UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2018/19
BACHELOR
Biotechnology (Class L-2)
enrolled from 2014/15 academic year

HEADING	
Degree classification - Denomination and code:	L-2 Biotechnologies
Degree title:	Dottore
Curricula currently available:	Agri-food and environmental / Bio-industrial / Pharmaceutical / Veterinary
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:	K06

PERSONS/ROLES

Head of Interdepartmental Study Programme

Prof.ssa Donatella Taramelli

Tutors - Faculty

Prof.ssa Antonella Baldi, Prof. Paolo Landini, Prof. Francesco Molinari, Prof. Angelo Poletti, Prof.ssa Gabriella Tedeschi, Prof.ssa Maria Antonietta Vanoni, Prof. Alessio Scarafoni (per mobilità ERASMUS), Prof.ssa Marina Camera, Dr. Fabio Forlani, Prof.ssa Elena Crotti, Prof.ssa Gabriella Consonni.

Degree Course website

http://www.biotecnologia.unimi.it

Via Celoria, 20 Phone 800188128 (da cellulare 199188128) Verificare gli orari di apertura dello sportello sul sito www.unimi.it e www.unimi.infostudente.it

http://www.unimi.it/studenti/matricole/77598.htm

Via Celoria, 2 Phone 02503 16820 Libero c/o palazzina ex DISMA, 1° piano Email: alessio.scarafoni@unimi.it

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

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Expected learning outcomes

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Professional profile and employment opportunities

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Notes

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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.

Study and internships abroad

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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 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.

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:
Ufficio Accordi e relazioni internazionali
via Festa del Perdono 7 (ground floor)
Tel. 02 503 13501-12589-13495-13502
Fax 02 503 13503
E-mail: mobility.out@unimi.it
Desk opening hour: Monday-friday 9 - 12

1st COURSE YEAR Core/compulsory courses/activities common to all curricula

Learning activity	Ects	Sector
Fundamentals of economy and Bioethics	7	(3) MED/02, (4) AGR/01
General and inorganic chemistry	8	CHIM/03
General e Cellular Biology	10	BIO/13
Genetics	8	(8) AGR/07, (8) BIO/18
Mathematics for Biotechnology	6	(6) MAT/09, (6) MAT/01, (6) MAT/02, (6) MAT/03, (6) MAT/04, (6) MAT/05, (6) MAT/06, (6) MAT/07, (6) MAT/08
Organic chemistry	8	CHIM/06
Physics	6	(6) FIS/08, (6) FIS/07, (6) FIS/06, (6) FIS/05, (6) FIS/04, (6) FIS/03, (6) FIS/02, (6) FIS/01
Total compulsory credits	53	

2nd COURSE YEAR Core/compulsory courses/activities common to all curricula

Learning activity	Ects	Sector
Biochemistry	9	BIO/10
General Microbiology	9	BIO/19
Molecular Biology	9	BIO/11
Total compulsory credits	27	

COURSE YEAR UNDEFINED Core/compulsory courses/activities common to all curricula

Learning activity	Ects	Sector
English	1	L-LIN/12
Total compulsory credits	1	

Further elective courses common to all curricula

Lo studente deve acquisire 12 crediti a scelta.

End of course requirements common to all curricula

FINAL EXAM		5	ND
	Total compulsory credits	5	

ACTIVE CURRICULA LIST

Agri-food and environmental Course years currently available: 1°, 2°, 3°
Bio-industrial Course years currently available: 1°, 2°, 3°
Pharmaceutical Course years currently available: 1°, 2°, 3°
Veterinary Course years currently available: 1°, 2°, 3°

Procedure for choosing a curriculum

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CURRICULUM: [K06-A] Agri-food and environmental

2nd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Agri-food and environmental

Learning activity		Ects	Sector
Biomolecular methods		6	BIO/10
Botany and cropping systems		9	(9) AGR/02, (9) BIO/01, (9) AGR/04
Chemistry and Biochemistry of Agri-Food Molecules		8	(8) BIO/10, (8) CHIM/06
Plant physiology and biochemistry		8	AGR/13
	Total compulsory credits	31	

3rd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Agri-food and environmental

Learning activity		Ects	Sector
Careers in biotechnology		3	ND
Food Biotechnology		6	BIO/10
In vitro plant breeding		5	AGR/03
Integrated Plant Protection		10	(10) AGR/11, (10) AGR/12
Microbial agrobiotechnology		6	AGR/16
Plant genomics and breeding		12	AGR/07
	Total compulsory credits	42	

End of course requirements Curriculum-specific features Agri-food and environmental

Lab training		9	ND
	Total compulsory credits	9	

CURRICULUM: [K06-B] Bio-industrial

2nd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Bio-industrial

Learning activity		Ects	Sector
Animal cell biotechnology		6	(6) BIO/06, (6) BIO/13
Chemical methods for biotechnology		8	(8) CHIM/02, (8) CHIM/06
Fermentation Biotechnology		6	(6) BIO/11, (6) CHIM/11, (6) BIO/18
Plant Biology and Physiology		8	(8) BIO/18, (8) BIO/01, (8) BIO/04
	Total compulsory credits	28	

3rd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Bio-industrial

Learning activity	Ects	Sector
Biochemistry and molecular biology: applications in biotechnology	12	(12) BIO/11, (12) BIO/10
Bioinformatics and biostatistics	9	(9) MAT/09, (9) FIS/08, (9) MAT/01, (9) FIS/07, (9) MAT/02, (9) FIS/06, (9) MAT/03, (9) FIS/05, (9) MAT/04,

			(9) MAT/05, (9) FIS/04, (9) MAT/06, (9) FIS/03, (9) MAT/07, (9) FIS/02, (9) MAT/08, (9) FIS/01, (9) SECS-S/02, (9) SECS-S/01, (9) INF/01
Biotechnological processes for the production of natural compounds		6	CHIM/06
Careers in biotechnology		3	ND
Microbial biotechnology		6	(6) BIO/19, (6) BIO/18
Plant industrial biotechnology		9	(9) AGR/07, (9) BIO/18
	Total compulsory credits	45	

End of course requirements Curriculum-specific features Bio-industrial			
Lab training		9	ND
	Total compulsory credits	9	

CURRICULUM: [K06-C] Pharmaceutical

2nd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Pharmaceutical			
Learning activity		**Ects**	**Sector**
Human physiology and basic anatomy		10	BIO/09
Informatics and Statistics for Biotechnologies		6	(6) BIO/10, (6) SECS-S/01, (6) INF/01, (6) CHIM/06
Methods in Cell Biology and Biochemistry		6	(6) BIO/10, (6) BIO/13
Pharmacology		8	BIO/14
	Total compulsory credits	30	

3rd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Pharmaceutical			
Learning activity		**Ects**	**Sector**
ANALYTICAL METHODS FOR PHARMACEUTICAL BIOTECHNOLOGIES		7	(7) CHIM/01, (7) CHIM/08
Generale Pathology, Immunology and Medical Microbiology		10	(7) MED/04, (3) MED/07
Medicinal Chemistry and Bioprocesses		10	(10) CHIM/11, (10) CHIM/08
Pharmaceutical Technology and Legislation of Biotechnological Medicinal Products		6	CHIM/09
Pharmacological and toxicological biotechnology		10	BIO/14
	Total compulsory credits	43	

End of course requirements Curriculum-specific features Pharmaceutical			
Lab training		9	ND
	Total compulsory credits	9	

CURRICULUM: [K06-D] Veterinary

2nd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Veterinary			
Learning activity		**Ects**	**Sector**
Animal physiology and assisted reproduction		9	(9) VET/10, (9) VET/02
Comparative and laboratory animal pathology		7	VET/03
Development, morphology and function of organs and systems		9	VET/01
Veterinary microbiology and immunology		7	VET/05
	Total compulsory credits	32	

3rd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Veterinary			
Learning activity		**Ects**	**Sector**
Biotechnology applied to animal nutrition and animal origin food		11	(6) AGR/18, (5) VET/04
Computer skills		3	ND
Infection diseases and zoonosis		5	VET/05
Molecular genetics and animal models		8	(8) AGR/17, (8) AGR/20
Molecular parasitology and parasitic diseases		6	VET/06
Veterinary pharmacology and biotechnology law		9	(9) VET/07, (9) VET/08
	Total compulsory credits	42	

End of course requirements Curriculum-specific features Veterinary			
Lab training		8	ND

	Total compulsory credits	8	

COURSE PROGRESSION REQUIREMENTS

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Learning activity	Prescribed foundation courses	O/S
Biochemistry	General and inorganic chemistry	Recommended
	General e Cellular Biology	Recommended
	Physics	Recommended
	Organic chemistry	Recommended
	Genetics	Recommended
Bioinformatics and biostatistics	Molecular Biology	Recommended
	Genetics	Recommended
Plant Biology and Physiology	General and inorganic chemistry	Core/compulsory
	General e Cellular Biology	Core/compulsory
	Organic chemistry	Recommended
	Genetics	Recommended
Fermentation Biotechnology	Biochemistry	Recommended
	General Microbiology	Recommended
Biotechnological processes for the production of natural compounds	Organic chemistry	Core/compulsory
Biochemistry and molecular biology: applications in biotechnology	Biochemistry	Recommended
	Molecular Biology	Recommended
	General and inorganic chemistry	Recommended
	Genetics	Recommended
Plant industrial biotechnology	Genetics	Recommended
Microbial biotechnology	General Microbiology	Recommended
Molecular genetics and animal models	Genetics	Core/compulsory
Infection diseases and zoonosis	General Microbiology	Core/compulsory
Pharmaceutical Technology and Legislation of Biotechnological Medicinal Products	Pharmacology	Core/compulsory
	General and inorganic chemistry	Core/compulsory
	Methods in Cell Biology and Biochemistry	Core/compulsory
	Organic chemistry	Core/compulsory
ANALYTICAL METHODS FOR PHARMACEUTICAL BIOTECHNOLOGIES	Biochemistry	Core/compulsory
	General and inorganic chemistry	Core/compulsory
	Physics	Core/compulsory
	Organic chemistry	Core/compulsory
Pharmacological and toxicological biotechnology	Biochemistry	Core/compulsory
	Pharmacology	Core/compulsory
	Human physiology and basic anatomy	Core/compulsory
Pharmacology	General e Cellular Biology	Core/compulsory
Generale Pathology, Immunology and Medical Microbiology	Biochemistry	Core/compulsory
	Human physiology and basic anatomy	Core/compulsory
	General Microbiology	Core/compulsory
Medicinal Chemistry and Bioprocesses	Biochemistry	Core/compulsory
	General and inorganic chemistry	Core/compulsory
	Organic chemistry	Core/compulsory
Human physiology and basic anatomy	General e Cellular Biology	Recommended
	Physics	Recommended
Microbial agrobiotechnology	Biochemistry	Recommended
	Molecular Biology	Recommended
	General Microbiology	Core/compulsory
Integrated Plant Protection	General e Cellular Biology	Core/compulsory
	Plant physiology and biochemistry	Core/compulsory
	Botany and cropping systems	Core/compulsory
Food Biotechnology	Biochemistry	Recommended
	Biomolecular methods	Recommended
Plant genomics and breeding	Molecular Biology	Recommended
	Biomolecular methods	Recommended
	Genetics	Core/compulsory