UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2024/25
MASTER DEGREE
Veterinary Biotechnology Sciences (Classe LM-9)
Enrolled student since 2023/2024 academic year

HEADING	
Degree classification - Denomination and code:	LM-9 Pharmaceutical, veterinary and medical biotechnologies
Degree title:	Dottore Magistrale
Curricula currently available:	Gametes, cells, tissues: applications for reproduction and therapy / Advanced techniques for disease control and biosafety
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 , 2nd
Access procedures:	Open, subject to entry requirements
Course code:	H52

PERSONS/ROLES

Head of Study Programme

prof. Michele Mortarino

Tutors - Faculty

Tutor per l'orientamento: Prof.sa Lauretta Turin, Prof. Michele Mortarino

Tutors per la mobilità internazionale e l'Erasmus: Prof.sa Federica Bellagamba, Prof. Gabriele Brecchia, Prof.sa Carlotta Giromini.

Tutors per i piani di studio e riconoscimento crediti: Prof.sa Chiara Bazzocchi, Prof.sa Tiziana Brevini, Prof.sa Francesca Caloni, Prof.sa Federica Cheli, Prof. Michele Mortarino, Prof.sa Gabriella Tedeschi.

Tutor per stage e tirocini: Prof.sa Federica Riva, Prof.sa Elisa Maffioli, Prof. Michele Mortarino, Prof.sa Lauretta Turin

Tutor per i laboratori e altre attività: Prof.sa Chiara Bazzocchi, Dr.ssa Cristina Cozzi, Dr.ssa Giulietta Minozzi

Commissione Ammissione Magistrale: prof.ssa Chiara Bazzocchi, prof.ssa Tiziana Brevini, prof.ssa Francesca Caloni, prof.ssa Federica Cheli, prof. Michele Mortarino, prof.ssa Gabriella Tedeschi.

Degree Course website

https://www.unimi.it/it/corsi/corsi-di-laurea/scienze-biotecnologiche-veterinarie

Via dell'Università, 6 - Lodi La segreteria riceve su appuntamento tramite sevizio informastudenti nei seguenti orari: Martedì h 13:00-15:00 tramite piattaforma Teams Mercoledì h. 9:00-12:00 tramite piattaforma Teams Giovedì h. 13:00-15:00 in presenza

https://www.unimi.it/it/studiare/servizi-gli-studenti/segreterie-informastudenti

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

To provide the graduating students with:

a) an adequate training to develop scientific methodologies, to coordinate national and international research activities

b) the expertise in the fields of veterinary biotechnologies, including veterinary microbiology and immunology, animal pathology, diagnostics, infectious and parasitic diseases, zoonosis, pharmacology and toxicology, animals productions and reproduction, genetic improvement and biodiversity preservation, animal nutrition and food safety, development of animal models for biomedical studies, as well as the main rules regulating veterinary biotechnology.

Expected learning outcomes

Following what suggested by the Dublin Descriptors, the Master Course of Veterinary Biotechnological Sciences will provide the graduated with the following expertise:

Knowledge and understanding

The graduated in Master course of Veterinary Biotechnological Sciences are supposed to have acquired the theoretical and practical knowledge in the field of biotechnologies applied to veterinary medicine during their bachelor studentship. These qualifications include: molecular diagnostics, the preservation of animal biodiversity by means of applied genetics, the control of human health through the control of the safety of food from animal origin, the control of zoonosis, the development of animal models for human diseases, the study of techniques focused on animal productions and animal reproduction. The graduated in Master course of Veterinary Biotechnological Sciences will integrate this knowledge with those acquired during the present master study, improving their capability to apply their knowledge to multidisciplinary topics. The teaching program will also take advantage of seminars and workshops, provided by experts from different disciplines, who will discuss the last updates in their studying areas.

Applying knowledge and understanding

The graduated in the Master course of Veterinary Biotechnological Sciences will apply their knowledge to specific areas in the field of veterinary biotechnology, such animal nutrition and food safety, animal diseases and diagnostics in the field of pathology, microbiology and immunology, infectious and parasite diseases, zoonosis, veterinary pharmacology and toxicology, animal production and reproduction, genetic improvement and preservation of biodiversity, development of animal models, management and marketing techniques related to R&D in an industrial frame.

Making judgements

The graduated in the Master course of Veterinary Biotechnological Sciences will develop a skill in making judgments to design and carry out investigations in veterinary and animal science biotechnologies, and close fields as well. Students will be exposed to seminars and workshops aimed at developing this judgment making capability. The final part of the student career will be devoted to the preparation of an experimental master thesis, which might also be carried out in external research laboratories, In Italy or in other countries.

Communication

The graduated in the Master course of Veterinary Biotechnological Sciences will be able to communicate with their peers, the larger scholarly community and with society in general about the area of veterinary biotechnology and in close disciplines to specialist and non-specialist audiences clearly and unambiguously. Their communication ability will be verified at the end of the course, though the evaluation of their master thesis presentation and discussion.

Lifelong learning skills

The graduated in the Master course of Veterinary Biotechnological Sciences will acquire the ability to improve the knowledge in the field of veterinary biotechnology and close disciplines, not limited to the field of animal sciences. The learning skills will be verified through seminars, individual tutoring and the writing of the thesis.

Professional profile and employment opportunities

The graduated in the Master course of Veterinary Biotechnological Sciences will find his/her ideal employment profile in the following R&D environments:

• Universities
• Public and private research institutions.
• Pharmaceutical, diagnostic and biotechnological companies
• Food and feed processing companies
• The graduated in the Master course of Veterinary Biotechnological Sciences will also find his/her employment in the management function of Quality control, Clinical and pre-clinical monitoring in the veterinary and human medicine fields, scientific information and sale representative activities, Management of animal breeding and genetic selection activities, control quality in feed and food preparation industries, environmental safety,

Notes

In order to get their degree, students are required to certify their knowledge of the English language at the B2 level. This level can be certified in one of the following ways:

· By submitting their language certificate, taken no more than 3 years before its submittal and attesting a B2 o higher level (for the list of the language certificates which are accepted by the University of Milan, please refer to the website: http://www.unimi.it/studenti/100312.htm).

Students can submit their language certificate during the immatriculation procedure or send it to the Language Centre of the University of Milan (SLAM) via the Infostudente service.

· By sitting the placement test run by SLAM, during the first year exclusively, from September to December. Should they not pass the Placement Test, students will have to attend the English language course organized by SLAM. All students who do not have a valid language certificate must sit the Placement Test. Those students who do not sit the Placement test by December or do not pass the end of course test in one of the 6 attempts granted will have to get a language certificate outside the University of Milan within their degree.

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 organizations.

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

Study and internships abroad

Students of Veterinary Biotechnological Sciences have the opportunity to spend a term (from 3 to 12 months) in the universities with whom the School has developed bi-lateral agreement, which for 2015-2016 Academic Year include The University of Warmia and Mazury, Oltzyn (Poland), The university of Bonn (Germany), The Autonomous University of Barcelona (Spain), The University of Ljubljana (Slovenia) and the University of Rijeka (Croatia). It is possible to combine courses with a graduating thesis stage, provided that an Internal Tutor (Italian) and external Tutor (from the country where the student will spend his Erasmus + period) are available. ECTS will be acknowledged following the learning agreement signed, as included by bi-lateral agreement between Universities.
The Program of Veterinary Biotechnological Sciences also offers the opportunity for a traineeship regulated by Erasmus + Traineeship program (former Erasmus placement). The program is activated in the frame of a scientific cooperation between a researcher group belonging to the School and others from foreign institution. Erasmus + Traineeship is financed by scholarship from the University of Milano.

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, 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 organizes 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; mobility.out@unimi.it
Student Desk booking through InformaStudenti

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

Learning activity	Ects	Sector

Biotechnologies:experimental models in research	12	(4) VET/07, (5) AGR/18, (3) AGR/20
Cellular communication and signal transduction	10	(6) BIO/10, (4) BIO/09
EPIDEMIOLOGY, BIOSTATISTICS AND BIOINFORMATICS	8	(3) AGR/17, (5) VET/05
Ethiopathogenesis of hereditary and parasitic diseases	6	(3) VET/06, (3) AGR/17
Molecular Microbiology	10	(4) MED/04, (3) BIO/19, (3) MED/07
Morphological and molecular basis of the Central Nervous System and its Pathologies	8	(5) VET/01, (3) VET/03
Omics	10	(7) BIO/10, (3) BIO/18
Total compulsory credits	64	

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

Learning activity	Ects	Sector
Final examination	19	NA
Total compulsory credits	19	

Elective courses common to all curricula

In the II year, integrated courses will be activated courses (eight credits) aimed to offer students the opportunity to further deepen preparation in specific areas of Biotechnological Veterinary Sciences and can be chosen by the students. The acquisition of the eight CFU is subject to passing the related tests by the students, with the vote of thirty.
The 'Scientific Innovation and Legal Challenges of Food Regulation' course is included in the 'Jean Monnet' internationalization project, and it accounts for 6 ECTS credits and 42 hours. This will be complemented with 6 hours of biotechnological seminar activities, resulting in a total of 48 hours. Consequently, the student must gain at least an additional 2 ECTS credits through another elective educational activity.

	8	(3) VET/08, (3) VET/01, (2) BIO/12
	8	(2) AGR/19, (2) VET/06, (2) BIO/10, (2) VET/04
Biobanking	8	(5) VET/09, (3) VET/10
Biotechnologies for innovation and sustainability of animal health and production	8	(3) VET/07, (2) VET/06, (3) AGR/18
Biotechnologies to understand and fight Aging	8	(1) BIO/10, (5) VET/01, (2) VET/03
Comparative Immunopatology	8	(5) VET/03, (3) VET/05
Extracellular vesicles and reproductive mechanisms: the rabbit as an animal model	8	(3) VET/10, (2) VET/01, (3) VET/02
From 3D-culture and 3D-printing to organoids	8	(3) AGR/18, (2) VET/09, (3) VET/01
Imaging techniques in bio-medical research	8	(2) BIO/10, (6) VET/01
Molecular pathology and parasitology	8	(2) VET/06, (6) VET/03
Nutrition and biodiversity in gut microbiota/health	8	(6) AGR/18, (2) VET/05
Scientific innovation and legal challenges of food regulation	6	(2) AGR/18, (4) IUS/08
Vaccinology	8	(2) AGR/18, (6) VET/05

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

Learning activity	Ects	Sector
English proficiency B2 (3 ECTS)	3	ND
Total compulsory credits	3	

Further elective courses common to all curricula

MANDATORY ACTIVITIES COMMON TO ALL CURRICULA.

The student has to obtain 4 cfu as indicated below:
- n. 2 cfu for further training activities related to stage, orientation
- n. 2 cfu for further languages skills

ACTIVE CURRICULA LIST

Gametes, cells, tissues: applications for reproduction and therapy Course years currently available: 1st , 2nd
Advanced techniques for disease control and biosafety Course years currently available: 1st , 2nd

Qualifying Training Objectives

To investigate biotechnological aspects related to assisted animal reproduction, the application of stem cells in the biotechnological field and the development of alternative methods to animal experimentation.

Skills acquired

Knowledge of principles and techniques in assisted animal reproduction, the use of stem cells in the biotechnological field and the development of alternative methods to animal experimentation.

Professional profile and employment possibilities

Graduates from the master degree programme in Veterinary Biotechnology Sciences can pursue careers in the following professional spheres. Scientific research and technological development in:
public and private universities;
public facilities (the National Health Institute, the National Research Council (CNR), the National Environment Agency, Experimental Veterinary Preventive Medicine Institutes, Research Institutes);
the pharmaceutical, diagnostic and biotechnological industries;
the food, food processing and fodder industries;
public and private pre-clinical research facilities in the medical and veterinary fields;
the management of quality control;
clinical monitoring activities;
regulation, management and biotechnological corporate creation procedures in the public and private spheres.
Graduates can assume managerial and consulting roles in the following fields:
therapeutic, with particular reference to the development and trial of innovative products with therapeutic capacities for animal pathology and the use of animal models for biomedical studies and cellular therapy;
patent design and production in the health field;
diagnostics, through the management of molecular analysis technologies and cellular biotechnologies applied to the health and environment fields;
animal reproduction, for the preservation of animal biodiversity and species at risk of extinction;
quality control for foods of animal origin in the food industry;
quality control for fodder and products in the fodder industry;
technological research and design for the selection and management of animal species;
genetic variability and animal husbandry control in relation to the preservation of biodiversity;
the design and development of biotechnologies with clinical and therapeutic uses in a multidisciplinary context;
technical and scientific pharmaceutical information;
the valuation and control of environmental security.

2nd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Gametes, cells, tissues: applications for reproduction and therapy

Learning activity		Ects	Sector
Biotechnologies applied to Reproduction, Development and Regenerative Medicine		12	(6) VET/10, (6) VET/01
Functional genomics and the molecular basis of differentiation		8	(4) VET/06, (4) AGR/17
In Vitro Model Technologies		6	(3) VET/07, (1) VET/01, (2) VET/02
	Total compulsory credits	26	

CURRICULUM: [H52-E] Advanced techniques for disease control and biosafety

Qualifying Training Objectives

To investigate biotechnological aspects relevant to disease control and nutritional safety, research strategies in the field of infectious diseases, parasitology, health and animal production.

Skills acquired

Knowledge of principles and techniques for the control of food safety diseases, infectious diseases, parasitology, health and animal production.

Professional profile and employment possibilities

Graduates from the master degree programme in Veterinary Biotechnology Sciences can pursue careers in the following professional spheres. Scientific research and technological development in:
public and private universities;
public facilities (the National Health Institute, the National Research Council (CNR), the National Environment Agency, Experimental Veterinary Preventive Medicine Institutes, Research Institutes);
the pharmaceutical, diagnostic and biotechnological industries;
the food, food processing and fodder industries;
public and private pre-clinical research facilities in the medical and veterinary fields;
the management of quality control;
clinical monitoring activities;
regulation, management and biotechnological corporate creation procedures in the public and private spheres.

Graduates can assume managerial and consulting roles in the following fields:
therapeutic, with particular reference to the development and trial of innovative products with therapeutic capacities for animal pathology and the use of animal models for biomedical studies and cellular therapy;
patent design and production in the health field;
diagnostics, through the management of molecular analysis technologies and cellular biotechnologies applied to the health and environment fields;
animal reproduction, for the preservation of animal biodiversity and species at risk of extinction;
quality control for foods of animal origin in the food industry;
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technological research and design for the selection and management of animal species;
genetic variability and animal husbandry control in relation to the preservation of biodiversity;
the design and development of biotechnologies with clinical and therapeutic uses in a multidisciplinary context;
technical and scientific pharmaceutical information;
the valuation and control of environmental security.

2nd COURSE YEAR Core/compulsory courses/activities Curriculum-specific features Advanced techniques for disease control and biosafety			
Learning activity		**Ects**	**Sector**
From cell to farm: methods and technologies applied to animal nutrition and food quality		10	(5) AGR/19, (5) AGR/18
Molecular Virology		8	(3) VET/03, (5) VET/05
Research strategies and methodologies applied to disease study and control		8	(5) VET/06, (3) VET/05
	Total compulsory credits	26	