

Degree Programme

Graduates of the Degree Programme in Cardiocirculatory and Cardiovascular Perfusion Techniques are health workers responsible for the management and maintenance of equipment relating to extracorporeal circulation and haemodynamic techniques. Their duties are exclusively of a technical nature. Under a doctor's guidance, they assist the medical staff by providing essential information and using equipment to obtain haemodynamic diagnosis or cardiocirculatory functional support. Graduates of cardiocirculatory and cardiovascular perfusion techniques plan, manage, and evaluate what is necessary for the proper functioning of the equipment and guarantee the correct application of the required support techniques. They may practice in public or private health facilities as employees or self-employed professionals. They contribute to the training of support staff and to their lifelong learning in respect to their professional profile and research.

Academic Regulations

ACADEMIC REGULATIONS OF DEGREE PROGRAMMES IN THE HEALTH PROFESSIONS (Ministerial Decree 270/04)

The Faculties of Pharmacy and Medicine and of Medicine and Dentistry contribute to the establishment of degree programmes in the health professions. The degree programmes in the health professions are divided into two levels. The first level lasts three years and leads to a Bachelors Degree (L/SNT1, L/SNT2, L/SNT3, L/SNT4); the second, lasting two years, leads to a Masters Degree (LM/SNT1, LM/SNT2, LM/SNT3, LM/SNT4). The Faculty to which the degree programme belongs determines the institution and activation of the degree programme, as well as the accreditation of the structures necessary for the professional internship.

Art. 1 Educational Organisation

The educational activities are aimed at achieving a complete professional training through the acquisition of theoretical and practical knowledge. Professional training activities are also carried out through technical-practical internships, in compliance with European Union regulations. To achieve the training objectives, the Faculty may use structures, both in Italy and abroad, which are legally suitable. The educational activities used to achieve the specific training objectives include lectures, conferences, seminars, work groups, and discussions. To allow the acquisition of the skills necessary for the practice of the profession, the Degree Programme Council determines the professional training activities to be carried out (internships, laboratory activities, and guided clinical studies). The Faculty may make use of health / hospital / IRCCS or other national health system structures as well as accredited private institutions that comply with legal requirements.

Professional training activities must only take place through forms of teaching in small groups under the guidance of a specifically trained tutor, and which allow a large degree of student autonomy. These professional activities aim to give students the professional, relational, and behavioural skills necessary to achieve professional, decision-making, and operational autonomy in the professional setting.

The Faculty Board defines the academic system in compliance with all applicable laws and regulations. If it is necessary to make changes to the teaching method (content, name, number of courses, or number of exams), the Faculty Committee will discuss and approve the proposed changes.

The president, responsible for all the educational and training activities, and the academic director, coordinator of the technical-practical activities, are the reference figures for the degree programme.

Art. 2 Admissions

Candidates with a secondary school diploma or other qualification obtained abroad which is recognised as equivalent under current legislation and who have reached a high enough position on the admissions list can be admitted to the degree programmes of the health professions. The maximum number of students enrolled in each degree programme is established by the competent authorities in relation to the resources available. The programmed number of applicants to the first year of studies is defined in accordance with art. 3, paragraph 2 of Law 264 of 2 September 1999 (Rules on access to university courses).

Transfers from another university after the first year within the same class/typology of degree programme are permitted without repeating the entrance exam by presenting documentation related to the university career and academic system to the president of the degree programme in which the student wishes to enroll. The president, after verifying the congruity of the academic system and the exams taken, as well as the availability of vacant posts after the first year of the programme, grants permission for the transfer. The student must then forward the transfer request and the clearance from the president to the university of origin. The university of origin will then forward the transfer documentation to the Student Affairs Office. Transfers from the same degree programme in years subsequent to the first are allowed upon approval from the president of the degree programme of origin as well as from the president of the degree programme of the chosen location.

The transition from one degree programme to another is possible only after passing the entrance exam to the new degree programme. It is forbidden to be enrolled simultaneously at different universities or in different faculties or degree programmes at the same university.

Art. 3 Credits

The degree programme has a duration of three years. The unit of measure for the work required of the student for every educational activity is the credit. As established by law, every credit corresponds to 30 hours of work per student for class 1, and 25 hours of work/student, for classes 2, 3, and 4. The average amount of work done in one year by a full-time student amounts to 60 credits.

Of particular importance to the professional training are the practical training and clinical internship activities, to which 60 credits are dedicated over the course of three years. These are completed under the guidance of tutors belonging to the specific professional profile and coordinated by a teacher belonging to the highest level of training required for the professional profile. These activities, as well as their total number of hours, are adapted to the educational standard defined by European Union legislation.

Credits are awarded upon the successful passing of the final exam of each course. The exams are organized as integrated tests for multiple coordinated modules. Learning is evaluated through oral and written exams at the end of the course, as well as self-evaluation or progress tests in the middle of the course. With regard to written tests, the modalities used can be: 1) multiple choice or short answer tests on interdisciplinary issues, followed by an exam to ascertain the skills acquired; or 2) written essays on assigned topics or on the analysis of the laboratory or professional activities undertaken for the final exam.

The academic system of the degree programme define, in compliance with the regulatory limits, that the percentage of the total number of hours available to the student for personal study or for

other individual training activities is no fewer than at least 50% of the hours assigned for each credit. Italian regulations also mandate the completion of the following educational activities and their assigned credits: 6 credits for electives, 9 credits for the final exam and for English language acquisition, 1 credit for information technology, 1 credit for radioprotection, 4 credits for seminar activities, and 3 credits for professional laboratories. Additionally, 60 credits are reserved for the professional training internship.

The degree programme is structured, monitored, validated, and updated on a continuous basis, in order to deliver the knowledge and skills defined in the course curriculum and to meet the specific objectives of the course. These specific training objectives are obtainable with a high quality of education which is ensured through various organisations and tools (Quality Committee, Faculty Assessment Committee, Didactic Quality and Efficiency Assessment Committee, OPIS Questionnaires). Through these tools it is possible to measure the improvement in academic performance in all the different phases that contribute to the attainment of the Bachelors degree, in terms of training, exams, assessment of quality as perceived by students, and the acquisition of the professional skills defined in the objectives of the degree programme.

The Didactic Board can approve credits acquired by the student with documented certification by the applicant (in compliance with current legislation on the subject) of the acquisition of professional skills and abilities, as well as other skills and abilities gained in university-level training courses done in accordance with the university. Credits related to the knowledge of a European Union language can be awarded with the presentation of a certificate issued by competent internal or external institutions.

Credits obtained lose their validity if the student interrupts the degree programme for six consecutive academic years or has not complied with attendance obligations for six consecutive academic years, or has not passed exams for more than six consecutive academic years.

Art. 4 European Descriptors for Bachelors degree programmes (DM 16/03/2007, art. 3, comma 7)

Educational objectives are achieved through the student's demonstration of:

1. knowledge and understanding
2. applying knowledge and understanding
3. making judgments
4. communication skills
5. learning skills

As legally defined, graduates are health professionals who work with professional autonomy in providing activities aimed at the prevention, care, and protection of individual and collective health, and who perform the functions identified by the ethical and institutional regulations of their profession.

Graduates are equipped with a preparation in basic disciplines which will provide them with an optimal understanding of the biological processes that determine the physiological and pathological processes at which their preventive, diagnostic, therapeutic, palliative, and complementary intervention is directed. In addition to the Italian language, graduates learn English for the specific professional setting and for the exchange of general information.

The achievement of professional skills is implemented through a theoretical and practical training which includes acquisition of the relational and behavioural skills necessary for the professional

setting. At the end of the degree programme, full mastery of all the necessary skills and their immediate usability in the workplace are ensured.

Art. 5 Attendance Requirements

Attendance of classroom teaching, electives, integrative activities, professional training activities, and the internship is mandatory. Attendance is verified by the teachers, and is necessary for the student to be able to sit the exam. In order to be able to take the exam related to a specific course, it is necessary that the student's attendance of at least 66% of the hours corresponding to the credits assigned to that course has been documented.

The student is required to attend the entire number of internship hours by the end of October. If this is not possible, all makeup hours must be completed by the end of December.

The student is covered by an insurance policy provided by the university against occupational accidents during the internship activities.

Art. 6 Professional Internship

The professional internship is the fundamental training activity for the development of professional, relational, and behavioral skills of diagnostic reasoning and critical thinking. Internship attendance is 100% obligatory for all 60 credits, as required by European regulation.

The practical training activity is usually organised in accordance with the academic calendar, however the specific organisation is the responsibility of the academic director. The academic director is responsible for planning and organising the training activity in collaboration with the tutors of the degree programme. Together they develop the annual training project and propose it to the Degree Programme Council for approval.

Internships are overseen by a tutor. During the internship, the tutor provides an ongoing assessment of the student's learning in order to achieve the maximum effectiveness of the training. If students do not achieve the training objectives and receive a negative evaluation, they are required to repeat the internship at the same or similar facility.

Regarding the organisation of training courses and assessments, please refer to the specific internship rules for each degree programme.

Art. 7 Learning Assessment and Awarding of Credits

Credits are awarded upon the successful passing of the final exam of each course. Points are awarded based on a maximum exam score of 30, except for the foreign language component which is assessed on a pass/fail basis.

The final exam of each course is taken during specific periods, called exam sessions. The start and end dates of the exam sessions can be found in the course schedule at the beginning of the academic year. In each session, exam dates for the same exam are scheduled at least two weeks apart. Students who fail an exam cannot register again to take the same exam during the same exam session.

The exam commission is composed of teachers who are involved in the teaching of the course and is chaired by the president of the exam commission, who is usually the course coordinator. If one or more members of the exam commission is absent during an exam sitting, the president of the commission may call in a substitute.

The annual internship exam, also based on a maximum score of 30, can be taken by the student only upon completion of the total number of hours required for the academic year and after having met the training objectives which are verified through evaluations done in different phases of the internship. The annual internship exam helps to determine the student's final grade-point average. The internship exam must be carried out by a special exam commission chaired by the academic director.

After passing all the exams included in the study plan, including internship exams, the final exam is scheduled. The final exam is chaired by an exam commission nominated by the competent academic authority and in accordance with applicable laws. The final exam consists of two phases:

- a demonstration test of practical skills, which has the value of a state professional licensing exam, organised according to criteria established by the Degree Programme Council and in compliance with current regulations;
- discussion of a thesis

Members of the exam commission for the final exam give their marks based on a 110-point system and can, unanimously, award candidates the highest mark with honours.

There are two sessions in which to take the final exam: October-November and March-April. The final exam cannot be taken more than once in the same session. It may be resat in the following session.

Art. 8 Enrolling in courses of other degree programmes

Students, in addition to the exams established by the degree programme, can enroll in no more than two courses of other degree programmes in the same university. Students who want to take advantage of this possibility must inform the president of the degree programme which offers the course and submit an application to the Educational Affairs Office of the degree programme to which they are enrolled by 31st January, specifying the faculty, the degree programme, and the two courses that they wish to attend.

Art. 9 Progression to subsequent years

The student is enrolled with an 'in progress' status for the entire legal duration of the Bachelors degree programme.

Prerequisites: the student is obliged to take all the exams of the previous year, including the internship exam related to the year of the course, before taking the exams of courses belonging to subsequent years. With regard to the annual internship exam, the student cannot start the following year's internship without having first taken the previous year's internship exam. Exams taken without having complied with the aforementioned prerequisites will be voided.

Art. 10 Recognition of studies completed at other Italian universities or for other degree programmes

Courses and credits completed while enrolled in degree programmes of other Italian universities can be recognised after evaluation of the curriculum sent by the university of origin. The documentation necessary for the request must be presented by the student to the Student Affairs Office, which will verify administrative aspects and forward the request on to the president of the relevant degree

programme. The recognition of credits acquired by the student is formalised by the president of the degree programme where the student wishes to enrol and takes place according to the regulations approved by the Faculty Committee. After having approved the recognition of a defined number of credits, the president of the degree programme approves the student's enrolment to one of the years of the course. In restricted access programmes, enrolment in a given year is contingent on the availability of places.

Art. 11 Recognition of studies completed at other EU universities

The studies carried out while enrolled in degree programmes of other universities of the European Union, as well as the credits obtained, are recognised by the Faculty Board after evaluating the curriculum of the university of origin. After deliberating the recognition of a defined number of credits, the Faculty Board approves the enrolment of the student to one of the years of the course, adopting the same criteria used for Italian universities. In restricted access programmes, enrolment in a given year is contingent on the availability of places.

Art. 12 Recognition of Foreign Degrees

A degree obtained at a foreign university is recognised where bilateral agreements or international conventions exist that ensure the equivalence of the qualification. Foreign university degrees are assessed by a special committee appointed by the faculty where the students wishes to enrol. For non-EU degrees, the provisions of the Presidential Decree of 31 August 1999, n. 394 are followed.

EXAM CALENDAR

* Students may only sit exams for a course if they have fulfilled all course attendance requirements.

JANUARY session

The January exam session is a resit session for exams of the previous academic year, including the internship exam. A regular exam session for courses taught in the first session of the current academic year is reserved exclusively for transfer students.

FEBRUARY session

A regular exam session is scheduled for the courses taught in the first semester of the current year. Exam resits are also scheduled for the courses taught in the previous academic year. An internship exam is scheduled for students who did not take the exam in January.

APRIL session

Exam resits may be scheduled in extraordinary cases.

JUNE-JULY session

There are three exam dates, including an exam date for the internship exam.

SEPTEMBER session

There are two exam dates, including an exam date for the internship exam.

DECEMBER session

Exam resits may be scheduled in extraordinary cases.

The complete exam schedule is published on the university website at the beginning of each academic year.

FINAL EXAM

For the completion of the study plan required by the academic system, the student will have to take a final exam consisting of a practical test which is aimed at assessing the skills required of the profession, as well as a thesis on issues related to the profession.

Students will be able to register for the final degree exam between 1 August and 15 September only if they have a maximum debt of no more than 1 exam and even if all electives, seminar activities, and laboratories are not yet recorded. In order to graduate during the first graduation session scheduled for October /November, undergraduates must have completed all exams, including those of the third year internship, by no later than 30 September of the current year.

Students will be able to register for the final degree exam between 1 January and 15 February only if they have a maximum debt of no more than 1 exam and even if all electives, seminar activities, and laboratories are not yet recorded. In order to graduate during the second graduation session scheduled for March /April, undergraduates must have completed all exams, including those of the third year internship, by no later than 31 January of the current year. If all exams are not passed by 31 January, the student will have to pay additional university fees and sit the final degree exam in the first graduation session of the subsequent academic year.

Description of the Study Plan

The first year is aimed at providing basic biomedical knowledge and the basics of the professional discipline in order to prepare students for their first internship experience which is aimed at introducing students to the profession and teaching them basic skills.

The second year is aimed at deepening the knowledge of interventional cardiology, vascular diagnostics, pneumology, thoracic surgery, and pediatric and adult cardiac surgery. Students will acquire professional skills related to the performance of echocardiographic examinations, cardiorespiratory function evaluations, and extracorporeal circulation in adults and children. Students will learn about hygiene-preventive aspects and complete an internship in settings where they can apply the knowledge and techniques learned.

The third year is aimed at deepening specialised knowledge and acquiring the knowledge and methodologies necessary for professional practice, as well as the ability to work in teams and in complex organisational contexts. The third year internship allows students a gradual assumption of autonomy and responsibility. They will also acquire the scientific research skills and methodologies necessary to prepare their thesis.

Learning Outcomes

At the end of the Degree Programme in Cardiocirculatory and Cardiovascular Perfusion Techniques, graduates will be able to:

- Perform tests for the assessment of respiratory function (spirometry);

- Manage computerised systems for the transmission and management of cardiological examinations;
- Manage the technical execution of the echocardiographic examination, including quantitative and ultrasonic velocimetry evaluations of the cardiac and/or vascular system;
- Perform device checkups of patients with pacemakers or implantable automatic defibrillators;
- Perform instrumental diagnostic procedures in the clinic or with the aid of telemedicine and cardiac telemetry instruments;
- Manage cardiocirculatory and respiratory assistance;
- Use normothermic and hyperthermic extracorporeal methods for antitumour, pelvic, peritoneal, thoracic, limb, and hepatic therapy;
- Apply protocols for organ preservation and transport management;
- Apply extracorporeal dialysis techniques;
- Manage intraoperative blood recovery methods;
- Provide for the ordinary management and maintenance of equipment necessary for extracorporeal circulation techniques;
- Manage electrocardiography, stress electrocardiography, dynamic electrocardiography (Holter), and brady-tachyarrhythmia memory system equipment;
- Ensure the correct application of the required diagnostic and therapeutic prescriptions;
- Autonomously manage extracorporeal circulation methods and the artificially induced haemodynamics of patients on heart-lung machines;
- Apply brain protection techniques in interventions that involve stopping circulation;
- Document extracorporeal circulation data in the medical record;
- Make decisions consistent with the legal and ethical rules that regulate health organisations and professional responsibility;
- Participate in the development of guidelines for procedures implemented in compliance with the quality-safety principle (clinical risk management);
- Use quality assessment and review tools and methodologies;
- Collaborate in teaching and tutoring activities;
- Recognise and respect the roles and competences of other members of the health care team, and establish collaborative relationships;
- Interact and collaborate actively with an interprofessional team.

Study Plan:

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autonomy and responsibility. They will also acquire the scientific research skills and methodologies necessary to prepare their thesis.

The study plan includes a maximum of 20 exams and/or final evaluations, including the internship exams of the first, second, and third year. The exams are organised as integrated exams for coordinated courses or modules. The training course is structured, monitored, validated, and improved on an ongoing basis in order to achieve the training objectives.

Autonomy of Judgment

Graduates of cardiocirculatory and cardiovascular perfusion techniques must demonstrate the ability to:

- apply ethical principles in professional behavior;
- take responsibility for their work during professional practice in accordance with the profile and the code of ethics;
- recognise the differences in competences and responsibilities between the cardiocirculatory and cardiovascular perfusion technician and other health professionals;
- demonstrate a spirit of initiative and autonomy in their professional practice.

Methodologies, training activities, and teaching tools to develop the expected results:

- lectures;
- case discussions in subgroups with full class presentations;
- professional internships.

Evaluation tools to ascertain the achievement of the expected results:

- written and oral exams;
- evaluation feedback on internship activities (through portfolios, structured assessment forms, and clinical reports).

Communicative Ability

Graduates of cardiocirculatory and cardiovascular perfusion techniques must be able to:

- establish professional relationships and collaborate with other health professionals, with awareness of the different professional roles;
- demonstrate effective communication skills with patients and in relationships with other professionals;
- provide guidance to collaborators and students by delegating and supervising health care activities performed by others and ensuring compliance with the quality and safety standards of care planning and management;
- communicate health care assessments and decisions to interdisciplinary health teams in an effective manner using verbal, non-verbal, and written communication;
- collaborate with the care team to implement the application and development of protocols and guidelines;
- communicate effectively with patients, family members, and other professionals in order to provide optimal health care.

Methodologies, training activities, and teaching tools to develop the expected results:

- lectures;

- simulations;
- discussion of cases and of paradigmatic relational situations in sub-groups with full class presentations;
- professional internships.

Evaluation tools to ascertain the achievement of the expected results:

- evaluation feedback during the internship (through portfolios, structured assessment forms, and clinical reports);
- oral and written exams.

Ability to Learn

Graduates of cardiocirculatory and cardiovascular perfusion techniques must be able to:

- demonstrate the ability to continuously search for self-learning opportunities;
- take responsibility for their professional development and respond to continuous changes in health and social knowledge and needs;
- demonstrate independent study skills and use research methods to locate evidence of efficacy;
- demonstrate self-assessment skills and outline their developmental and learning needs.

Graduates must have developed the learning skills that are necessary for them to undertake further studies with a high degree of autonomy.

Evaluations consist of oral or written exams. Students will also be assessed through mid-term progress tests (self-assessment tests and interviews) and written reports on assigned topics.

Admission Requirements

Candidates who hold a high school diploma or another qualification obtained abroad which is recognised as equivalent may be admitted to the Degree Programme. To be admitted to the Degree Programme, students must pass the relevant entrance exam in accordance with current legislation. The knowledge required for admittance, defined annually by the Ministry of Education, Universities, and Research (MIUR), is verified by achieving the minimum required score on the entrance exam. Candidates who do not achieve this score will be assigned Additional Training Obligations which must be completed within the first year of the course.

Organisation and Responsibility of the Degree Programme Commission for Quality Assessment

The Quality Assessment group controls the procedural implementation of quality according to the instructions of the decision-making bodies of Sapienza. Quality is defined according to efficiency and effectiveness indicators. To this end, the QA Group: 1) organises support for teaching activities, monitors a plan of assistance, and counsels students in order to help them overcome any difficulties and complete their thesis; 2) monitors the tutoring activity of “out-of-course” and part-time students; and 3) encourages students to express their opinions of the Degree Programme. The QA management group meets periodically in order to monitor the corrective actions proposed in the Examination Reports.

Professional Opportunities

Profile: Cardiocirculatory and cardiovascular perfusion technician

Functions: Cardiocirculatory and cardiovascular perfusion technicians are responsible for: the management of extracorporeal circulation in cardiac and vascular surgery, oncological surgery, and thoracic and abdominal transplantation; ongoing implantation assistance and management of respiratory and cardiac ECMO (extra corporeal membrane oxygenation); assistance during cardiology procedures in hospitals and territorial health care facilities; the management of aortic counterpulsation and ventricular assist devices (VADs) in intensive care departments; performing respiratory function tests.

Skills: Graduates of cardiocirculatory and cardiovascular perfusion techniques operate in various fields of care and/or research:

- cardiac, vascular, thoracic, and transplant surgery;
- cardiology: diagnostic and interventional haemodynamics, electrophysiology, and echocardiography;
- oncological surgery for antineoplastic treatment;
- telemedicine;
- home care for patients with VADs;
- in university and non-university research laboratories;
- in production and sales industries

Professional opportunities: Graduates of cardiocirculatory and cardiovascular perfusion techniques may practice in the areas listed above and in public or private hospitals as employees or self-employed professionals.

Graduates of cardiocirculatory and cardiovascular perfusion techniques will be able to continue their study path by enrolling in a Masters Degree, contingent on passing an entrance exam. They may also enroll in a first-level professional development programme or in a specialisation course. After attainment of a Masters Degree, graduates can enroll in a second-level professional development programme or a PhD programme.