UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2025/26
MASTER DEGREE
SAFETY ASSESSMENT OF XENOBIOTICS AND BIOTECHNOLOGICAL PRODUCTS (Classe LM-9 R)
Enrolled in academic year 2025/26

HEADING

Degree classification - Denomination and code:	LM-9 R
Degree title:	Dottore Magistrale
Length of course:	2 years
Credits required for admission:	180
Total number of credits required to complete programme:	120
Years of course currently available:	1st
Access procedures:	Open, subject to entry requirements
Course code:	EBB

PERSONS/ROLES

Head of Study Programme

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Tutors - Faculty

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Degree Course website

https://safetyassessment.cdl.unimi.it
Email: didattica.disfeb@unimi.it

Via Celoria 18, Milano Phone 02 5032 5032 https://www.unimi.it/en/node/360 https://www.unimi.it/en/node/359
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CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

The aim of the Master Course is to present provision of training program in risk assessment based on common European and international criteria, easily adoptable by institutions across Europe and worldwide and focusing on Risk Assessment methodology and procedure.
The Master provides the methodological background, knowledge and skills necessary to apply current methodologies and generate novel protocols, to acquire competence in problem-solving, to assess risks arising from production and use of

chemicals and biotechnological products, with particular attention to the implementation of European Regulations through the integrated development of different areas including legislation, chemistry, toxicology and pharmacology, biotechnology and risk analysis. The graduates will have specific expertise in the areas of:
- community law, national and international legislation on chemicals, risk and safety;
- toxic and eco-toxic properties of chemicals and biotechnological products;
- methods and procedures for the characterization of chemical substances and biotechnological products;
- computational techniques for the estimation of the chemical and toxicological properties of substances;
- procedures for registration of chemicals under various European regulations;
- evaluation of risks inherent to the production and use of chemicals and biotechnological products;
- evaluation of new materials such as those produced by nanotechnologies and new processes;
- strategies of synthesis and production of alternatives to the toxic and/or eco-friendly;
- basis on risk perception and risk communication.

The project focuses on understanding the profile and training requirements of risk assessors in order to design a degree covering a range of disciplines in risk assessment and providing a model to establish a recognition of risk assessors. To this end, the Master degree in "Safety Assessment of Xenobiotics and Biotechnological Products" (SAXBi) has been certified (the first one in Europe), according to the Standard UNI EN 16736 and to the AICQ SICEV Regulation RG 06-1, that well define the formation for risk assessors.

The Master level "Safety assessment of xenobiotics and biotechnological products" (SAXBi) is equivalent to the second-level higher education award that refers to the second cycle in the Qualifications Framework of the European Higher Education Area (EHEA), designed by the Bologna Accords (1999) which refers to level 7 of the European Union's European Qualifications Framework. The degree requires 120 European Credit Transfer System (ECTS), and the expected learning outcomes will meet those specific to the second Dublin descriptor.

Expected learning outcomes

The Master course is designed to provide students with interdisciplinary knowledge and the ability to manage complex projects. The program emphasizes the connections between various disciplines, particularly chemistry, biology, and economics/law. Courses are designed to promote the exchange of methodological and technological knowledge, as well as to prepare students for the job market. Practical exercises associated with basic courses are considered highly relevant. The curriculum includes internships at university or other public or private institutions, aimed at completing the student's cultural and professional training. These internships provide hands-on experience in evaluation, biotechnology, IT, and regulatory and managerial fields. This also helps develop critical thinking, teamwork, and communication skills. The application of risk assessment for human health protection is covered within courses that explain the regulatory pathways for different substances and products. Graduates will develop critical thinking skills necessary for applying risk assessment tests and methodologies, and for creating innovative protocols in the fields of pharmaceutical biotechnology and related areas. They will also be able to independently evaluate the socio-economic impact of regulations, methodologies, and new risk assessment protocols. This development is facilitated through seminars and workshops that encourage critical evaluations of published work and scientific research. Graduates will be able to communicate complex information clearly and effectively, both with specialists and non-specialists. They will also be capable of presenting progress and innovations in risk assessment in English. The training received, including workshops and seminars, will allow them to communicate with audiences of diverse scientific backgrounds. Graduates will be able to independently acquire new knowledge through scientific articles, databases, and online resources, especially within formal courses and internships. They will also develop the ability to prepare and execute protocols, write reports, and conduct research in risk assessment and related fields.

The Master course anticipates that graduates will find employment in European and international institutions that deal with the protection of health and the environment, as well as companies in the chemical, agrochemical, pharmaceutical, and food sectors. The program also points out the importance of scientific expertise in risk evaluation and decision making, requiring professionals with expertise in areas such as toxicology, chemistry, epidemiology, environmental fate, exposure and risk management.

Professional profile and employment opportunities

SAXBI offers various career opportunities for graduates, with roles in research, safety evaluation, production, and quality certification. These positions span both public and private sectors and involve tasks such as designing scientific experiments, analyzing data, and ensuring regulatory compliance. More specifically:

Research roles are available in public and private research institutions. These positions require skills in experimental design, data analysis, and scientific communication, as well as knowledge of safety regulations for chemical and biological products. Specific employers include universities, the Istituto Superiore di Sanità, and various governmental agencies.

Safety evaluation roles involve gathering toxicological data, assessing risks, and establishing health-based guidance values. These roles require critical thinking, knowledge of safety regulations, and the ability to work in teams. Employment opportunities exist in the biotechnology, pharmaceutical, diagnostic, food, cosmetic, and chemical industries.

Production roles encompass production management, quality control, and formulation development. These positions require managerial and planning skills, as well as knowledge of safety regulations. The same industries that employ safety evaluators also employ production specialists.

Quality certification roles involve verifying quality management systems, analyzing company processes, and defining work procedures that comply with regulations. This requires knowledge of safety regulations and the ability to interface with various professionals. Opportunities are available in consulting firms and various industries.

The resultant job profiles will be available for recruitment in:
- public administration for the control, implementation and management of human health and environmental protection;

- industry Associations (Food, Cosmetics, Pharma, Chemicals);
- pharma Companies in the sector of drug development;
- biotech Companies;
- contract Research Organization for the drug toxicity testing;
- food and Chemical Companies in Quality Control divisions;
- bioremediation Companies;
- innovative energy plants;
- public and Private Companies for the implementation and application of appropriate RA procedures;
- private sectors as consultants for RA of chemicals, food contaminants, water and air pollutants;
- public and Private Research Institutions;
- universities and secondary schools;
- researcher at public and private research institutions;
- researcher in industry (research and development sector); - risk assessor in public and private organizations;
- quality certifier.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment. The agreements entered into by the University with over 300 universities from the 27 EU member countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organisations.

Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

The University of Milan is a member of the 4EU+ European University Alliance that brings together eight public multidisciplinary universities: University of Milan, Charles University of Prague, Heidelberg University, Paris-Panthéon-Assas University, Sorbonne University of Paris, University of Copenhagen, University of Geneva, and University of Warsaw. The 4EU+ Alliance offers integrated educational pathways and programmes to promote the international mobility of students (physical, blended and virtual).

How to participate in Erasmus mobility programs

The students of the University of Milan can participate in mobility programmes, through a public selection procedure.
Ad hoc commissions will evaluate:
· Academic career
· the candidate's proposed study programme abroad
· his/her foreign language proficiency
· the reasons behind his/her application

Call for applications and informative meetings
The public selection for Erasmus+ mobility for study generally begins around February each year with the publication of a call for applications specifying destinations and requirements. Regarding the Erasmus+ Mobility for Traineeship, the University of Milan usually publishes two calls a year enabling students to choose a destination defined by an inter-institutional agreement or to find a traineeship position on their own.
The University organises informative meetings to illustrate mobility opportunities and rules for participation.

Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which may be supplemented by the University funding for disadvantaged students.

Language courses
Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM). https://www.unimi.it/en/node/8/

Learn more at https://www.unimi.it/en/node/274/

For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
Contacts: InformaStudenti;
Student Desk booking through InformaStudenti

1st COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Bioremediation		7	(3) BIO/19, (4) BIO/13
Biotechnology and Pharmacotoxicology		10	BIO/14
Development Biology and Differentiation		6	BIO/13
Functional, Metabolic and Epigenetic Biochemistry		6	BIO/10
Methods of analysis of chemicals in water, air, biological fluids, tissues, food		6	(3) CHIM/01, (3) CHIM/06
Organ Physiopathology and Histopathology		10	(4) MED/04, (3) BIO/09, (3) VET/03
Regulatory Aspects in toxicology		6	(3) IUS/14, (3) CHIM/09
	Total compulsory credits	51	

2nd COURSE YEAR (available as of academic year 2026/27) Core/compulsory courses/activities common

Learning activity		Ects	Sector
Databases and Exposure scenarios		6	(3) MED/01, (3) INF/01
Pharmacogenetics and Epigenetics in Toxicology		6	BIO/14
Quantitative Chemical Structure and activity relationship		10	(5) BIO/10, (5) BIO/14
System Toxicity and Risk Assessment		7	BIO/14
	Total compulsory credits	29	

Elective courses

STUDENTS MUST CHOOSE AN OPTIONAL COURSE OF 8 ETCS.
These will be freely chosen among all courses provided by the University of Milan if the are compatible with the educational project, after consulting the Study Programme Committee. As an alternative, the student can also choose the Laboratory of Risk assessment 8 ETCS. This laboratory aims to deepen the theoretical and practical aspects of the research topic of the thesis and it will be agreed with the thesis tutor.
In addition, activities included in the University project for the development of soft skills can be chosen.
https://www.unimi.it/en/study/bachelor-and-master-study/following-your-programme-study/soft-skills

Laboratory of Risk assessment	8	ND

TO OBTAIN THE DEGREE, STUDENTS HAVE TO ACQUIRE AN ADDITIONAL 3 CREDITS (OTHER ACTIVITIES). More information in the "Study plan definition and submission for approval" and in “Language and Computer skills” above.

Additional Language Skills: Italian (3 ECTS)	3	ND
Other training activities *(i.e. meetings and seminars of experts in various fields inherent to the degree)*	3	NA

End of course requirements

Thesis		29	NA
	Total compulsory credits	29	