



**UNIVERSITA' DEGLI STUDI DI MILANO**  
**PROGRAMME DESCRIPTION - ACADEMIC YEAR 2018/19**  
**MASTER DEGREE**  
**Biology Applied to Research in Biomedicine (Classe LM-6)**  
**Enrolled from 2011/2012 academic year**

### HEADING

<b>Degree classification - Denomination and code:</b>	LM-6 Biology
<b>Degree title:</b>	Dottore Magistrale
<b>Length of course:</b>	2 years
<b>Credits required for admission:</b>	180
<b>Total number of credits required to complete programme:</b>	120
<b>Years of course currently available:</b>	1st , 2nd
<b>Access procedures:</b>	Open, subject to completion of self-assessment test prior to enrolment
<b>Course code:</b>	F92

### PERSONS/ROLES

**Head of Study Programme**

Prof. Mirko Baruscotti

**Degree Course Coordinator**

Prof.ssa Graziella Cappelletti

**Tutors - Faculty**

Proff. Alida Amadeo, Andrea Barbuti, Graziella Cappelletti, Saverio Minucci, Andrea Mosca, Paola Sacerdote, Elisabetta Tanzi.

**Degree Course website**

<http://www.ccdbiol.unimi.it>

via Celoria, 26 - 2° piano torre A. Orari di apertura dello Sportello Didattica: dal lunedì al venerdì, dalle ore 10:00 alle 11:45. Sito web: <http://www.ccdbiol.unimi.it> Email: [cl.biol@unimi.it](mailto:cl.biol@unimi.it)

via Celoria, 20 Phone 199188128 Per gli orari di apertura consultare il sito <http://www.unimi.it/studenti/segreteria/773.htm> E-mail: [www.unimi.infostudente.it](http://www.unimi.infostudente.it) (previa registrazione)

via Celoria, 26 - 2° piano torre A. Orari di apertura: dal lunedì al venerdì, dalle ore 10:00 alle 11:45. Sito web: <http://www.ccdbiol.unimi.it>

<http://www.unimi.it/studenti/matricole/77648.htm>

<http://users.unimi.it/barb/home/index.php>

### CHARACTERISTICS OF DEGREE PROGRAMME

**General and specific learning objectives**

The Master of Science (M.Sc.) programme in BIOLOGY APPLIED to BIOMEDICAL RESEARCH (BARB, Class LM-6 Biology) aims to provide students with the theoretical and practical knowledge necessary to manage individually or in collaboration with other professional figures their research in both basic and applied aspects of the biomedical field.

The new M.Sc. in BARB proposes the basic flexible scheme applied previously and introduces some substantial new features that allow a better characterization of the biomedical aspects of the M.Sc. programme and a better identification of the professional figure of the biomedical scientist and its role in all aspects of basic/applied research activities.

Specific educational aims are:

- 1) to provide students with the basic notions of biological processes underlying the physiology of organs and systems, their pathological dysfunctions and their modulation by pharmacological and other interventions, specifically in man.
- 2) to teach students how to apply theoretical notions to applications of biomedical interest for humans and in relation to the interaction with the environment;
- 3) to provide tools for understanding and practicing theoretical knowledge in the lab;
- 4) to foster the most updated knowledge in the biomedical field by use of specific teaching modules whose content will be continuously refreshed.

The M.Sc. in BARB strengthens an essential, culturally basic branch of Biology in which the Coordinating Board for teaching activities in Biology has full competence, both in terms of teaching tradition and established research expertise. The

M.Sc. programme aims to provide advanced theoretical and practical knowledge in the continuously growing areas of biology applied to biomedical research, and make students able to propose and to act with the purpose of further advancing their knowledge and practical experience. From this perspective students will be addressed to a specific teaching project whose target is to strengthen the attitude to develop new ideas and new tools in the most advanced aspects of biomedical research.

### **Professional profile and employment opportunities**

The M.Sc graduates in BARB achieve a specific and updated knowledge of theoretical and experimental features of the field of biomedical research, based on the acquisition of biological principles which govern mechanisms and vital processes in humans.

Theoretical acquisitions are accompanied by detailed know-how of the most advanced technologies used in biomedical research relevant to aspects of basic research as well as research applied to Health Service and biomedical industry, able to provide the graduate with a high degree of professional self-determination and the capability to get involved in the progress of biomedical research and all its applications to the practical field.

The Master graduate in BARB will be able to:

- 1) work in public and private agencies involved in biomedical research activity both in European and non-European countries such as Universities, hospitals, research centers, State and Regional institutions, pharmaceutical companies and others;
- 2) get involved in the development of new biomedical and healthcare technologies in the industrial field;
- 3) contribute with managerial role in work organization in public and private laboratories of clinical analysis.

The M.Sc. graduate in BARB can enroll, by passing the exam for the profession, in the Biologists' Professional Register (section A), with the title of "Biologist", to perform the activities recognized by the Italian law.

### **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**

BARB students are given the opportunity to spend part of their curriculum abroad, at a University within the European Union (EU) in the frame of the Erasmus+ program of the European Commission. BARB students can attend courses and take exams that can be included in the core curriculum and/or perform the experimental thesis work in several European Universities localized in Belgium, Netherlands, Norway, UK- where courses taught in English are active – France, Germany, Poland, Spain and Portugal (see <http://www.dbs.unimi.it/extfiles/unimidire/59401/attachment/elenco-degli-accordi-attivi.pdf>). The admitted student will present a study plan including all the activities he/she intends to perform abroad, detailing the corresponding CFU: the number of proposed CFU should roughly correspond to those the student would achieve in the same time lapse remaining in his/her university. The study plan proposed by the student within the Erasmus+ program should be coherent with the BARB Master course and must be evaluated and approved by the Teaching Board. The Teaching Board, if necessary, will require the student to integrate the program of exams taken abroad. At the end of the Erasmus + program, according to the rules established by the Academic Senate, the approved exams will be recorded, possibly with the original denomination, as part of the student's curriculum upon conversion of the European Credit Transfer and Accumulation System (ECTS) into CFU. If the student performs the experimental thesis work abroad, he/she must follow the rules outlined below (see Caratteristiche tirocinio).

#### **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](http://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](mailto:mobility.out@unimi.it)

Desk opening hour: Monday-friday 9 - 12

<b>1st COURSE YEAR Core/compulsory courses/activities common</b>		
<b>Learning activity</b>	<b>Ects</b>	<b>Sector</b>
ENGLISH ADVANCED	3	L-LIN/12
EPIDEMIOLOGIC AND PREVENTIVE SCIENCES	6	MED/42
HUMAN ANATOMY AND NEUROANATOMY	6	BIO/06
MOLECULAR BIOLOGY APPLIED TO THE BIOMEDICAL RESEARCH	6	BIO/11
PATHOLOGY	6	MED/04
PRINCIPLES OF PHYSIOLOGY	6	BIO/09
SYSTEM PHARMACOLOGY	6	BIO/14
Total compulsory credits		39
<b>Further elective courses</b>		
BIOCHEMISTRY OF SIGNAL TRANSDUCTION AND MEMBRANE BIOPHYSICS	6	FIS/07
CELLULAR AND MOLECULAR MICROBIOLOGY	6	BIO/19
DIFFERENTIATION BIOLOGY AND CELL THERAPIES	6	BIO/17
HUMAN AND MOLECULAR GENETICS	6	(6) MED/03, (6) BIO/18
CELLULAR AND MOLECULAR PATHOLOGY	6	MED/04
CELLULAR AND MOLECULAR PHARMACOLOGY	6	BIO/14
CELLULAR AND MOLECULAR PHYSIOLOGY	6	BIO/09
CLINICAL MICROBIOLOGY AND HYGIENE	6	(6) MED/07, (6) MED/42
CLINICAL MOLECULAR BIOLOGY	6	BIO/12
ECOTOXICOLOGY	6	BIO/14
NEUROPHYSIOLOGY	6	BIO/09
PHYSIOLOGY AND PHARMACOLOGY OF THE ENDOCRINE SYSTEM	6	(6) BIO/09, (6) BIO/14
TECHNIQUES FOR ADVANCED BIOMEDICAL RESEARCH	6	BIO/09
CELLULAR, MOLECULAR AND FUNCTIONAL APPROACHES TO GENETIC DISEASE	6	BIO/14
<b>End of course requirements</b>		
FINAL EXAM	39	NA
Total compulsory credits		39