

**ACADEMIC REGULATIONS OF THE  
SIX-YEAR, SINGLE-CYCLE DEGREE PROGRAM IN  
“MEDICINE AND SURGERY” (Class LM-41)  
WITH AN INTEGRATED  
BIOMEDICAL ENGINEERING DEGREE PROGRAM  
(Classes L/8 and L/9)**

**Academic regulations amended by Rector's Decree No. 039/2022**

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MEDTEC School

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### **Art. 1**

#### **Scope of application**

These regulations define the teaching and learning activities and the functioning of the six-year, single-cycle degree program in Medicine and Surgery (Class LM-41) of the MEDTEC School, taught in English, and organized by Humanitas University in partnership with the Politecnico di Milano.

The activities of the MEDTEC School are coordinated with those of the other degree programs organized by the participating Universities.

### **Art. 2**

#### **Pedagogical foundations and definition of learning objectives**

The single-cycle degree program aims to innovate the training program of doctors to sustain them in continuing their professional training throughout their life (*lifelong learning*) and make an active contribution to the scientific, technological, and societal changes which medicine inevitably undergoes over time. To this end, the degree program's general educational purpose is to train doctors able to interpret, anticipate, and promote in a critical and conscious way, the impact of scientific and technological innovation in the field of medicine and of the life sciences, in general.

Specifically, the course aims to train doctors who can take care of their patients by understanding, exploiting, promoting and dealing, in an informed way, with technological innovation in medicine and related sectors, ranging from health promotion to the prevention and treatment of diseases, the rehabilitation of patients and the development of innovative diagnostic and therapeutic solutions.

This degree program features particular characteristics and differs from other programs of the same degree class (LM/41 - Medicine and Surgery) in its specific objective of integrating and enhancing the typical skills of the professional figure of the doctor with basic and typical applied skills of Biomedical Engineering (specific to Degree Classes L/8 and L/9).

The program has a strong focus on acquiring core technical-scientific skills that are further developed in comparison with traditional medical training. This occurs both through a greater emphasis on the specifications of scientific disciplinary sectors common to Classes LM/41, L/8 and L/9 (with reference to the fields of Chemistry, Physics, Mathematics and Statistics, included among such sectors, and the sectors of Industrial Bioengineering, Electronic and Computer Bioengineering and Information Processing Systems present also among the core subjects), and through an integrated program with engineering subjects.

The organization of the study plan is designed to combine the solid preclinical and clinical training required to carry out the medical profession alongside core engineering skills. The link between medical and engineering training unfolds throughout the program with a close collaboration between Humanitas University and the Politecnico di Milano. This partnership aims to fully integrate engineering skills in the preclinical and clinical training course, thanks to co-tutoring by teaching staff of the Politecnico di Milano in some of the professionalizing activities that are part of a doctor's preparation.

Students of the MEDTEC School are offered the opportunity to deepen their engineering skills through the acquisition of 30 additional university credits (CFU), in excess of the 360 credits required to graduate in Medicine. These additional credits are chosen as part of an educational pathway previously approved by the Politecnico di Milano, which, upon completion of the integrated course (360 + 30 CFU), confers, in addition to the Degree in Medicine and Surgery, a Degree in Biomedical Engineering.

In the first 3 years of the MEDTEC School program, the teaching activities of the first semester take place at the Politecnico di Milano and the second semester at Humanitas University. This organization allows students to enjoy a combination of medical and engineering contents (on average at least 0.5 credits in co-attendance per course). Over the following 6 semesters, which are mainly dedicated to clinical training, the teaching and learning activities are organized at Humanitas University in the form of both lectures and professional activities, using the “Mario Luzzatto” Simulation Centre, and other structures of the Humanitas group. In the second three-year period of the course, the interdisciplinary nature of the program is guaranteed by: i) the delivery of at least one engineering course each year; ii) an offer of professional activities in laboratories dedicated to the development of technologies in the biomedical field; iii) an additional program of specialized modules characterizing biomedical engineering within both preclinical and clinical integrated courses, in the co-presence of teachers from both universities; iv) the participation of teachers and tutors of the Politecnico di Milano in some professionalizing activities of a clinical nature, which require the use of specific technologies. To this end, during some professional activities, students are supported by both a clinical and engineering tutor.

In addition to obtaining an additional degree, other innovative aspects compared to “traditional” medical training include:

1. An in-depth level of study of core subjects which are part of a doctor’s training (Chemistry, Physics, Statistics, Computer Science) and part of the preparation of a biomedical engineer.
2. Greater attention to the acquisition of the skills necessary to address issues related to precision medicine and regenerative medicine and the use of high-tech biomedical systems.
3. Integration of preclinical training with related subjects (such as mathematical analysis, electrotechnics, electronics, computer science, mechanics, and so on) necessary to build a solid core engineering training, providing future graduates in Medicine and Surgery with skills that will enable them to tackle complex problems by applying technology and information analysis to medicine.
4. The inclusion in the program of Biomedical Engineering methodologies and technologies in order to promote the acquisition of transdisciplinary skills common to both medical and engineering training.
5. An innovative approach to doctor-patient interaction which allows students to make the most of the potential offered by technologies and intelligent systems to optimize the machine-patient interaction and to personalize therapies and continuity of care.

Degree theses focused on the application of multidisciplinary skills will be encouraged, under the supervision of teaching staff from both universities.

The program involves the use of interactive teaching methodologies (such as Research-Based Learning, Problem-Based Learning, Case Method and a skills portfolio), with the aim of guaranteeing a solid integration between the theoretical concepts learned in the lectures, and the more practical and professionalizing areas necessary to develop an autonomous and critical reasoning capacity.

Particular attention is paid to the process of elaboration and internalization of the relational and ethical aspects of the medical profession, promoting soft skills in communication, critical reading, discussion, public speaking and groupwork. These objectives are achieved through the support of a science tutor or a clinical tutor for small groups of students. The ability to apply knowledge to patients’ needs is developed through basic semiotics labs, ward attendance, and sessions in simulation environments aimed at the acquisition of the main clinical skills during the final 7 semesters of the course. Ward attendance requires an appropriate tutor/student ratio that can ensure effective learning. In this context, the acquisition of basic engineering skills constitutes an additional resource for the training of students of the MEDTEC School degree program, specifically aimed at promoting the understanding and use of the most appropriate technologies. Furthermore, careful attention is paid to identifying gaps in clinical training and available technologies in order to promote critical reflection and facilitate innovation.

Chronologically, the program is organized over 6 years according to the following scheme:

1. The first three-year period is predominantly preclinical. Basic sciences modules will be provided and specific contents of preclinical and core engineering subjects will be taught in-depth;
2. From the fourth year, clinical teaching activities are introduced accompanied/integrated by applications of engineering methodologies to clinical problems and the management of technologies and analyses of data collected from patients. The three-year “clinical” period will also include assessed clinical training required to obtain the licence to practice the medical profession. The assessed clinical training takes place between the fifth and sixth years, if the students have passed the required exams up to the fourth year.

From the first year, the student participates in professionalizing activities, which will increasingly focus on clinical training during the semesters.

The program is completed by a degree thesis, which can also be carried out at affiliated structures (hospitals, research centers, or companies in the biomedical or pharmaceutical sectors).

The primary objective of the educational approach is the acquisition of scientific and technical knowledge and the ability to enter the professional world on completion of the degree program. Furthermore, particular attention is paid to developing a profound sensitivity towards the complex human and social problem of health and disease.

The educational approach is centered on the student and gives value to their active role in the learning pathway encouraging self-learning and small group assignments to help develop critical skills. In short, educational approaches are used to facilitate memorization and interconnection of the various concepts, with their application to professional practice.

Interactive group work and synergistic team work are important steps in the training of students, in addition to readiness to take responsibility, recognize personal limits, and tolerate the stress caused by particularly serious situations.

Particular attention is paid to the awareness that a health intervention is not limited to the therapeutic act, but also and above all considers prevention, rehabilitation, and continuous patient education to monitor their health. An equal focus is placed on acquiring awareness of the role that genetic, environmental and lifestyle factors have on the quality of life and on the onset and development of disease

The MEDTEC graduate, in addition to being able to access the professional opportunities of medicine and biomedical engineering, will be able to respond to the future challenges of medicine and to steer innovation in health technologies also taking up new professional roles.

The education pathway is based on the following criteria:

- a) encouraging integration between the various courses, which are planned thanks to a continuous collaboration and interaction between members of the teaching staff.
- b) All course programs train students to use a methodological approach based on scientific analyses of complex problems and their structure, in addition to in-depth knowledge of different aspects.
- c) As a matter of priority, the specific objectives of the pre-clinical courses will be defined on the basis of the following criteria:
  - relevance of each objective within the framework of human biology;
  - prerequisite of each objective with respect to specific current or foreseeable clinical themes;
  - relevance for the scientific research experiences that students will be required to carry out.

d) As a matter of priority, the specific objectives of the clinical courses are defined on the basis of the following criteria:

- epidemiological prevalence;
- urgency of intervention;
- possibility of intervention;
- severity;
- teaching and learning examples.

Furthermore, the objectives of the clinical courses are defined to give value to:

- attendance of both medical clinics and hospital wards;
- the relationship with the patient, also from a psychological and educational perspective .

e) The importance of core scientific skills to identify innovative and personalized therapeutic solutions, which consider the specific issues of the patient.

f) The teaching approach is inspired by the concept of “active learning” and encourages a problem-based approach. This will allow students to integrate, manage and apply interrelated knowledge and skills, to learn the technique of scientific reasoning applied to medical practice. Students will then be able to master the complexity of the problems by applying interdisciplinary skills and/or interacting with professionals from different backgrounds. Each course includes interactive teaching.

g) In order to foster a thorough training for students, their exposure to clinical experiences is encouraged to help them identify innovative solutions by drawing on their basic skills. Based on different levels of complexity and commitment and within the limits of the structures and resources available, students must attend at least one scientific laboratory for an adequate period of time to gain significant experience; for example, by following the fundamental steps of a scientific experiment.

h) General clinical training is the backbone of the student’s educational pathway, which enables students to acquire the nosographic and pathophysiological basis of diseases and gradually develop a holistic approach to disease from a clinical perspective. Such an approach is aimed at critical reflection and the application of innovative methodologies, especially with clinical case discussions. Trained tutors will support students during their clinical training. Learning from experience is encouraged by adopting educational approaches which facilitate the reflection and empowerment of the student (*briefing and debriefing, individualized learning plans, portfolios, groupwork and lab activities*) and encourages an aptitude for self-learning.

Specialized clinical disciplines provide the nosographic and pathophysiological bases of organ pathology, thus guaranteeing their own synergistic and integrative contribution in the more general clinical phase.

j) In line with a broad professional profile, graduates will be offered traditional training in the hospital environment, along with other training opportunities, such as:

- analysis of social and health situations;
- participation in health planning activities;
- experience of community medicine;
- experience in GP practices;
- attendance of ER department;
- training in understanding the operation and use of technological supports for monitoring and taking care of chronically-ill patients;
- experience of palliative medicine for the terminally-ill patients.

k) In order to encourage the ability to work in a team, the training modules are based on:

- small group work;
- collaboration with other healthcare professionals and biomedical engineers, in order to bring the groupwork practice to life and analyze the communication flows that are established both internally and externally.

- l) The student's elaboration and internalization of the relational and ethical aspects of the profession in a contextual and interactive way is encouraged by real-life situations, where students work with patients and their families, doctors and health workers. In addition to role-playing and self-created cases, this training can also be based on medical humanities through the analyses of films, literature and music.
- m) The organization, functioning and results of the degree program will be constantly monitored by the quality system, involving both students and teachers and resulting in a constant revision and continuous updating of the curriculum. The quality evaluation will take place through feedback tools provided by the University Evaluation Committee.

In order to achieve its educational objectives, the MEDTEC School program provides a core of 360 university credits (CFU), to which are added the 30 Credits of the integrated course in biomedical engineering, for a total of 390 credits divided among the six years of the program, of which at least 60 are dedicated to training activities aimed at developing specific professional skills.

As per the current legislation, the degree program includes no more than 36 exams.

The study plan is shown in Annex 1, which forms an integral part of these regulations. The teaching committee, through the Academic Referents appointed by the two Universities, establishes the objectives of each course and the modality of assessment. The student assessments are scheduled in non-teaching periods. On passing exams, students will acquire the corresponding credits.

### **Art. 3**

#### **Admission to the six-year single-cycle degree program**

- 1. Candidates who have a secondary school diploma or another qualification obtained abroad, recognized as suitable, may be admitted to the degree program in Medicine and Surgery of the MEDTEC school.
- 2. Access to the degree program is programmed at a national level in accordance with Law no. 264 of 2.8.1999. The number of admissible students is defined annually by a Decree of the Ministry of University and Research (MUR), considering the teaching and learning potential declared by the University on the basis of the resources and teaching and clinical facilities available, as well as the needs declared by the Lombardy Region and by the competent Ministry regarding the need for health personnel of the relevant professional profile. The admission test is prepared annually by the University according to the methods and timeframes indicated by the call for admissions, published on the University website, in compliance with current legislation.

### **Art. 4**

#### **University Credits (CFU)**

- 1. The University Credit (CFU) is the unit of measurement of the study workload, including individual study, required of the student for the completion of each teaching and learning activity defined by the academic program to obtain the qualification.
- 2. Each credit corresponds to a 25-hour student workload, of which at least 50% must be individual study, except in cases where the learning activities are of a highly practical or experimental nature.
- 3. Each credit assigned to the various learning activities can correspond to:
  - a) 6 hours dedicated to problem-based learning activities - PBL, the remaining 19 hours to individual study;
  - b) 12 hours dedicated to lectures or equivalent teaching activities; the remaining 13 hours for individual study;



- c) 16 hours dedicated to practical activities or equivalent theoretical-practical activities, the remaining 9 to study and individual re-elaboration;
  - d) 25 hours dedicated to theoretical-practical activities under the guidance of a member of the teaching staff for professionalizing courses;
  - e) 20 hours dedicated to the attendance of assessed clinical training in order to obtain the licence to practice;
  - f) 20 hours of theoretical and practical activities to prepare for the final exam.
4. The credits corresponding to each course are acquired by students in one of the following ways:
- a) passing the relative exam for curricular courses;
  - b) obtaining a pass result by the teaching staff member in charge of the activity for elective and professionalizing activities.
5. The consistency between the credits assigned to the learning activities and the specific learning objectives is ascertained by a Joint Teacher-Student Committee.

#### Art. 5

##### Academic program

1. The academic program of the Degree Program in Medicine and Surgery of the MEDTEC School, taught in English, approved in accordance with current legislation and issued by a Rector's Decree, is an integral part of the HUMANITAS UNIVERSITY academic regulations. These regulations are referred to for the purpose of assigning objectives and credits to individual courses.
2. The list of courses that make up the curriculum to achieve the Degree in Medicine and Surgery of the MEDTEC school, taught in English, the number of credits, and an indication of the scientific-disciplinary sectors that contribute to their development are shown in Table I, which is an integral part of these regulations.

#### Art. 6

##### Teaching and learning methods and activities

The teaching and learning methods used in the academic program consist of:

a) formal teaching

- lectures: these consist in the presentation, by a member of the teaching staff, of contents considered essential for the acquisition of basic knowledge relating to a particular discipline.
- seminars: teaching and learning activities carried out by experts or by course lecturers in which specific topics or research topics are explored, also in a multidisciplinary manner.

b) non-formal teaching:

interactive teaching and learning activities, aimed at group work and coordinated by a tutor, whose task is to facilitate the acquisition of knowledge, skills, and behavioral models.

The non-formal teaching and learning activities include:

- **Problem Based Learning (PBL) and Problem Solving.** This is a learning method based on the analysis of a case/problem freely drawn from concrete experience, which is discussed and analyzed in a small group under the guidance of a tutor. The aim is to develop the knowledge necessary to focus on the proposed problem and search for any missing information to understand/solve it by consulting bibliographic sources (on paper and online) and/or experts. In its advanced version (problem-solving), the goal is to use information to solve the problem.
- **Discussion of clinical case/case studies.** This is a small group discussion of the clinical case of a patient actually encountered in clinical practice. The clinical case may be presented by the students or the tutor. The methodology of the discussion of clinical cases aims to develop analysis and reflection skills starting from situations with the same degree of complexity that the participants will face in their own professional practice.



- **Case method.** This is a learning method based on an ad hoc problem case, which is used to allow students to analyze, understand and explain the situation using all the information in their possession. In planning the module, the case method is usually placed at the end of the teaching module.
- **Concept maps.** The concept map is a learning strategy which, through a graphic construction, allows students to represent the cognitive path with which they build their knowledge around a topic, linking concepts and ideas together.
- **Skill labs.** The skill labs offers a safe, organized environment which aims to ensure the learning of technical medical skills (e.g. semiotic maneuvers for physical examinations through the use of mannequins, or by performing maneuvers among peers) and engineering skills (e.g., experimental lab activities aimed at the creation of a simple prototype software code or a device).
- **Data science labs.** These are activities aimed at understanding the origin of the data/measurements/signals, their pre-processing, statistical processing and analysis, also through the use of machine learning techniques, based on suitably selected datasets.
- **Communication labs. The purposes of these activities are:**
  - **History-taking.** The lab for the acquisition of skills in history-taking makes use of simulated patients who have been trained by means of an ad hoc script to simulate the symptoms related to a pathology and the experience of illness. The lab methodology allows students to try out and learn the techniques and method for taking anamneses.
  - **Briefing and Debriefing.** The *briefing* takes place before the clinical experience and serves to guide the student towards an experience that is suitable for carrying out and circumscribing subjective and objective risks. The *debriefing* is a structured reflection which follows the experiential phase in the field and aims to offer a space for re-elaboration and analysis of the experience from both cognitive and emotional points of view. The reference pedagogical principle of reference is *reflective learning*.
  - **Formative feedback.** Feedback is a structured, formative moment in which students receive an evaluation from a tutor, aimed at defining in detail which aspects relating to their clinical performance need to be consolidated, and how to improve.
  - **Portfolio.** The portfolio is a dossier in which students document the experiences that attest to their learning process. The documents in the portfolio may include feedback, participation in research projects and/or protocols, certificates of attendance at training/refresher courses, etc. The documents in the portfolio are selected by the students themselves, also based on the learning objectives.
  - **Medical humanities.** This introduces the humanities into medical curricula. The Humanities, i.e. literature, cinematography, painting, but also oral or written illness narratives or descriptions of professional experiences, allow students to develop the ability to listen and understand the meaning behind a patient's experience of illness, as well as to reflect on the behavior used in professional practice.

The types of training activities include courses, professionalizing activities, elective activities and teaching and learning activities for the preparation of the final exam.

a) Courses.

1. Integrated courses are held by one or more members of the teaching staff, according to the specific objectives assigned to each course. The teaching staff members who contribute to the realization of each course are identified annually according to procedures specified in the agreement between the two Universities. In the case of integrated courses, a Coordinator is appointed from among the course teachers, designated annually by the teaching committee.
2. The specific objectives of the individual courses are illustrated in the exam program (syllabus).

3. The syllabus is presented annually by the teaching staff already in charge of each course by the start date of enrolment in the new academic year and submitted for approval by the teaching committee, unless there have been no substantial changes to the program already approved.

4. The courses give rise to a single exam, even if organized over several semesters and/or held by several members of the teaching staff.

b) Professionalizing activities.

Students are required to acquire specific skills in the field of internal medicine, general surgery, pediatrics, obstetrics and gynecology, as well as medical-surgical specialties at the facilities identified by the competent academic bodies for a total number of 60 Credits. The professionalizing teaching and learning activity is supervised by one or more tutors and aims at gaining progressive autonomy, simulating future professional practice.

The clinical competence acquired through the professionalizing activities is subjected to evaluation by means of an Objective Structured Clinical Examination (OSCE) and portfolio activities.

The function of the tutor for the performance of professionalizing activities can also be entrusted to non-university personnel with recognized qualifications in the specific training sector, according to the recruitment methods envisaged by the University regulations. (Open Faculty)

The list of professionalizing objectives to be obtained during the study pathway is outlined in a specific document created by the Office for Medical Education, and approved by the teaching committee

Elective activities.

To be admitted to the final exam for graduation, the student must have acquired 8 Credits in the context of freely chosen learning activities (electives).

Elective activities can consist of

- Clinical training (annual, summer and semester based)
- Seminars
- These activities are regulated by a document approved by the competent academic bodies.

d) Learning activities for the preparation of the final exam (thesis).

1. To be admitted to the final exam, the student must have prepared a degree thesis in an original way under the guidance and responsibility of a member of staff of the academic program as supervisor. This activity is defined as a "degree internship". The thesis will consist in the development of a project based on the application of the multidisciplinary medical-engineering skills acquired by the student. The degree commission is made up of professors from both Universities.

During the Covid-19 emergency, the degree program implemented remote teaching methods which avoided interrupting the students' learning pathway, allowing them to fully acquire the knowledge and skills of the courses involved. Given that this need enabled the discovery of interesting new approaches to teaching, this method (*streaming lessons* or *blended mode*) may be applied again in the future to meet any new requirements of the degree program.

2. The student can undertake a degree internship at any department of the University or other affiliated structures. The degree internship can also take place at non-affiliated structures under the responsibility of the supervising member of staff and subject to the authorization of the competent teaching committee.

**Art. 7**

**Assessed clinical training in order to obtain a licence to practice the Medical Profession**

General rules

As required by Art. 3 of the Ministerial Decree of 9 May 2018 no. 58; Art. 102 of Legislative Decree no. 18 of 17 March 2020; Ministerial Decree no. 8 of 2 April 2020; from art. 6, paragraph 2 of Legislative Decree no. 22 of 8 April 2020; Ministerial Decree no.12 of 9 April 2020; and the Rector's Decree no. 68/2020, the assessed clinical training:

- is aimed at ascertaining students' abilities in terms of knowing what to do and knowing how to be a doctor, which consists in applying biomedical and clinical knowledge to medical practice, in solving questions of professional and medical ethics, in demonstrating an aptitude to solve clinical problems pertaining to the areas of medicine and surgery and related specialties, laboratory and instrumental diagnostics and public health, and in applying the principles of effective communication;
- the assessed clinical training placement lasts a total of three months, is completed no earlier than the fifth year of the course, and only if the student has successfully passed all the exams relating to the first four years of the course, as envisaged by the degree program, and organized according to the program and the academic regulations;
- it takes place for the number of hours corresponding to at least 5 credits per month (each credit reserved to the clinical training placement must correspond to at least 20 hours of professionalizing activities and no more than 5 hours of individual study), and is divided into the following periods, even if not consecutive: one month in the surgical area, one month in the medical area, one month in the specific field of general medicine, the latter to be carried out no earlier than the sixth year of the course at the surgery of a General Practitioner. The 15 credits reserved for assessed clinical training activities are part of the 60 Credits dedicated to professionalizing activities;
- the certification of attendance and the evaluation of the clinical training periods are carried out under the direct responsibility of a member of the University's teaching staff or the medical director responsible for the facility attended by the trainee, and by the General Practitioner, who jointly issue a formal certificate of attendance. If the student has demonstrated the required skills, a pass evaluation is registered in a logbook, which is divided into a descriptive part of the activities carried out and an evaluation part of the skills demonstrated;

Students are considered to have passed only in the event of achieving a pass evaluation for each of the three periods.

**Professional skills to be achieved by the end of the clinical training placements**

- A) By the end of the medical and surgical placements, the student must have achieved the following professional skills, in two specific areas:

Implementing best practices of the doctor-patient relationship (interview, report, information, clarity, acquisition of consent)
Possessing the ability to collect a medical history and perform a physical examination in an outpatient setting
Being acquainted with and knowing how to apply clinical reasoning: the ability to identify priority, secondary or urgent problems, and the ability to propose diagnostic hypotheses and identify diagnostic tests with greater sensitivity and specificity to confirm or not confirm hypotheses

Being able to interpret laboratory tests
Being able to interpret imaging reports
Being able to focus on decision-making processes relating to pharmacological and non-pharmacological treatments
Being able to fill in admission/discharge reports of hospitalization and able to fill out the discharge letter
Being able to assess the appropriateness of hospitalization and indicate rehabilitation or protected hospitalization paths at other structures
Being able to explain the reason for hospitalization within the complex of any chronic conditions, other criticalities, and fragility of the patients
Being able to indicate prevention and health education actions
Demonstrating knowledge and awareness of the organization of the National Health Service and of the Regional Health Service
Respecting the start and end times of a shift, dressing appropriately for the role, ensuring the necessary equipment for work
Demonstrating knowledge and awareness of the ward (or consultation room) rules
Interacting correctly with the medical, nursing and technical staff of the ward
Demonstrating knowledge and awareness of the various roles and tasks of team members
Demonstrating a proactive attitude (asking questions, offering to carry out activities)

By the end of the clinical training placement with the General Practitioner, the student must have developed the following professional skills:

Implementing the best practices of the doctor-patient relationship, knowing how to manage reception and structure consultations (interview, report, information, clarity, acquisition of consent)
Possessing the ability to collect a medical history and perform a physical examination in an outpatient and domestic setting
Being acquainted with and knowing how to apply clinical reasoning: able to identify the reasons behind a request for help and the nature and priority of the problem
Being able to assess emergencies and identify the need for hospitalization
Being able to present diagnostic hypotheses and to identify the first level diagnostic tests with greater sensitivity and specificity to confirm hypotheses or not
Being able to interpret laboratory tests
Being able to interpret imaging test reports
Focusing on the decision-making processes relating to the prescription of a correct treatment and on requests for specialist advice
Being able to carry out control activities on the patient's adherence to therapy and plan monitoring and follow-up

Being aware of the problems of the chronic patient with comorbidities in multi-drug therapy
Demonstrating knowledge of the organization of the National and Regional Health Services and of the main bureaucratic and prescriptive rules
Being able to use computerized medical records and be acquainted with the information systems of the National and Regional Health Services
Being able to indicate actions of prevention, health promotion, and correct lifestyles
Respecting the start and end times of a shift, dressing appropriately for the role, ensuring the necessary equipment for work
Demonstrating knowledge and awareness of the rules of organization and operation of a medical clinic
Interacting correctly with the secretarial and nursing staff of the clinic of the General Practitioner
Demonstrating a proactive and collaborative attitude (asking questions, offering to carry out activities)

#### Specific rules

A clinical training placement in the medical or surgical area can also be carried out in more than one Operating Unit within affiliated hospitals. In such a case, each tutor of the various Operating Units will issue a brief evaluation on the candidate, from which the overall evaluation by the coordinator of the medical and/or surgical area will derive. The clinical training with a General Practitioner will take place at the doctor's practice, identified by the relevant Order/Orders of Doctors and Dentists and assigned to students by the Student Office. The general practitioner will express the candidate's overall evaluation.

The assessed clinical training can also be carried out in periods when no lectures are scheduled (generally January, February, June, July, August, and September).

#### Measures for Implementation

Attendance of assessed clinical training begins upon presentation of a specific request, filled in by the student, to be delivered to the Student Office. The student must attach a copy of a valid identity document and self-certification of having passed all exams up to the fourth year of the course. The Student Office will check the authenticity of the declarations contained in the requests, in accordance with current legislation.

The student will be assigned to the medical and surgical departments and the General Practitioner whose clinic the student will attend on the basis of the degree programs of the fifth and sixth year of the course.

The student will be given, in sequence, three logbooks: one for attendance in the medical area, one for attendance in the surgical area, one for attendance at the surgery of a general practitioner affiliated with the Italian National Health Service (SSN).

The student must note the days and times of attendance in the logbook, describing the activities carried out, and include a reflection on what has been done and observed. The logbook will be countersigned by the department tutor and the coordinator. Students will declare that they have received an ongoing assessment from the tutor on the progress of the clinical training placement by signing the appropriate space in the logbook.

The ward tutor will inform students on the outcome of attendance, highlighting, above all, any non-positive feedback, so that they can improve in the subsequent monthly period. The coordinator of the medical or surgical area, identified by the teaching committee of the degree program, after examining the intermediate evaluation of the other tutors,

will formulate a final pass or fail evaluation, communicating the overall evaluation to the student on the monthly clinical training carried out. In the event of a non-pass evaluation, the student will be required to repeat the clinical training and receive a new evaluation for the new month.

The coordinator will keep the logbook containing the student's log, the intermediate evaluation and the final overall evaluation; the coordinator will ensure that this document is sent to the Student Office. After receiving the three logbooks referring to the three areas of the assessed clinical training and having verified that the three-monthly periods have been completed, the Student Office will add them to the student's record.

The teaching committee will annually appoint the tutors who will be tasked with certifying the clinical training placement in the medical and surgical areas. General Practitioners affiliated with the Italian National Health Service (SSN) will be identified in accordance with the Order of Doctors, on the basis of specific agreements stipulated between the Order of Doctors and the University.

The Departments of the Medical Area and the Surgical Area, as well as the General Practitioners to whom the individual students will be assigned, will be indicated directly by the Student Office, based on the availability of the Operating Unit and General Practitioners, who will also be indicated by the Provincial Order of Surgeons and Dentists competent for the area.

#### **Art. 8**

##### **Planning of and procedures for the assignment of teaching hours and activities**

1. As per the Agreement, for the teaching of the courses, each University assigns teaching assignments to its staff, according to its own rules and in line with the planning of the degree program approved by the competent bodies. Annually, the academic referents, having consulted the institutions to which they belong, elaborate a proposal for the allocation of teaching assignments and submit it to the teaching committee to validate and forward to the competent body of the course administration office.

The planning of the degree program includes:

- a) the teaching assignments allocated to the academic staff of the particular course, and any requests to allocate supplementary teaching assignments and contracts to be reserved for hospital and external staff;
- b) a calendar of teaching and learning activities and exam sessions.

#### **Art. 9**

##### **Teaching Committee**

1. Coordination of activities which form part of the international degree program in Medicine and Surgery of the MEDTEC School is assigned to a specific teaching committee. The composition, tasks and operating methods of the committee are defined in these regulations, in compliance with the University regulations

2. As per the Agreement, the Rectors of the two Universities jointly identify the head of the academic program, choosing him/her among the academic referents. The head of the academic program is appointed according to the rules of the University.

The head of the academic program, who represents the degree program institutionally, supervises and coordinates the activities of the teaching committee and convenes it for both ordinary and extraordinary sessions.

3. In accordance with the Rectors, the head may appoint an assistant head, chosen from among the academic referents, who will assist him/her with the relevant roles and duties should he/she be unavailable. The duration of the mandate of the assistant head coincides with that of the mandate of the head of the teaching committee.

4. On a proposal of the head of the academic program, the teaching committee may set up specific commissions of support.



**Art. 10**

**Compulsory Attendance**

1. Students are required to attend the teaching and learning activities included in the study plan. Attendance of the individual courses is verified by the teaching staff by adopting assessment procedures established by the University. Attendance must not be less than 75% of the teaching and learning activities. A certificate of attendance for compulsory teaching activities is necessary for the student to take the relevant exam.

2. At the end of each semester, the Student Office will communicate electronically the names of students, who have not met with the attendance percentage required to register for the exam to the responsible teaching staff member. The latter decides together with other colleagues who teach the course and also on the basis of the number of absences, whether the student can catch up by means of alternative methods, to be defined for each case, and communicated to the student. If the teaching staff member considers that attendance cannot be caught up, he/she will ask the head of the degree program to inform the teaching committee.

If a student does not meet attendance requirements for more than one course, the situation will be directly managed by the head of the degree program who will discuss it with the teaching committee during the first official meeting.

While waiting for the decisions of the teachers and/or the teaching committee, such students cannot enroll for the exams.

The teaching committee may decide that a student, who has not obtained the attendance certificate for each course in a given year, can be enrolled as a repeat student of that year, even if the year is already full, with the obligation to attend the courses for which he/she has not obtained the certificate. If the course runs for more than one semester, the percentage of attendance is applied to the entire course.

3. Students admitted to the first year of the course through the rolling ranking list for the admissions test will have attendance of the courses of the first semester validated until the enrolment date.

4. students may request a total or partial exemption from attendance for serious and documented family or health problems. A request for exemption must be submitted promptly to the Student Office.

5. The teaching committee can request a commission to be specially formed to manage the abovementioned points.

**Art. 11**

**Prerequisites and transition to subsequent years**

1. The passage from one year to the next is allowed only for students who, at the end of the September session, have passed the exams scheduled according to the following table, in compliance with the prerequisites:

<b>To enroll:</b>	<b>It is necessary to have passed:</b>
<b>IV year</b>	All 1 <sup>st</sup> and 2 <sup>nd</sup> year exams

If a student obtains the regular courses attendance certificate as required by the study plan, but presents an exam debt equal to or greater than that indicated in the table above at the end of the September session, he/she will be enrolled as a repeat student for the entire following academic year with no obligation to attend. Students in this category may also take exams outside the scheduled exam periods.

2. In order to ensure a progressive and balanced cultural growth of the student, the following courses must be passed

<b>Exam/s in</b>	<b>Students are required to pass the following exams</b>
Cell Biology, Embryology and Histology	Chemistry and Organic Chemistry
Cell Physiology and Biochemistry I	Chemistry and Organic Chemistry
Bioelectric signal processing and modeling	Mathematics
Biomedical Electronics and instrumentation	Basics of Circuit theory
Physiology, Anatomy and Biochemistry II	Fundamentals of Experimental Physics Cell Biology, Embryology and Histology Regional anatomy and gross neuroanatomy Cell Physiology and Biochemistry I
Molecular and Computational Biology and Medical Genetics	Cell Biology, Embryology and Histology
Biomechanics and Thermodynamics	Fundamentals of Experimental Physics
Biocompatibility and Biomaterials	Chemistry and Organic Chemistry
Pathology, Immunology and Microbiology	Physiology, Anatomy and Biochemistry II
Organ System Diseases I – II - III	Pathology, Immunology and Microbiology
Molecular Oncology	Pathology, Immunology and Microbiology
Doctor - Patient Communication	Professionalism, Bioethics and History of Medicine
Pediatrics, Obstetrics and Gynecology	Organ System Diseases I – II – III Dermatology, Clinical immunology and infectious diseases
Patient Management	Organ System Diseases I – II – III Molecular Oncology Pharmacology Clinical Neurosciences and Mental Health Advanced Imaging and Diagnostics Head and Neck Diseases Dermatology, Clinical immunology and infectious diseases Bone and joint and Technologies in Rehabilitation

**Art. 12**  
**Assessment of learning**

1. In compliance with current legislation and the academic program of the degree program, the total number of examinations cannot exceed that of official courses and cannot in any case be greater than 36 in the six years of the program.

2. To take exams and other tests to verify learning, the student must be up to date with the payment of fees and contributions, must have passed the preparatory exams, and be in possession of all the certificates of attendance. It is not permitted to repeat an exam that has already been passed, even in the case of learning activities validated by a previous academic career.

Violation of the contents of point 2 will result in the cancellation of the exams with a Rector's Decree.

3. The dates of the exams are fixed at least 60 days prior to the exam date. These dates must be communicated to the competent departments so that they can be disseminated through the channels available to allow the enrollment of students. In order to allow students to take full advantage of the exam session, any overlapping of dates between exams of the same course year is avoided.

4. Assessment of learning can take place in the following ways:

- continuous assessment tests: these are exclusively intended to detect the effectiveness of the learning and teaching processes in relation to specific contents. When implemented, there is no registered mark, they are not mandatory, and are scheduled for the purpose of self-assessment of individual preparation and monitoring of the progress of the course by the teaching staff;

- optional tests: such tests are optional and carried out during the examination period, but not registered. These tests verify the preparation of the program carried out at the end of one or more semesters in the courses lasting one year or longer; the result is noted in a special register and – if passed – a new assessment in the final examination is not required. However, the student must demonstrate knowledge of the topics of the optional test by referring to them during any relevant exam. The test is considered valid until the end of the academic year in which it was taken;

- end of course exams: these are aimed at assessing the achievement of course objectives and the degree of individual preparation of the students and therefore have a registered mark. Coherence between the exams and the learning objectives of the course, and between the exam modality, and the teaching methodologies will be guaranteed.

Cognitive learning objectives will be assessed through written and oral exams.

Clinical and relational skills will be assessed through OSCE (Objective Structure Clinical Examination), and portfolio activities.

5. For students within the prescribed study timeframe, the end of course exams take place after the conclusion of the relative courses in periods defined annually by the teaching committee.

6. For students who are repeating or are outside the prescribed study timeframe, exam sessions can also be set during the periods reserved for teaching and learning activities.

7. Students who have not passed an exam can return to a subsequent exam date, even in the same session, as long as at least two weeks have elapsed from the failed test.

8. To pass an exam, it is necessary to achieve a minimum score of 18. Any attribution of *cum laude* or a special mention, in addition to the maximum score of 30, is subject to a unanimous evaluation by the exam commission.

9. The exam commissions are appointed by the department director, on the nomination of the head of the teaching committee. The exam commissions are made up of at least two teaching staff members.

The methods for verifying the achievement of the expected learning outcomes, defined in accordance with the 5 Dublin descriptors, are summarized below:

Verification method	Description	Expected learning outcome
		Dublin Descriptors: 1- Knowledge and understanding; 2- Applying knowledge and understanding; 3- Making judgments; 4- Communication skills; 5- Learning skills
Written test	<ul style="list-style-type: none"> <li>multiple choice theoretical questions on the topics of the course</li> <li>open-ended theoretical questions on the topics of the course</li> </ul>	<ul style="list-style-type: none"> <li>1</li> <li>1; 4</li> </ul>
Oral test	<ul style="list-style-type: none"> <li>multiple choice theoretical questions on the topics of the course</li> <li>questions aimed at highlighting the student's ability to develop links between the various topics of the course and with previous courses</li> </ul>	<ul style="list-style-type: none"> <li>1; 4</li> <li>2; 3; 4</li> </ul>
Evaluation of project reports carried out	<ul style="list-style-type: none"> <li>evaluation (group or individual) of the prepared reports and interactions within the groups</li> </ul>	<ul style="list-style-type: none"> <li>2; 3; 4; 5</li> </ul>
Evaluation of laboratory activities	<ul style="list-style-type: none"> <li>evaluation (group or individual) of the activities developed in the laboratory</li> </ul>	<ul style="list-style-type: none"> <li>2; 3; 4</li> </ul>
Oral discussion of the results of individual or small group professionalizing activities	<ul style="list-style-type: none"> <li>presentation (group or individual) of the activities carried out during the hours dedicated to professionalizing activities (pre-clinical or clinical)</li> </ul>	<ul style="list-style-type: none"> <li>1; 2; 4; 5</li> </ul>
OSCE (Objective Structured Clinical Examination)	<ul style="list-style-type: none"> <li>evaluation of the clinical skills acquired thanks to professionalizing training activities.</li> </ul>	<ul style="list-style-type: none"> <li>2; 3; 4; 5</li> </ul>
Final assessment	<ul style="list-style-type: none"> <li>presentation and discussion of the thesis activity carried out independently by the student, also of a design nature.</li> </ul>	<ul style="list-style-type: none"> <li>2; 3; 4; 5</li> </ul>

During the Covid-19 emergency, the degree program bodies adopted specific guidelines approved by the Department Council on 27 April 2020 for conducting remote exams. These methods may be applied again in the future to meet any new requirements of the degree program.

### Art. 13

#### Final examination for graduation

1. The final exam focuses on the discussion of a thesis prepared in an original way by the student under the guidance of a supervisor and co-managed by members of the teaching staff from both Universities according to procedures, timeframes and rules defined by the teaching committee; one or more co-supervisors may participate. The degree commission is made up of professors from both universities.

2. Eligibility to take the final exam is subject to successful completion of all the exams required by the study plan. 8 Credits can be acquired by passing the final exam.

3. The final degree average is weighted. The calculation is based on the credits acquired with the exams bearing a numerical mark, using the following formula:

average out of 30: sum of the marks multiplied by the respective credits

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sum of credits envisaged for the exams that contribute to the average

average over 110: the weighted average over 30 x 110

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30

4. The final mark, expressed in one hundred and tenths, is determined by:

- a) grade at graduation session (average out of 110)
- b) the mark assigned by the degree commission.

5. Following a discussion among the members of the commission, each candidate will be assigned a mark to be added to the average presentation grade. The maximum score that can be attributed by the degree commission is 10 points of which:

A maximum of seven points are given, according to the type of thesis.

Research thesis (max 7 points, however 1 extra point can be allocated for thesis of a transdisciplinary medical-engineering nature).

Compilation thesis (max 2 points)

A maximum of three points are given, according to the following criteria:

1 point if the final exam is completed by the end of Year 6 (this includes the March degree session of the following year)

1 point if there are five or more cum laude in the list of exams taken.

2 points if an 'excellent' evaluation has been obtained at the end of the professionalizing activities, and 1 point for a 'very good' evaluation.

6. The possible attribution of *cum laude* or a special mention in addition to the maximum score of 110 is allowed only for those candidates whose average grade is at least 102 and can reach a total of 112 on summing up the abovementioned points.

7. Candidates with an average of at least 105 or more and who reach a total of 115 on summing up the abovementioned points will obtain a distinction alongside cum laude.

#### Art. 14

#### Guidance, tutoring, and support for students

1. Tutoring is a support activity for students who may encounter difficulties during their study pathway. The tutoring service is available for all students enrolled on the one-cycle degree program in Medicine and Surgery, MEDTEC School.

Tutoring is aimed at:

a) supporting students in organizing their study program (choice of exam sessions, information on preparatory courses, information and clarifications on exam programs);

- b) supporting students with difficulties in preparing for particular exams (advice on study methods, contact with teaching staff who can be of help and suggest useful resources for study);
- c) guiding students in choosing their degree thesis topic;
- d) directing students to the counselling service;

2. 1<sup>st</sup> and 2<sup>nd</sup> level professors and researchers, appointed by the teaching committee, carry out tutoring activities. The teaching committee nominates no more than 2 teaching tutors for each year of the degree program. During the clinical training years, tutoring activities are also held by the Office for Medical Education. Academic staff members who hold the office of Rector, Vice-Rector, Department Director, Head of the teaching committee, member of the Academic Senate and of the University's Board of Directors may be exempted from tutoring.

#### **Art. 15**

##### **Periods of study and/or training placements abroad**

1. The teaching committee of the degree program encourages students to acquire experience abroad. To this end, it promotes the signing of agreements with foreign universities, in collaboration with the department and the University.
2. Students who take advantage of EU mobility programs are allowed to attend courses abroad for up to a maximum of two semesters, starting from their second year.
3. In accordance with current procedures, students wishing to take advantage of this opportunity must submit a request to the appropriate commission of the degree program indicating the study plan they intend to carry out at the foreign university (*learning agreement*). For the purposes of accepting requests, the procedures and criteria established at University and department levels apply.
4. The learning activities carried out abroad within the framework of student mobility programs of the European Union and the related credits are fully or partially recognized for the purpose of obtaining the degree in accordance with the provisions of the European Credit Transfer System (ECTS). The conversion to thirtieths of the marks obtained in exams taken abroad is carried out according to the following table:

ITALY	18	19	20	21	22	23	24	25	26	27	28	29	30	Cum laude
Austria	4				3			2			1			-
Belgium	10	11			12		13	14		15	16	17		18-20
Denmark	6	7		8	9			10		11	12		13	
Estonia	E/1	D/2			C/3			B/4			A/5			-
Finland	0.75	0.92	1.08	1.25	1.42	1.58	1.75	1.92	2.08	2.25	2.42	2.58	2.75	3
France	10	11			12		13		14		15		16-20	
Germany	4.9	4.7- 4.8	4.4- 4.6	4.1- 4.3	4- 4+	3.6- 3.9	3.1- 3.5	3- 3+	2.6- 2.9	2.1- 2.5	2- 2+	1.6- 1.9	1.1- 1.5	1-1+
Greece	5	6		7			8			9			9.5	10
Ireland	40	42	44	46	48	50	52	55	58	61	64	687	70	71-100
Iceland	5				6			7			8		9	10
Norway	4	3.75		3.5			3.25			2.5		2	1.5	1
The Netherlands	5.5	6		6.5		7		7.5		8		8.5	9	10
Poland	3-3	3+/3.5			4			4+/4.5			5			-
Portugal	10	11		12	13	14	15	16	17	18		19	20	
UK (cents)	40	42	44	46	48	50	52	55	58	61	64	67	70	71-100
UK (sixteenths)	4	5		6		7	8	9	10	11	12	13	14	15-16
Romania	5	6			7			8			9			10
Slovenia	6	7			8			9			10			-
Spain	5	5.1- 5.5	5.6- 6	6.1- 6.3	6.4- 6.5	6.6- 6.7	6.8- 6.9	7	7.1- 7.5	7.6- 8	8.1- 8.5	8.6- 9.5	9.6- 10	10+
Spain (judgments)	Aprobado o Suficiente							Notable			Sobresaliente		Matricula de Honor	
Sweden	G (Odkaend)+	G (Odkaend)+			G (Odkaend) ++			Val G (Odkaend)		Val G (Odkaend)+			-	
Switzerland	4				4.5				5		5.5		6	
Hungary	2	3			4			4.5		5			-	
U.S.A.	D-	D	D+	C-	C	C+	B-	B	B+	A-	A		A+	
ECTS grade system	E	D			C			B		A			-	
ECTS (judgments)	Sufficient						Satisfactory			Good		Very Good		Excellent
<b>ITALY</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>	<b>Cum laude</b>

5. Students can apply for recognition of a period abroad as an elective activity, prior to approval of the head of the teaching committee.

6. During the periods abroad, duly authorized pursuant to this Article, students are exempted from obligatory attendance of the teaching and learning activities of the degree program.

#### Art. 16

#### Repeat students and students outside the prescribed course timeframe



1. According to the provisions of Article 10 of these regulations, students who have not passed their exams, explicitly required for the transition to the next year of the course, or complied with the obligations to attend courses, will be enrolled as repeat students. Enrollment as a repeat student lasts for the entire academic year and will be modified from the academic year when their position is regularized.
2. Students outside the prescribed course timeframe are those who have obtained all the relative certificates of attendance, but have not obtained a qualification within the prescribed course timeframe.

#### **Art. 17**

##### **Loss of student status**

1. Students who fail to pass exams for eight consecutive academic years or who interrupt or suspend their studies for a period of more than eight academic years, lose their student status. Students who have lost their student status can enroll again on the degree program after re-sitting the admission test. The teaching committee proceeds, at the request of the interested party, to the recognition of credits acquired in their previous academic career after verifying their non-obsolescence.

#### **Art. 18**

##### **Validity of former study credits**

1. The credits obtained by passing exams are subjected to a verification of non-obsolescence after five years or less from their acquisition, based on the course and the change in its contents.
2. Students who undergo the verification of the credits referred to in point 1 are sent a written communication by the Student Office indicating the methods and timing of such verification.

#### **Art. 19**

##### **Recognition of studies completed on other degree programs**

1. Studies completed on other degree programs of Humanitas University or other universities, and the credits obtained, are recognized by the teaching committee, which may make use of a special commission, after examination of the previous curriculum. In the validation proposal, if the criteria established for the transition to subsequent years are respected pursuant to Art. 10 of these regulations, the commission indicates in addition to the validated exams also the year of the course which the student may be admitted to.

#### **Art. 20**

##### **Governance of the academic program and the quality assurance process of teaching and learning**

1. In relation to the governance of the degree program, the agreement made between Humanitas University and the Politecnico di Milano includes the setting up of a Steering Committee composed of at least five members, including the Rectors of the participating universities, or their delegates, and from three to seven prominent representatives of the social, cultural, economic and entrepreneurial structure chosen from a shortlist of at least ten names proposed by the universities to whom to entrust the function of monitoring and guiding correct implementation of the training project of the integrated course. The Steering Committee will appoint its Head from among the extra-academic representatives.
2. In addition, the participating universities have identified four “academic referents”, two for each University, from among the academic staff who collaborated in defining the training project and/or who are part of the teaching committee, and entrusted with the function of supervising the management and development of the academic program, and in particular:
  - interact and collaborate with members of the quality assurance systems of the two universities;

- verify implementation of the agreement signed by Humanitas and the Politecnico di Milano to set up the integrated course, and compliance with its provisions;
- evaluate and propose any changes to the agreement to the respective universities;
- report annually to the Steering Committee and the Governing Bodies of each University on the progress of the project.

The “Head of the Academic Program” will be chosen from among the Academic Referents and be appointed according to the rules of the administrative office (i.e. Humanitas University). The Head, in agreement with the Rectors, appoints an assistant head, choosing him/her from among the academic referents.

3. The involvement of external interlocutors, who are also able to suggest and/or support any actions for improvement and update teaching topics, is ensured by the presence of the Steering Committee to which the academic referents shall report at least once a year.

4. The main processes and procedures of the quality assurance system in which the academic program’s bodies are involved are:

- 1) Design of a new degree program and review and monitoring of an existing degree program
- 2) Completion of the Annual Document (SUA)- degree program
- 3) Process of self-evaluation and evaluation of the degree program

- Use and dissemination of annual questionnaires
- Use and dissemination of the annual review report
- Joint teacher-student committee activities, including the use and dissemination of the annual report
- 4) Syllabus compilation process and its publishing

As part of the quality assurance process, for each academic program a review group is appointed within the teaching committee, which is responsible for drafting the annual monitoring form and the annual review report. The annual monitoring form consists of a brief critical comment on the quantitative indicators, calculated by National Agency for the Evaluation of the University System and Research (ANVUR), concerning student careers, attractiveness and internationalization, graduate employment rate, quantity and quality of teaching staff and graduate satisfaction.

The annual review report (conducted at least every five years) contains an in-depth self-evaluation of the academic program overall performance, based on all the relevant elements of analysis. In this report the academic program bodies identify and analyze the most relevant problems and challenges, also proposing solutions to be implemented in the following review cycle. The review group chaired by the head or the coordinator of the academic program bodies are responsible for the design, management and continuous improvement of the degree program. They act under the control of the University QA system, annually defining the objectives, actions to be taken, and the verification of the results achieved. Each review group includes a student representative. The quality assurance process of the degree program’s teaching and learning activities is described in the university quality assurance document.

## **Art. 21** **Teacher development**

As the teaching staff need to constantly update their pedagogical training, the teaching committee of the degree program promotes training activities and encourages any personal initiatives of individual teaching staff.

A system of continuous teacher training of teaching staff and tutors will be promoted, and opportunities for reflection and study will be organized, which will focus in particular on the following topics:

- ◇ planning of teaching and learning contents in relation to the learning objectives;
- ◇ interactive teaching methods designed to support experiential learning;
- ◇ evaluation tools.

TABLE I

Anno di corso	Periodo erogazione	Titolo Corso/Corso integrato	Tot. CFU	SSD MODULI	CFU SSD/moduli	Tipo esame (C=compulsory; O=optional)
I	I sem	Fundamentals of Experimental Physics	10	FIS/01 Fundamentals of Experimental Physics	10	C
	I sem	Chemistry and Organic Chemistry	6	CHIM/07 Chemistry and Organic Chemistry	6	C
	I sem	Mathematics	10	MAT/05 Mathematical analysis	7	C
				MAT/03 Geometry	3	C
	Annuale	Cell Biology, Embriology and Histology	11	BIO/13 Experimental biology	5	C
				BIO/17 Histology	4	C
				BIO/16 Human anatomy	2	C
	II sem	Regional anatomy and gross neuroanatomy	8	BIO/16 Human anatomy	8	C
	II sem	Cell Physiology and Biochemistry I	7	BIO/10 Biochemistry	5	C
				BIO/09 Physiology	2	C
	II sem	Professionalism, Bioethics and History of Medicine	4	M-PED/01 Theories and science of education and social education	2	C
M-FIL/02 Logic and Philosophy of Science				1	C	
MED/02 Medical history				1	C	

	II sem	Professionalizing activities 1st year	1		1	C
II	I sem	Statistics	6	SECS-S/01 Statistics	4	C
				SECS-S/02 Statistics for experimental and technological research	2	C
	I sem	Automation and Mechatronics	6	ING-IND/13 Applied mechanics	3	C
				ING-INF/04 Systems and control engineering	3	C
	I sem	Computer science	5	ING-INF/05 Information processing systems	5	C
	I sem	Basics of Circuit theory	5	ING-IND/31 Basics of Circuit theory	5	C
	Annuale	Physiology, Anatomy and Biochemistry II	25	BIO/09 Physiology	14	C
				BIO/16 Human anatomy	6	C
				BIO/10 Biochemistry	5	C
	II sem	Bioelectric signal processing and modeling	4	ING-INF/06 Electronic and informatics bioengineering	4	C
	II sem	Molecular and Computational Biology and Medical Genetics	9	MED/03 Medical genetics	4	C
				BIO/11 Molecular Biology	3	C
ING-INF/05 Information processing systems				1	O	
ING-INF/06 Electronic and informatics bioengineering				1	C	
II sem	Professionalizing activities 2nd year	1		1	C	

III	I sem	Biomedical Electronics and instrumentation	10	ING-INF/06 Electronic and informatics bioengineering	7	C
				ING-INF/01 Electronics	1	O
				FIS/07 Applied physics	1	C
				MED/36 Diagnostic imaging and radiotherapy	1	C
	I sem	Biomechanics and Thermodynamics	11	ING-IND/34 Industrial bioengineering	8	C
				ING-IND/10 Thermal engineering and industrial energy systems	3	O
	I sem	Biocompatibility and Biomaterials	5	ING-IND/34 Industrial bioengineering	5	C
	Annuale	Pathology, Immunology and Microbiology	19	MED/04 Experimental medicine and pathophysiology	10	C
				MED/07 Microbiology and clinical microbiology	5	C
				MED/08 Pathology	4	C
II sem	Doctor - Patient Communication	3	M-PSI/08 Clinical psychology	2	C	
			M-PSI/01 General psychology	1	C	
II sem	Professionalizing activities 3rd year	9			C	
IV	I sem	Organ System Diseases I: Blood, Heart and Lung	10	MED/11 Cardiovascular diseases	2	C
	I sem	Organ System Diseases I: Blood, Heart and Lung		MED/11 Cardiovascular diseases	2	C

	I sem	Organ System Diseases I: Blood, Heart and Lung		MED/10 Respiratory diseases	3	C
	I sem	Organ System Diseases I: Blood, Heart and Lung		MED/15 Blood diseases	2	C
	I sem	Organ System Diseases I: Blood, Heart and Lung		MED/18 General surgery	1	C
	I sem	Organ System Diseases II: Kidney and Genito-urinary system	5	MED/14 Nephrology	3	C
	I sem	Organ System Diseases II: Kidney and Genito-urinary system		MED/18 General surgery	1	C
	I sem	Organ System Diseases II: Kidney and Genito-urinary system		MED/24 Urology	1	C
	Annuale	Public health	5	MED/42 Public health	2	C
	Annuale	Public health		MED/42 Public health	1	C
	Annuale	Public health		MED/44 Occupational medicine	2	C
	I sem	Healthcare Management	5	ING-IND/35 Healthcare Management	5	O
	Annuale	Pharmacology	8	BIO/14 Pharmacology	8	C
	II sem	Machine learning and Artificial Intelligence	5	ING-INF/05 Information processing systems	5	C
	II sem	Organ System Diseases III: Endocrine and Gastrointestinal systems, Nutrition and Metabolism	11	MED/12 Gastroenterology	4	C



	II sem	Organ System Diseases III: Endocrine and Gastrointestinal systems, Nutrition and Metabolism		MED/13 Endocrinology	2	C
	II sem	Organ System Diseases III: Endocrine and Gastrointestinal systems, Nutrition and Metabolism		MED/13 Endocrinology	1	C
	II sem	Organ System Diseases III: Endocrine and Gastrointestinal systems, Nutrition and Metabolism		MED/18 General surgery	2	C
	II sem	Organ System Diseases III: Endocrine and Gastrointestinal systems, Nutrition and Metabolism		MED/18 General surgery	2	C
	II sem	Doctor - Patient Communication	1	M-PSI/08 Clinical psychology	1	C
	II sem	Patient specific modeling and technologies for artificial organs	6	ING-IND/34 Industrial bioengineering	6	O
	Annuale	Professionalizing activities 4th year	14		14	C
V	I sem	Molecular Oncology	8	MED/08 Pathology	1	C
	I sem	Molecular Oncology		MED/08 Pathology	2	C
	I sem	Molecular Oncology		MED/06 Medical oncology	2	C
	I sem	Molecular Oncology		MED/15 Blood diseases	2	C
	I sem	Molecular Oncology		MED/05 Clinical pathology	1	C
	I sem	Clinical Neurosciences and Mental Health	9	MED/26 Neurology	4	C
	I sem	Clinical Neurosciences and Mental Health		MED/37 Neuroradiology	1	C

I sem	Clinical Neurosciences and Mental Health		MED/25 Psychiatry	3	C
I sem	Clinical Neurosciences and Mental Health		MED/27 Neurosurgery	1	C
I sem	Advanced Imaging and Diagnostics	9	MED/36 Diagnostic imaging and radiotherapy	4	C
I sem	Advanced Imaging and Diagnostics		MED/03 Medical genetics	1	C
I sem	Advanced Imaging and Diagnostics		MED/08 Pathology	1	C
I sem	Advanced Imaging and Diagnostics		ING-INF/06 Electronic and informatics bioengineering	3	O
I sem	Doctor - Patient Communication		1	M-PSI/08 Clinical psychology	1
II sem	Head and Neck Diseases	5	MED/28 Oral diseases and dentistry	1	C
II sem	Head and Neck Diseases		MED/30 Eye diseases	2	C
II sem	Head and Neck Diseases		MED/31 Otorhinolaryngology	2	C
II sem	Dermatology, Clinical immunology and infectious diseases	7	MED/17 Infectious diseases	3	C
II sem	Dermatology, Clinical immunology and infectious diseases		MED/35 Dermatological and venerological diseases	2	C
II sem	Dermatology, Clinical immunology and infectious diseases		MED/16 Rheumatology	2	C
II sem	Bone and joint and Technologies in Rehabilitation	11	MED/33 Musculoskeletal system diseases	3	C
II sem	Bone and joint and Technologies in Rehabilitation		MED/34 Physical and rehabilitation medicine	1	C
II sem	Bone and joint and Technologies in Rehabilitation		MED/36 Diagnostic imaging and radiotherapy	1	C
II sem	Bone and joint and Technologies in Rehabilitation		MED/48 Neuropsychiatric and rehabilitation nursing sciences	1	C

	II sem	Bone and joint and Technologies in Rehabilitation		ING-IND/34 Industrial bioengineering	1	O
	II sem	Bone and joint and Technologies in Rehabilitation		ING-INF/06 Electronic and informatics bioengineering	4	O
	Annuale	Professionalizing activities 5th year		20	Professionalizing Activities	10
			<i>Tirocinio pratico-valutativo</i>	10	C	
VI	I sem	Patient Management	18	MED/09 Internal medicine	9	C
	I sem	Patient Management		MED/18 General surgery	4	C
	I sem	Patient Management		MED/06 Medical oncology	1	C
	I sem	Patient Management		MED/22 Vascular surgery	1	C
	I sem	Patient Management		M-PSI/08 Clinical psychology	2	C
	I sem	Patient Management		MED/45 Nursing sciences: general, clinical and paediatric	1	C
	I sem	Pediatrics, Ostetrics and Gynecology	6	MED/38 General and subspecialty paediatrics	3	C
	I sem	Pediatrics, Ostetrics and Gynecology		MED/40 Obstetrics and gynaecology	3	C
	II sem	Healthcare Robotics and active ageing	10	MED/09 Internal medicine	2	C
	II sem	Healthcare Robotics and active ageing		MED/09 Internal medicine	1	C
	II sem	Healthcare Robotics and active ageing		ING-INF/06 Electronic and informatics bioengineering	3	C
	II sem	Healthcare Robotics and active ageing		ING-INF/06 Electronic and informatics bioengineering	1	O
	II sem	Healthcare Robotics and active ageing		ING-IND/13 Applied mechanics	3	O
	II sem	Emergency and Life support	7	MED/41 Anaesthesiology	2	C
	II sem	Emergency and Life support		MED/09 Internal medicine	2	C

	II sem	Emergency and Life support		MED/18 General surgery	1	C
	II sem	Emergency and Life support		ING-IND/34 Industrial bioengineering	1	O
	II sem	Emergency and Life support		ING-INF/06 Electronic and informatics bioengineering	1	O
	II sem	Legal Medicine and Bioethics	3	MED/43 Forensic medicine	3	C
	Annuale	Professionalizing activities 6th year	15	Professionalizing Activities	10	C
	Annuale			<i>Tirocinio pratico-valutativo</i>	5	C
I-VI		Elective courses	8			C
VI		Final exam	8			C