UNIVERSITÀ
DEGLI STUDI
DI MILANO

Master's degree programme in

Biotechnology for the bioeconomy

facoltà di

SCIENZE AGRARIE E ALIMENTARI

Applications and admissions

Open, subject to entry requirements.

Admission requirements

- Students with an Italian University degree:
  - graduates of Laurea Triennale belonging to the L-2 class (Biotecnologia) and previous class 1 (Biotecnologia).
  - any student with a Bachelor's degree providing a strong background in biotechnology-related subjects, specifically at least 35 university credits (ECTS) in basic disciplines (mathematics, physics, chemistry, biology) and at least 25 ECTS in selected "core disciplines" for the L-2 class of Laurea Triennale, specified in the Master's programme description: Manifesto degli Studi
- Students with a degree from a non-Italian Institution:
  They must possess a Bachelor degree from an accredited college or University comprising exams in basic disciplines (mathematics, physics, chemistry, biology) and in all the following areas: molecular biology, genetics, microbiology, plant cell biology, biochemistry.

Proficiency in English at a B2 level or higher, is required for admission.
The B2-level requirement will be ascertained by the University Language Centre (SLAM) upon admission as follows:
- By a language certification at or above B2, obtained no more than 3 years earlier
- By the English level achieved during a Bachelor's degree programme through SLAM courses and tests. The certificates must be less than four years old
- Placement Test delivered by the University Language Centre (SLAM), which will take place according to the schedule posted to the website: www.unimi.it/en/node/39267/

Candidates who do not sit or pass the entrance test will have until 31 December 2025 to obtain and submit one of the recognized certifications to the SLAM.
Students who do not meet the requirement by 31 December will not be admitted to the Master's degree programme and cannot sit further tests.

The personal curriculum of the applicants and the certifications will be evaluated by an Admission Committee. No interview is foreseen.

Objectives

Bioeconomy responds to the environmental challenges the world is facing, oriented to reduce the dependence on natural resources, transform manufacturing, and promote sustainable production of renewable plants, microbial and animal resources for their conversion into food, feed, materials, bio-based products and bio-energy. Biotechnology is a key enabling technology to sustain a new green and sustainable economy (i.e. bioeconomy), offering solutions for an efficient and sustainable production of plant and microbial biomasses; production of bioenergy from (waste) biomasses; environmental protection and safety in terms of bioremediation; green chemistry processes and applications; sustainable agri-food production and processes; circular economy.

The BforB master's degree aims at providing students with advanced molecular and cellular background of microbial and plant systems, solid and broad expertise about the structure and function of biological macromolecules of interest for the bioeconomy sector. The master's degree will provide theoretical and practical instruments for the set-up, analyses and improvement of biotechnological processes for the transformation of renewable raw materials in biotechnological processes exploiting microorganisms, plants and enzymes, for plant and microbial-based bioremediation strategies, for bio-based approaches in food and agriculture sustainable development.

The BforB master's degree is international and entirely taught in English language, offering to the students a stimulant multicultural experience.

Career prospects

The BforB graduate is an expert in the coordination, management and set up of research and development laboratories in the chemical, agro-environmental and biotechnological sectors. The function will primarily be the development, implementation and coordination of laboratory activity within basic and applied research projects, set up of bioprocesses, the quality control. The BforB graduate is an expert in planning, development, analyses and control of processes for:

- Industrial fermentations for production of metabolites and renewable energy
- plant and microbial cell as biofactories for the production of molecules of interest in the fine chemical and polymer industry, agri-food and pharmaceutical industry with particular application to the green chemistry and bio-based industry
- bioremediation of contaminated land and waters, using plants and/or microorganisms
- innovative diagnosis tools, applied in particular to the traceability in agri-food chain

The employment opportunities for the BforB graduate are in research bodies (public and private) and bio-based chemical, pharmaceutical, agri-food, and biotechnological enterprises.

Degree syllabus

I year

COMPULSORY LEARNING ACTIVITIES	ECTS
I semester	
Biomass and waste recycling promoting the circular economy	7
Fermentation biotechnology	7
Methods in biotechnology	9
Structure and functions of biomolecules	8
II semester	
Environmental microbial biotechnology	6
Environmental plant biotechnology	6
Plants as biofactories	6
Protein engineering and proteomics	6

II year

(to be made available as of academic year 2026/2027)

COMPULSORY LEARNING ACTIVITIES	ECTS
Bioeconomy: management, assessment and intellectual property	6

Further elective courses

The student must choose two courses from the following list: - Bio-based innovation in the food industry - Biostatistics and design of experiments in biotechnology - Developing soft skills in science: case-studies from microbial biotechnology - Molecular analysis and traceability of biotechnological products - Applied biocatalysis - Functional foods and nutraceuticals	6+6
Free choice courses (suggested list, but not limited to): - Molecular biobased approaches for plant protection, 6 ects - Biomolecular experiment planning, 2 ects - Plant microbiome-based strategies for agri-environmental biotechnologies, 4 ects - Ree Crispres - A workshop on genome editing technologies, 3 ects	8
Other activities (laboratories, seminars)	3
Internship and final exam	36

INFO

Disciplinary classification: Agriculture biotechnologies (LM-7 R)

Duration: 2 years (120 ects)

Attendance: Strongly recommended

Location:
- via Celoria, 2 - Milano
- Altre strutture didattiche di Città Studi - Milano

Websites:
biotechnologybioeconomy.cdl.unimi.it/en
www.unimi.it

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Updated in May 2025.
For further information: www.unimi.it - Education