done in lecture halls and laboratories of the departments involved in the course.

Admission requirements

The Master's degree in Material Science is a free access course.

1. Applicants for admission onto the Master's Degree in Materials Science **must be in possession of a Bachelor's Degree**, obtained in Italy or abroad, **in one of the following subjects: Materials Science, Chemistry, Physics or Industrial Engineering**. In the case of foreign degree certificates, the degree must be recognized as equivalent to an Italian Bachelor's Degree according to Italian legislation.
2. Knowledge of English is strictly required, and applicants are also expected to have basic Information Technology (IT) skills (e.g. text elaboration, use of datasheets, etc.).
3. Applicants will be asked to attend an interview before their place on the Master's course can be confirmed. This is in order to verify that they possess the required level of knowledge.

Students who want to apply the Master's Degree in Material Science must be in possession of a Bachelor Degree, or an equivalent University degree of the duration of at least 3 years or another title obtained abroad, recognized as suitable.

To possess a Bachelor Degree in one of the following Categories: **Science and Chemical Technologies** (Classe 21 Scienze e Tecnologie Chimiche (D.M.509/99) L-27 Scienze e Tecnologie Chimiche (D.M. 270/04), **Science and Physical Technologies** (Classe 25 Scienze e Tecnologie Fisiche (D.M. 509/99), L-30 Scienze e Tecnologie Fisiche (D.M. 270/04), **Industrial Engineering** (Classe 10 Ingegneria Industriale (D.M. 509/99) L- 9 Ingegneria Industriale (D.M. 270/04).

For the students who obtained a Bachelor's Degree abroad, they will be accepted if the degree is considered similar to one of those listed above. Candidates who possess an academic title obtained abroad must apply through the procedure of the *Athenaeumopen_in_new*.

For the enrolment to the Master's Degree and to the interview there is an **Evaluation Test** to which **all** the applicants have to apply, either those who already have a Bachelor Degree or those who are close to obtain it. The enrolment to the Test is considered as a reservation to the interview.

The enrolment to the Evaluation Test **will be opened on the 4th July 2022 at 9.30 am until 2nd December 2022 at 11:00 pm**.

The candidate will have to access to MyUnito and under the window "Enrolments" he will find the section "Evaluation test". Here the candidate will have to indicate to which interview he/she wants to participate. Those who are already students of the university of Turin are already registered, all the others first have to register on the Unito portal. In the case the candidate does not possess a Bachelor's Degree yet, he/she has to upload a self-certification of the Degree with all the exams and the enrolment to the missing exams.

The dates for the interview on-line are the following:

September 13, 2022 at 9:30 am

September 26, 2022 at 9:30 am

October 20, 2022 at 2:00 pm

December 12, 2022 at 2:00 pm

Students from the Bachelor degree in "Scienza e tecnologia dei materiali" obtained at the university of Turin are exempted from the oral interview. However, they have to enroll to the evaluation test before the deadline.

Once the admission test is passed, the candidate will need to proceed with the enrollment through the online procedure on the website www.unito.it/open_in_new, respecting all the administrative deadlines :

The Enrolment procedure to this master degree will be open **is available on the [unito.it website](http://unito.it).**

The success full Enrollment to the Master's Degree depends on a positive result at the interview. To ask **a support and/or extra timing** according to the Law 104/92 and to know which certifications to provide

Observe the Service of the Atheneum for [Students with special needs](#)

and organize a meeting with the Office Students with Handicap and SLD in order to

- plan at the best your introduction to the University (in the months of June-July)
- verify your certifications

obtain necessary information on the procedure and the timing for the pre-enrollment and on the instruments and supports you have the right to take advantage of.

Contacts: ufficio.disabili@unito.it

Prerequisites, attendance obligations

There are no mandatory prerequisites. Attendance to lessons is not compulsory. Attendance to laboratory courses is compulsory and cannot be less than 70% of the scheduled hours.

Exams sessions

The time window of each year during which the exams take place are indicated at the page of the academic calendar open_in_new.

The available sessions are listed on the "[bacheca appelli open_in_new](#)".

To register at an exam: connect to the Unito portal and access to MyUnito with your username and password. After the access, select from the menu the section "Exams" and then "Available Exams Sessions".

Important warning: Before to register to an exam check that

1. you have successfully completed the enrollment and the payment of the tuition fees
2. your study plan is confirmed and "APPROVED"
3. you have filled the online questionnaire for the didactics evaluation

Remember to come to all the exams (oral and written) with a valid ID document.

All the information about how to register to an exam can be found at this step-by-step guide.

Exam session: January-February-June-July-September

Thesis preparation and defense

The final examination requires writing an original dissertation to be presented and discussed in front of an *ad-hoc* Graduation Committee, composed by at least seven members of the staff. The Thesis is elaborated by the student (under the supervision of a professor) on a topic agreed with the supervisor. The manuscript has to be written in English.

Marking criteria, the final exam

After receiving a feedback from the supervisor, co-examiner and commission members, the exam commission will award marks for the final exam using a scale of 0-7. The breakdown of the final exam score will be as follows:

- a. Thesis supervisor's score: 0-2.5
- b. Co-examiner's score: 0-2.5
- c. Exam commission's score (excluding supervisor and co-examiner if they also form part of the commission): 0-2

Evaluation by the supervisor and co-examiner will be based on the candidate's written manuscript and oral presentation including the ensuing discussion.

Evaluation by the exam commission will be based on the thesis summary, the candidate's oral presentation and the ensuing discussion.

Overall evaluation of degree

The final overall mark for the degree will be given out of a maximum of 110 points, and will reflect the candidate's performance throughout the degree's two-year programme of study.

The following additional honors may be awarded to candidates with high scores.

- 110 cum summa laude. This is possible when the various degree modules and thesis discussion have been evaluated to produce a final grade equal to or greater than 112 points
- 110 cum summa laude and special mention ("Menzione") for candidates with scores of 109/110 (excluding the score for the final exam thesis) and provided there is unanimous agreement of the exam commission.

- 110 cum laude and an official recommendation for the thesis to be published (Dignità di Stampa). Recommendation for the thesis to be published must be requested by the candidate's supervisor and the commission must be in unanimous agreement that the thesis demonstrates scientific research of the highest standard.

Study plan

The study plan is the complete set of exams that you need to sit in order to graduate. Each degree programme envisages a certain number of learning activities (course units, laboratories, other activities): some are compulsory, others are elective. The sum of the compulsory and elective activities represents your study plan

Academic year 2022/23

Compile or change the study plan. The deadline to choose or change the type of commitment (full time/part time) is **from October 2022 to January 2023**.

Academic Calendar

Courses are divided over 2 semesters:

I semester: 03/10/22 -03/02/23

II semester: 06/03/23-09/06/23

The breaks between semesters are available to the student for the acquisition of credits.

The schedule of the lessons is published on the website of the Degree Program. The starting dates of the individual courses are intended as scheduled, unless otherwise announced on the site.

Tutoring and buddy

Buddy Project provides international students, upon request, with a person who:

- supports you on the most urgent issues on your arrival at Torino (housing, University, UniTO website, administrative procedures)
- comes with you to the University offices to help you carrying out administrative procedures
- shows you the main University facilities and buildings (offices, rooms, administration, restaurants, libraries, teachers' rooms).

Concerning the **Tutoring** activities, meetings between students and professors/coordinators are organized periodically during the academic year:

- Last week of September before the lectures beginning. All the professors meet the students of the first year for presenting their courses

- During the first semester, a meeting between professors and 2nd-year students is foreseen in order to present the Thesis topics available in the current academic year.

((^Digital facilitator))

The digital facilitator is a new position created last year from the University to deal with the problems of distance learning and more. The main tasks include:

- **Social and sites**, improve the communication channels so that all students can be always update and easily find information about study programme;
- **Teaching material**, collect any reports about problems linked with distance learning (missing material, delay in publishing, etc.) and communicate with professors in order to solve the issues in the fastest way;
- **Co-working**, encourage the virtual exchange of information as often happens during the University life inside and outside the department;
- **News**, spreading the news promoted by the Department of Chemistry. You can reach me also to have more information about the study programme (stage, thesis, study plan, etc).

Study program

MATERIALS SCIENCE

First Year

Course	Type	Type	Course disciplinary sector	Credits	Semester
QUANTUM EFFECTS IN MATERIALS: FROM THEORY TO MODELLING	C	Attività formative affini o integrative	FIS/02 CHIM/02	10	I
SYNTHETIC CHEMISTRY FOR SMART APPLICATIONS	B/C	Discipline chimiche e fisiche/ Attività formative affini o integrative	CHIM/06 CHIM/04	10	I
SOLID STATE CHEMISTRY: FROM THE MACRO TO THE NANO	B/C	Discipline chimiche e fisiche/ Attività formative affini o integrative	CHIM/03 CHIM/01	10	I
SURFACE PHENOMENA AT THE MICRO AND NANO SCALE	B	Discipline chimiche e fisiche	CHIM/02	8	II
STRUCTURE CHARACTERIZATION AND MODELING	B/C	Discipline chimiche e fisiche/ Attività formative affini o integrative	CHIM/02 GEO/06	8	II
SOLID STATE PHYSICS: OPTO-ELECTRICAL PROPERTIES, MICROFABRICATION AND DEVICES	B	Discipline fisiche e chimiche	FIS/03	8	II
METALS FOR SUSTAINABLE MANUFACTURING	B	Discipline dell'ingegneria	ING/22	6	II
Totale Crediti				60	

Second Year

Course	Type	Type	Course disciplinary sector	Credits	Semester
ENVIRONMENTAL, MEDICAL AND TECHNOLOGICAL APPLICATIONS OF MINERALS AND MINERAL-LIKE MATERIALS	B	Discipline chimiche e fisiche	GEO/06	6	I
SUSTAINABLE POLYMERS AND COMPOSITE	B	Discipline chimiche e fisiche	CHIM/04	8	I
COMPUTATIONAL METHODS FOR THE USE OF MATERIALS	B	Discipline dell'ingegneria	ING/22	8	I
OPTIONAL COURSES	D			8	I-II
INTERNSHIP LABORATORY	F	Tirocini Formativi e di Orientamento		15	II
THESIS	E	Per la Prova Finale		15	II
Totale Crediti				60	

Optional courses (8 ects)

The Study Plan includes 8 CFUs chosen by the student, these credits can be chosen among the Optional Courses activated at the Course of Studies in Materials Science and among the other courses available at the University of Turin, which include a final grade.

The optional courses activated by the Master's Degree Course in Materials Science for the academic year 2022/2023 are as follows:

- *ADVANCED DIFFRACTION METHODS FOR APPLICATIONS*
- *X-RAY SPECTROSCOPY FOR THE CHARACTERIZATION OF MOLECULES AND MATERIALS*
- *MAGNETIC ATOMS AND MOLECULES IN MATERIAL SCIENCE, CHEMISTRY AND BIOCHEMISTRY*
- *IN-SILICO PREDICTION OF MATERIALS PROPERTIES*
- *MACHINE LEARNING AND ITS APPLICATIONS OF MINERALS AND MINERAL-LIKE MATERIALS*
- *MATERIALS FOR ENERGY: SUPERCONDUCTORS, H₂ STORAGE AND BATTERIES*
- *ANALYTICAL CHEMISTRY FOR MATERIALS SCIENCE AND MATERIALS FOR ANALYTICAL CHEMISTRY*

In the frame of the free credits available in our Course it will be possible for international Materials Science students (1st year) to select also

- *ITALIAN FOR INTERNATIONAL STUDENTS BEGINNER LEVEL*
- *ITALIAN FOR INTERNATIONAL STUDENTS PRE-INTERMEDIATE LEVEL*

These courses will be available in the second semester.

Each course will cover 3 CFU

If the student wants to carry out an internship in addition to that foreseen for the thesis laboratory (thesis activity is not part of the internship), he must submit an application to the student practices commission before inserting this in the career plan at the place of optional courses.

To activate the internship, the student must follow the procedure provided for internships, have the approval of an academic tutor and carry out the activity at an external body (industrial laboratory or research centre).

The internship will only be considered additional to the curricular ones.

Programs

The detailed programs of the courses are available on the "Courses" page of the degree course website:

<https://www.materials-science.unito.it/do/home.pl/View?doc=courses.html>