



UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2019/20
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 Anna Marozzi

Degree Course website

<http://users.unimi.it/biotecmediche/>

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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 Biotechnology 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 the international mobility of its students, offering them the opportunity to spend periods of study and training abroad, a unique opportunity to enrich their curriculum in an international context. To this end, the University adheres to the European Erasmus+ program within which agreements with over 300 universities in over 30 countries have been signed. Under this program, students can attend one of these universities in order to pursue training in substitution of part of the curriculum foreseen by the chosen study course, including internships at companies, research and training centers or other organizations, or even to prepare their thesis. The University also maintains relationships with several other prestigious foreign institutions offering similar opportunities even within higher study levels.

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 Medisch Centrum) of the University of Leiden (Netherlands) are and have been active for several years 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 interests in extending their careers in the international setting.

4 Positions are available for the Academic Year 2019-2020. 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 training activities chosen by the students). A positive evaluation of the period abroad will be required. The latter should be 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

Furthermore, the international programme provides the possibility to access the Erasmus + programme.

How to participate in Erasmus mobility programs

To gain access to mobility programs for study purposes, lasting 3-12 months, the enrolled students of the University of Milan, no later than the first year out of course, must attend a public selection that starts usually around the month of February each year through the presentation of specific competition announcements, which contain information on available destinations, respective duration of the mobility, requirements and deadlines for submitting the online application. Access criteria is a language A2 certification in the language to be spoken during the mobility. The selection, aimed at evaluating the proposed study abroad program of the candidate, knowledge of a foreign language, especially when this is a preferential requirement, and the motivations behind the request, is performed by specially constituted commissions. Each year, before the expiry of the competition announcements, the University organises information sessions for the specific study course or groups of study courses, in order to illustrate to students the opportunities and participation rules. To finance stays abroad under the Erasmus + program, the European Union assigns to the selected students a scholarship that - while not covering the full cost of living abroad - is a useful contribution for additional costs as travel costs or greater cost of living in the country of destination. The monthly amount of the communitarian scholarship is established annually at national level; additional contributions may be provided to students with disabilities.

In order to enable students in economic disadvantaged conditions to participate in Erasmus+ program, the University of Milan assigns further additional contributions; amount of this contributions and criteria for assigning them are established from year to year. The University of Milan promotes the linguistic preparation of students selected for mobility programs, organising every year intensive courses in the following languages: English, French, German and Spanish.

The University in order to facilitate the organisation of the stay abroad and to guide students in choosing their destination offers a specific support service.

More information in Italian are available on www.unimi.it > Studenti > Studiare all'estero > Erasmus+

For assistance please contact:
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 Desk opening hour: monday-friday 9 - 12

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 compulsory propaedeutical exams listed in Table. For each of the learning activities which require propaedeutical exams, the student must take the examination of propaedeutical 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