



UNIVERSITÀ DEGLI STUDI DI NAPOLI FEDERICO II
SCHOOL “POLITECNICA E LE SCIENZE DI BASE”

DEPARTMENT OF CHEMICAL SCIENCE

Student's Guide 2023-24



2nd Cycle Degree/Master

Molecular and Industrial Biotechnology

Degree programme class: LM-8

Corso di Laurea Magistrale
BIOTECNOLOGIE MOLECOLARI E INDUSTRIALI



Biotechnologie Industriali Federico II



BiotechnologieindustrialiFII



Biotechnologie Biomolecolari e Industriali UNINA

A quick guide to the programme

The programme at a glance

The MSc programme aims to educate graduated students for high profile positions in research centres, enterprises and industries operating in industrial biotechnology field.

The programme includes activities aimed at acquiring:

- (a) knowledge on the structure and function of biological systems, interpreted according to molecular and informational logics, from the cellular level to that of the organisms;
- (b) fundamental knowledge and techniques in various fields of industrial biotechnology, with particular attention to multidisciplinary approaches;
- (c) specialist skills in specific sectors of industrial biotechnology.

The MSc provides the opportunity of external activities (e.g. internships in companies, public or private research institutes, traineeships in Italian and European universities) to strengthen skills in specific sectors of industrial biotechnology.

The MSc programme includes - as a qualifying moment of the training - an experimental thesis carried out in academic research laboratories and/or in other public/private structures, including the results of an original scientific and technological research.

The programme includes two curricula:

“BiRRe - Biotechnology for Renewable Resources” – The curriculum is focused on molecular and industrial issues of biotechnology to prepare students to the construction of new products and services based on the exploitation of renewable resources. Lectures for 48 CFU are hold in English language. 30 CFU lectures are hold in Italian language.

“ProBio - Biotechnology productions” – The curriculum is focused on molecular and industrial aspects of biotechnology to educate students to a general integrated approach to consolidated and emerging technologies. Lectures are hold in Italian language.

Job opportunities

Potential fields of activity of MSc graduated students are biotechnological enterprises, chemical, pharmaceutical/cosmetic and nutraceutical industries, as well as the environmental technology sector.

The MSc graduated students will be able to operate covering positions of high responsibility, including technical, economic and legal implications.

The overview by AlmaLaurea reports that graduated students found positions within 4 months from the graduation ceremony. A large fraction (80%) of the interviewed graduated students works for chemical/energy enterprises. A large fraction (85%) of the interviewed graduated students works for private enterprises.

It is possible to check the positions of the graduated students by clicking at the LinkedIn link reported in the “Albo” of the graduated students at page <http://www.bioteconologieindustriali.unina.it/en/yearbook/>

Admission to the programme and prerequisites

The enrolment to the Master's Degree course requires that the students:

- a) is BSc graduated
- b) has sufficient knowledge in the disciplines listed below:
 - mathematical, chemical and physical disciplines;
 - biological disciplines (biochemistry, molecular biology, genetics);
 - disciplines of the fermentation sector (microbiology and chemistry of fermentation);

- disciplines of process technologies (thermodynamics and transport phenomena, foundations of unitary operations for biotechnologies).

c) CFU in SSDs as reported:

30 CFU in Biological Sciences area (BIO / 01-BIO / 19)

6 CFU in Mathematical and Computer Sciences area (MAT / 01-MAT / 09)

6 CFU in Physical Sciences area (FIS / 01-FIS / 08)

18 CFU in Chemical Sciences area (CHIM / 01-CHIM / 12)

Language skills: documented competence in the correct use of the English language comparable to level B2.

Details on the page

http://www.biotechnologieindustriali.unina.it/media/pages/1/19/attach/Regolamento_accesso_LM.pdf

Study plan

Curriculum: Biotechnology for Renewable Resources (BiRRe)

(the IT marks the courses held in Italian language. Italics character marks the course specific of the curriculum)

I year

Industrial microbiology and fermentation chemistry (IT)- 6 CFU

Microalgal exploitation - 12 CFU

Industrial biotechnologies and environment protection (IT)- 12 CFU

Transport Phenomena for Biotechnological Applications - 9 CFU

Biopolymers and Bioplastics - 12 CFU

Biorefinery processes - 6 CFU

II year

Hygiene background for biotechnologies (IT)- 6 CFU

Design of conversion processes - 12 CFU

Biosensors and Biochips (IT) - 6 CFU

Environmental economics - 6 CFU

Free selection proposed by the student - 12 CFU

Practical training - 18 CFU

At closure of the graduation carrier requires the attending of the Final Exam (3 cfu). The discussion of the graduation thesis is mandatory.

Curriculum: Produzioni Biotecnologiche (ProBio)

(the IT marks the courses held in Italian language. Italics character marks the course specific of the curriculum)

I year

Industrial microbiology and fermentation chemistry (IT)- 6 CFU

System biology and bioinformatics (IT) - 12 CFU

Industrial biotechnologies and environment protection (IT)- 12 CFU

Transport phenomena in biological systems (IT) - 9 CFU

Biochemistry biotechnology (IT) - 12 CFU

Bioreactors (IT) - 6 CFU

II year

Hygiene background for biotechnologies (IT)- 6 CFU

Biotechnological processes (IT) - 12 CFU

Biosensors and Biochips (IT) - 6 CFU

Bioeconomics and intellectual property (IT) - 6 CFU

Free selection proposed by the student - 12 CFU

Practical training - 18 CFU

At closure of the graduation carrier requires the attending of the Final Exam (3 cfu). The discussion of the graduation thesis is mandatory.

Free selection proposed by the student: set of courses proposed.

BIO SOFT matter: microstructured fluids in biotechnologies (IT) - 6 CFU

Tissue engineering (IT) - 6 CFU

Additional study plan information

Students must submit a Study Plan (PdS) at the enrolment to select the curriculum.

Customizing the study plan

Students have to submit a PdS to select the free selection of courses (18 CFU). Students that moves abroad for ERASMUS programme must present a PdS for the selection of courses to be followed at the final University.

Traineeship opportunities

The student must carry out internship activities at the University or at non-university structures. No-university structures must be recognized and accredited by the University and operating in the scientific sector of interest (the list of accredited structures is available on the University website).

Graduation thesis and exam

The **Master's Degree Final Exam** consists in the presentation and discussion of a written dissertation (**Master's Degree Thesis**) which deals with an experimental **subject congruent with the field of Industrial Biotechnologies**. The **thesis** consists of a written test in which are presented the premises, the development and the conclusions of an experimental work, from which the contribution of the candidate has to be evident in the various phases of the project. Short instructions for writing the thesis can be downloaded from the web site. Students are encouraged to write the thesis in English, also to favor its diffusion in the international working world. In the case of a thesis written in English, it is mandatory to insert a summary of two pages written in Italian. The Graduating student has 15 minutes for the oral presentation of the thesis project.

International exchange programmes (Erasmus programme)

ERASMUS+ Programme allows students to spend a period in a foreign European university through UE funding. During their stay, the students can follow courses, give exams and use the infrastructures of the host university just as regular students. The activity to be performed at the host university must be planned together with the own institutional organization.

The students are invited to contact the tutors of the proposals before submitting the application in order to: 1) know the activities offered by the host universities; 2) define a possible activity program at the host organization.

Orientation and Tutoring

Orientation to incoming students

Every year, incoming orientation activities are carried out for graduate and undergraduate students through a series of initiatives widely advertised on the website and on social channels.

Every year at the Monte S. Angelo, events for the presentation of the Master's Degrees are organized open to graduate and undergraduate students of the Federico II University and outside the University.

The professors of the Industrial Biotechnology Degree Courses welcome requests for clarification of the objectives of the Master's Degree.

Tutoring and counseling

A series of activities are organized aimed at orientation in-itinere. They include:

- TUTORING - the students of each year of the course are divided into groups and can contact the assigned professor.
- OBSERVATORY progression 1st year Master's Degree. The careers of students in the first year of the Degree are checked every six months: April and November of each year. The analysis is aimed at supporting students in the progression of their university career. While respecting anonymity, the results are discussed in the MSc Committee meetings and shared with the student representatives in the Working Table.

Career orientation and job placement

Outgoing orientation and placement initiatives are organized in close coordination with the other degree programs of the Department / School / University. Every year, the Polytechnic and Basic Sciences School organizes the Career Day with meetings with companies.

Career orientation meetings are organized as an integral part of the training activities.

Calendar of educational activities and timeline

Application timeline

Initial enrolment is presented from July 17, while successive enrolment is from September 1st. The initial enrolment is possible until March 31st. Details are reported on the website of the University:

<https://www.unina.it/didattica/sportello-studenti/guide-dello-studente>

Further deadlines (presentation of study plan, ERASMUS application, , etc.) are reported on the website of the MSc.

Academic Calendar: courses and exams

I Semester – From the end of September up to the beginning of Christmas holiday

II Semester – From the beginning of March up to the beginning of June

Exams – January to March. June, July, September and October, with a special session on April and November

Course Timetable

The timetable of the lectures is available at the webpage

<http://www.biotecnologieindustriali.unina.it/en/page/laurea-magistrale/orari-delle-lezioni-laurea-magistrale.html>

Graduation dates

The timetable of the graduation exams is available at the webpage

<http://www.biotecnologieindustriali.unina.it/it/page/didattica-ed-orientamento/esami-di-laurea-e-laurea-magistrale.html>

Contact persons

Chairman of the MSc: Prof.ssa Daria Maria Monti – Dipartimento di Scienze Chimiche - tel. 081.679150 - e-mail: dariamaria.monti@unina.it.

Responsible for the Orientation: Prof.ssa Angela Arciello, Dipartimento di Scienze Chimiche - Tel. 081-679147. e-mail: angela.arciello@unina.it

Responsible for the SOCRATES/ERASMUS programme: Prof.ssa M. Luisa Tutino – Dipartimento di Scienze Chimiche - tel. 081.674317 - e-mail: tutino@unina.it.

Responsible for trainings: Prof.ssa Rachele Istico – Dipartimento di Biologia (tel. 081-679035 - email rachele.istico@unina.it) - e Dott. Daniele Tammaro – Dipartimento di Ingegneria Chimica, dei Materiali e della Produzione Industriale (e-mail: daniele.tammaro@unina.it).

Segreteria didattica:

Dott. Anna Mancino anna.mancino@unina.it, Dipartimento di Scienze Chimiche

Dott. Giuseppe Rollino giuseppe.rollino@unina.it, Segreteria Studenti area Scienze della Scuola Politecnica e delle Scienze di Base

Sent cc email to ccd.bioteconologieindustriali@unina.it

Comitato di Indirizzo del MSc

Dr. **Joanna Dupont-Inglis** (Head of EU Affairs, European Bioplastics)

Dott. **Leonardo Vingiani** (Direttore di Assobiotec, IT)

Dott. **Nicola Torre** (Centrient Pharmaceuticals, Delft, NL)

Working table

The Chairman of the MSc.

Two students for each year of the MSc.

Details at page

<http://www.bioteconologieindustriali.unina.it/it/page/la-struttura/tavolo-di-lavoro.html>

Sites and links

Site

Complesso Universitario di Monte Sant'Angelo

<https://www.google.com/maps/place/Universit%C3%A0+Degli+Studi+di+Napoli+Federico+II+Complesso+Universitario+di+Monte+Sant'Angelo/@40.8322726,14.1824662,15z/data=!4m19!1m13!4m12!1m4!2m2!1d14.1947658!2d40.8250146!4e1!1m6!1m2!1s0x133b0ed5dc19a33b:0xb3482663d2c21f6e!2smonte+sant'angelo+napoli!2m2!1d14.1849805!2d40.8388234!3m4!1s0x133b0ed5dc19a33b:0xb3482663d2c21f6e!8m2!3d40.8388234!4d14.1849805>

MSc:

<http://www.biotechnologieindustriali.unina.it/>

Department

<http://www.scienzechimiche.unina.it/home>

School website

<http://www.scuolapsb.unina.it/>

University website

<http://www.unina.it/home>

Social networks

Instagram

Biotechnologie IndustrialiFII

<https://www.instagram.com/biotechnologieindustrialifii/?hl=it>

Facebook

<https://www.facebook.com/biotechnologieindustriali/>

Telegram

<https://t.me/biotechnologieindustriali>

Twitter

BiotechnologieindustrialiFII

<https://twitter.com/Biotechnologiei1>

Linkedin

Biotechnologie Industriali - Università degli Studi di Napoli "Federico II"

<https://www.linkedin.com/groups/6620663/>

YouTube

Biotechnologie Biomolecolari e Industriali UNINA

<https://www.youtube.com/channel/UCDUlubUpRIqZqeJ2xiVPp7Q>

Course description

The content and objectives of the courses, the name of the professor, the methods of carrying out the lectures and checking results can be consulted at the link

<http://www.biotecnologieindustriali.unina.it/it/page/didattica-ed-orientamento/laurea-magistrale.html>