MASTERS DEGREE COURSE IN MEDICAL BIOTECHNOLOGIES
Faculty of Pharmacy and Medicine - Faculty of Medicine and Psychology

Regulations regarding the course for the 2018/2019 academic year.

In the 2009-2010 academic year at the I and II Faculty of Medicine (currently Faculty of Pharmacy and Medicine and Faculty of Medicine and Psychology), the Masters Degree in Medical Biotechnology was activated (Class LM-9, Medical Biotechnology, veterinary and pharmaceutical), which will hereinafter be referred to as CLMBM, and is organized in accordance with Ministerial Decree 270/2004. This course is divided into the Biomolecular and Bioengineering curricula.

1. Organs and functioning of CLM in Medical Biotechnology:

The Masters Degree in Medical Biotechnology (CLMBM) relies on the Degree Course Committee, the Planning and Evaluation Commission of the teaching activities and the Quality Assurance Commission (QA) of the Study Programme.
The Degree Course Committee is composed of:
- The President: Prof. Angela Santoni
- All associate Professors and Researchers with a teaching assignment, including tempoary professors
- Student representatives, elected by students in a number equal to 15% of the number of Teachers of the Council, including temporary professors.

The Planning and Evaluation Commission of the teaching activities consists of:
- The President: Prof. Angela Santoni
- Semester Coordinators:

I Year: I Semester, Prof. Marco Tripodi - II Semester, Prof. Cristina Cerboni
II Year (Biomolecular curriculum): I Semester, Prof. Anna Guarini - II Semester: Prof. Lucia Di Marcotullio
II Year (Bioengineering curriculum): I Semester, Prof. Laura Amicone - II Semester: Prof. Fabio Babiloni

- Administrative Assistant: Dr. Oriana D'Angelo Gargano

The Quality Assurance Commission of the Degree Programme, whose composition is updated about once a year, includes the participation of the President of the CdS, of at least one teacher of the CdS, of at least one student representative and a team of technical and administrative support staff.
This Commission operates on the indications provided by the Quality Assurance Team on the basis of Guidelines regarding the self-assessment of the courses, in line with relevant legislation, the strategic guidelines of the University and national and European guidelines.
The Commission works with the Monitoring Committee and with the Joint Teaching Commission - Students of the Faculty of Pharmacy and Medicine.
It is the responsibility of the Commission to plan and monitor actions aimed at improving the quality of the Course, as well as verifying the implementation of the actions foreseen, through the correct use of the resources available and within the deadlines foreseen.

To this end, the Commission examines the information provided by the University, the National Student Registry, and the AlmaLaurea University Consortium, together with internal data collected by teachers, students and secretarial offices. This information provides the basis for the self-assessment of the Study Programme, which is included in the Review Reports and the Data Monitoring Sheets.

2. Specific educational objectives of the course and description of the study path

CLM in Medical Biotechnology aims to provide students with scientific and professional skills in the various areas related to Biotechnology in the Biomolecular or Bioengineering sector, through a multidisciplinary form of scientific training which combines theoretical knowledge and operational skills.

In the first year of the two-year specialization course, students will further develop their understanding of the molecular basis of cellular functions; the cognitive foundations of cellular biotechnology; morphological and functional sciences and techniques; virology and molecular parasitology; biochemistry and structural biology, together with bioinformatics and protein engineering; immunology and immunopathology; molecular and cellular pathology.

In the second year of the course, students have the to choose between a biomolecular curriculum which concentrates more on the application of biotechnologies to medical disciplines, and bioengineering which mainly concentrates on the application of biotechnologies to surgery.

The first curriculum offers graduates the chance to further their knowledge of genetic pathology and human genetics, also with reference to the biotechnology of human reproduction; molecular medicine and animal models of disease; regenerative medicine; pharmacology and molecular therapies; molecular diagnostics and imaging.

The second curriculum offers students the chance gain a deeper understanding of clinical applications and biomaterial pathology; of mechanical bioengineering and its clinical applications; of cellular, tissue and organ bioengineering; biotechnological techniques used in surgery; of electronic bioengineering and its clinical applications; of telemedicine and robotics.

In both curricula, students also study the ethical, deontological and legal knowledge required to work in biotechnology applied in the human field. The aim of the Course is also to provide information regarding the organization of health and safety in the laboratory, the certification methods of laboratories and quality checks.

The study path is organized in semesters. The courses are structured as integrated courses and provide both frontal teaching activities and practical laboratory exercises in various areas of medical technologies.

3. Career opportunities

Graduates in Medical Biotechnology have the necessary skills to work in the following areas:

- Universities and other public and private institutions interested in biotechnological, biomedical and bioengineering research
- Industry, in particular pharmaceuticals, biotechnology diagnostics, cosmetology, fine chemicals, biomedical products
- Structures of the National Health System
- Multi-disciplinary prevention devices (PMP)
- Legal Medical Facilities
- National and international regulatory agencies
- Monitoring of clinical trials (Clinical Research Associate - CRA, Clinical Monitor - CM)
- Technology transfer companies
- Companies involved in publishing and scientific communication

• Charities
• Sectoral associations (scientific, industrial, patient)
• Patenting associations involved in the exploitation of biotechnological products

4. Admission requirements

Admission to CLM in Medical Biotechnology is subject to possession of pre-determined curricular requirements and performance in an admission test.

4.a Curricular requirements:

4.a.a Applicants must have obtained a Degree in one of the following classes or to have another qualification obtained abroad, which is officially considered equivalent:

ex D.M. 270:

- Class L-2 Biotechnologies
- Class L-13 Biological Sciences
- Class LM-41 Medicine and Surgery

former. D. M. 509/99:

- Class 1 Biotechnology
- Class 12 Biological Sciences
- Class 46S Medicine and Surgery

Previous five-year regulations in Biological Sciences and Biotechnologies.

4.a.b Applicants must have obtained at least 50 ECTS credits that are equally divided between the following scientific-disciplinary sectors:

- BIO / 09 Physiology
- BIO / 10 Biochemistry
- BIO / 11 Molecular biology
- BIO / 13 Applied biology
- BIO / 14 Pharmacology
- BIO / 16 Human Anatomy
- BIO / 17 Histology
- MED / 04 General Pathology
- MED / 07 Microbiology
- CHIM / 03 General chemistry
- CHIM / 06 Organic chemistry

Should applicants lack any of the aforementioned basic curricular requirements, a special commission will indicate to the candidates any additional examinations to be taken before enrolling in the CdS.

4.b Personal academic preparation:

In addition to the evaluation of the curricular requirements, it is foreseen the verification of the personal preparation of the candidates regarding the main disciplines related to medical biotechnologies.

The possession of an appropriate level of English will also be verified (at least B2 level is required).

The verification of the personal preparation of the candidates is carried out by a special Committee of Teachers, with modalities defined by the Degree Course Council and reported in the Regulations of the CdS.

5. Admission procedure

Admission to CLM in Medical Biotechnology is subject to possession of pre-determined curricular requirements and verification of personal preparation.

In case of non-possession of the required curricular prerequisites, a special Committee of Teachers establishes the exams that the graduate must take before enrolling in the CdS.
In addition to the evaluation of students' curricular requirements, the personal preparation of candidates is also assessed. This assessment is carried out in the form of a written test and/or an interview.
A good result in the assessment test will guarantee access to the CdS, after having passed any additional examinations needed to meet the required curricular requirements.

6. Didactic organization
The CLMBM, which lasts two years, is divided into six-month didactic periods and includes theoretical and practical laboratory activities. The courses are both mono-disciplinary and integrated. In the integrated courses, all the Teachers of the courses are part of the Examination Committee.
The lessons of the first year, I semester, begin in November and end in December.
The lessons of the first year, second semester, begin in March and end in May.
The lessons of the second year, I semester, begin in October and end in December.
The lessons of the second year, second semester, begin in March and end in May.
Course attendance is compulsory and is checked according to procedures established by the individual teachers.
In order to be admitted to the exams, the student must have attended not less than 67% of the classroom hours.
The ordinary exam sessions are in: January and February; June and July; September.
Following a request by the students, extraordinary exam dates may be organized during periods of suspension of teaching activities during the Christmas and Easter holidays.
For students who have completed their course attendance, it is possible to organize extraordinary exam dates at any time of the year.
The ECTS credit represents the unit adopted to measure the educational activities of students contained in the Didactic Regulations. The entire two-year course includes 120 ECTS credits.
Each ECTS credit corresponds to 25 hours of student work, including:
• lessons;
• hours of tutorial activity carried out in the laboratories;
• seminars;
• hours spent by students in other training activities foreseen in the degree course programme;
• hours of self-study needed to complete students' training.
The credits corresponding to each course are obtained by students by passing the relevant exams. Finally, 18 ECTS credits are awarded for the preparation of the final dissertation.

7. Official validation of exams or partial exams taken in other Masters programmes
The validation of exams or parts of exams already taken in other university courses is subject to the approval of the Degree Course Council, after consultation with the individual teacher responsible for the course or module in question, and the presentation by the student of a "course abbreviation application", at the time of enrollment, to the student secretarial Office of the medical area (Città Universitaria, Palazzo delle Segreterie, scala A, ground floor).

8. Didactic tutoring
Students are offered educational tutoring, provided by tutors nominated by the Degree Course Council, which aims to support students in their choice of laboratories for the

development of their dissertation, their chosen educational activities from the bioengineering or biomolecular curriculum.

9. Choice of curriculum

Students must choose between the biomolecular curriculum and bioengineering by the end of the first year of the course, by compiling their study path on Infostud. The curriculum and the exam personally selected by the student must be indicated.

10. Activities chosen by the student

The 9 ECTS credits personally chosen by the student can be from one or more courses provided by the University, but are subject to approval by the Degree Course President.
To obtain these 9 ECTS credits, students can choose: a 9 ECTS credit exam; a 12 ECTS credit exam; two 6 ECTS exams; a 6 and a 3 ECTS credit exam.
Apart from the compulsory lessons, students of the Bioengineering curriculum can choose a course of the Biomolecular curriculum and students of the Biomolecular curriculum can choose a course in the Bioengineering curriculum.

11. Internship

The study path of the degree course foresees the acquisition of 3 ECTS credits through an internship and orientation in the first year.
Since attendance of not less than 12 months in a research laboratory is necessary to do an experimental dissertation, students are advised to start their internship for their dissertation already from the first year of the course. In this way, they can do the required number of hours to obtain the 3 ECTS credits in their first year (at least 48 hours) and 18 credits for their dissertation in the second year (at least 800 hours).
Students can do their training internship and the internship for their dissertation in an internal laboratory at a "Sapienza" Department, or at an external research institution.
Students who carry out an internship in a laboratory of Sapienza University must consign to the Didactic Secretarial Office or send by email (at clsbiotecnologie@uniroma1.it) a self-certification regarding the beginning of their internship, using the forms available on the web page of the Degree Programme (section "Traineeships").
Students who carry out a traineeship at an external institution, in order to obtain the insurance coverage provided for the students of "Sapienza", must activate their internship through the Jobsoul platform, according to the procedures described on the web page of the Degree Programme (section "Internships" training ").

12. The final exam

The final exam consists of the discussion, in front of a commission of teachers, of a thesis in the form of an original written dissertation by the student under the guidance of a supervisor.
The dissertation is based on an experimental research project of not less than 12 months in an internal "Sapienza" laboratory or an affiliated external research institution.
The final exam will highlight graduates' abilities in independently carrying out, in coordination with a research group, an experimental research project, together with their ability in describing, presenting and discussing the results of their study clearly.
To take the Final Exam, Students must:
• have followed all the courses and have passed the corresponding exams;
• have obtained a total of 102 ECTS credits in the 2 years of the course;
• have completed their application for their degree according to the procedures and within the deadlines set out by the secretarial offices in question.

The experimental dissertation must be presented by students to the Graduation Commission, made up of 11 members, with the aid of slides. Students have about 10 minutes to present their dissertation and the results of the candidates are announced on the same day at the end of all the thesis presentations.
In addition to supervisor, a co-tutor can be provided if the dissertation has been carried out at a research institution outside "Sapienza". An examiner, appointed by the degree course council, is also foreseen who will analyse the characteristics of the dissertation /final project and evaluate the personal contribution of the candidate in the preparation of the project.
To determine the degree mark, expressed in one hundred and tenths, the following parameters are taken into consideration:
a) the unweighted average of the marks obtained in the curricular exams, expressed as one hundred and tenths;
b) the points awarded by the Degree Commission during the presentation of the dissertation, up to a maximum of 11 points, taking into account the following criteria:
- type of research. The experimental nature of the degree dissertation, which will be judged by the commission, must be originality and/or innovative. The commission will also consider the scientific methodology adopted, which must be based on original scientifically valid evidence.
- quality of the presentation;
- mastery of the topic;
- ability in the presentation;
- duration of the course (in time/ fuori corso);
- number of “praises” obtained in the exams.
Praise can be added to the degree mark with the unanimous consensus of the Commission.