UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2020/21
BACHELOR
Medical Biotechnology (Classe L-2)
Enrolled from 2014/15 Academic Year

HEADING

Degree classification - Denomination and code:	L-2 Biotechnologies
Degree title:	Dottore
Length of course:	3 years
Total number of credits required to complete programme:	180
Years of course currently available:	1st , 2nd , 3rd
Access procedures:	Cap on student, student selection based on entrance test
Course code:	D47

PERSONS/ROLES

Head of Study Programme

Prof.ssa Raffaella Molteni

Tutors - Faculty

Dott.sa Rosaria Bassi - Tutor per laboratori e altre attività
Prof.ssa Elena Battaglioli - Tutor per l'orientamento
Dott.sa Federica Compostella - Tutor per la mobilità internazionale e l'Erasmus

Degree Course website

https://biotecnologiemediche.cdl.unimi.it/it

Dipartimento di Biotecnologie Mediche e Medicina Traslazionale sede di via Vanvitelli, 32 Phone 02/50317123
Email: biotecnologie.mediche@unimi.it

Link to degree course regulations

https://biotecnologiemediche.cdl.unimi.it/it/il-corso/biotecnologie-mediche

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

The course offers a solid grounding in chemistry, biology and computing; an excellent basis in the fields of biochemistry, molecular biology, physiology, pathology, applied human pharmacology; knowledge of the foundations of physiopathology and diagnostics; and a solid interdisciplinary understanding of the biotechnological methodologies used in the different fields of biotechnologies with medical uses. A particular focus is placed on the research, diagnostic, therapeutic, reproductive, forensic sectors, in compliance with regulations and taking into account ethical and bioethical issues.

The degree program prepare a professional figure with a good basic knowledge in molecular biomedical and technical practices, and skills in modern communication techniques, which allow to collaborate in the planning and implementation of biotechnological applications to man.

Expected learning outcomes

The graduated students in Medical Biotechmology will master knowledge and skills in each of the following field
the application of biotechnological techniques to support biomedical research and molecular diagnostics (DNA sequencing, PCR, in-situ hybridisation)
the production of vectors for experimental and gene therapy purposes
cell culture generation and maintenance
the generation of engineered cells for diagnostic and curative treatments
the generation of transgenic animals for the production of therapeutic proteins or xenografts
assistance with clinical trials of biotechnological medicines
assistance with the optimisation and personalisation of pharmacological therapy
the application of genomic medicine principles
clinical monitoring of biotechnological medicines
the application and development of biotechnology-based diagnostic tests; biotechnological trials and analyses
technical and scientific information in the biotechnological field.

Professional profile and employment opportunities

The programme is designed to prepare students capable to apply biotechnology protocols in the medical field and to collaborate on development programs and surveillance of biotechnologies applied to man considering also ethical, economic, and administrative aspects.
Medical Biotechnologies graduates can pursue careers in:
Universities and other public and private research bodies
National Health Service organisations, hospitals, specialist public and private laboratories
Pharmaceutical and biotechnological companies
Research and development centres for biotechnological diagnostic products in the health sector
Biotechnological service centres
Bodies in charge of drafting health and patent regulations regarding the utilisation of biotechnological products for the protection of human health

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

Study and internships abroad

The Degree programme in Medical Biotechnology supports cooperation opportunities and mobility with leading international universities, as well as the possibility for students to earn credits through exchange education and training programmes with Partner organizations.
Bilateral agreements with the University of Leuven (Katolieke Universiteit Leuven, Belgium)), the University of Lleida (Universitat de Lleida, Spain) and the LUMC (Leids Universitair Medish Centrum) of the University of Leiden (Netherland) are active in the framework of the Erasmus + programme. In recent years, a growing number of students have developed their professionalism and the European dimension of their training through residence periods abroad. Associated Universities represent highly recognized European institutions, featuring reference schools in biomedical sciences. The students will thus be offered exciting opportunities to enhance their CVs and evaluate their interest in extending their careers in an international setting.
The Degree course in Medical Biotechnology offers third year students the possibility to carry out practical training for the preparation of their final thesis work in one of the aforementioned institutions. The period abroad amounts to max. 3 months equivalent to 14 credits (8 CFUs from the practical side, + 6 CFUs from elective activities). A positive evaluation of the period abroad is required. The latter is defined by the tutor in the foreign university, the Unimi tutor and is subjected to the approval by the Unimi Didactic Council. Erasmus students who obtain outstanding results, proved by an official evaluation letter of the foreign tutor to the President of the Masters Commission, will be rewarded with an additional point in the final Laurea Grade.
Besides general informative meetings organized by the University, the Degree course in Medical Biotechnology provides specific support to interested/selected students through the organization of specific informative session and/or meeting with the tutor for mobility.

How to participate in Erasmus mobility programs

How to participate in Erasmus+ mobility programmes

The students of the University of Milan can participate in mobility programmes, which last 3 to 12 months, through a public selection procedure.
Ad hoc commissions will evaluate:
• 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 generally begins around February each year with the publication of a call for applications specifying the destinations, with the respective programme duration, requirements and online application deadline.
Every year, before the deadline for the call, the University organizes informative meetings to illustrate opportunities and rules for participation to students.

Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which is 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.

Learn more at https://www.unimi.it/en/international/study-abroad/studying-abroad-erasmus.

For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
E-mail: mobility.out@unimi.it
Desk opening hours: Monday to Friday 9 am - 12 noon

1st COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Applied physics		9	FIS/07
General and cellular biology		7	BIO/13
General and inorganic chemistry		8	CHIM/03
Genetics		7	BIO/13
Human anatomy and histology		7	(3) BIO/17, (4) BIO/16
Mathematics		6	MAT/03
Organic chemistry		8	CHIM/06
	Total compulsory credits	52	

Elective courses

2nd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Biochemistry and fundamentals of human biochemistry		11	BIO/10
Bioethical and legal issues in biotechnology		9	MED/02, IUS/01, AGR/01
General pathology and immunology		10	MED/04
Human molecular genetics		6	MED/03, BIO/13
Human physiology		7	BIO/09
Microbiology and medical virology		6	MED/07
Molecular biology		8	BIO/11
Techniques in molecular and cellular biology		10	(5) BIO/10, (5) BIO/13
	Total compulsory credits	67	

3rd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Applications of biotech on medicine		7	MED/40, MED/46, MED/44, MED/43, MED/08, MED/42
Biotechnologies in molecular diagnostics and fundamental of statistics		9	(4) MED/01, (5) MED/05, (4) MED/36, (5) BIO/12
Medical pharmacology		10	BIO/14
Physiopathology, introduction in biotechnologies diagnostic and therapy		9	(5) MED/13, (5) MED/15, (5) MED/09, (4) MED/26, (4) MED/18, (4) MED/06
Training		8	ND
	Total compulsory credits	43	

Elective courses

End of course requirements

Final examination		4	NA
	Total compulsory credits	4	

COURSE PROGRESSION REQUIREMENTS

The undergraduate Degree Course in Biotechnology requires compulsary propaedeutical exams listed in Table. For each of the learning activities which require propaedeutical exams, the student must take the examination of propedeutical courses (right column) before taking the exam on courses for which there are specific prerequisites (left column)

Learning activity	Prescribed foundation courses	O/S
Biochemistry and fundamentals of human biochemistry	General and inorganic chemistry	Core/compulsory
	Organic chemistry	Core/compulsory

Physiopathology, introduction in biotechnologies diagnostic and therapy	Biochemistry and fundamentals of human biochemistry	Core/compulsory
	General pathology and immunology	Core/compulsory
	Human physiology	Core/compulsory
Molecular biology	General and cellular biology	Core/compulsory
	Genetics	Core/compulsory
Techniques in molecular and cellular biology	General and cellular biology	Core/compulsory
	Genetics	Core/compulsory
Human molecular genetics	Molecular biology	Core/compulsory
	Techniques in molecular and cellular biology	Core/compulsory
Medical pharmacology	Biochemistry and fundamentals of human biochemistry	Core/compulsory
	Human molecular genetics	Core/compulsory
	General pathology and immunology	Core/compulsory
Biotechnologies in molecular diagnostics and fundamental of statistics	Biochemistry and fundamentals of human biochemistry	Core/compulsory
	Techniques in molecular and cellular biology	Core/compulsory
	General pathology and immunology	Core/compulsory
Applications of biotech on medicine	Techniques in molecular and cellular biology	Core/compulsory
	Human molecular genetics	Core/compulsory
	General pathology and immunology	Core/compulsory
General pathology and immunology	General and cellular biology	Core/compulsory
	Genetics	Core/compulsory
Microbiology and medical virology	General and cellular biology	Core/compulsory
Human physiology	Human anatomy and histology	Core/compulsory
	Applied physics	Core/compulsory