UNIVERSITA' DEGLI STUDI DI MILANO
PROGRAMME DESCRIPTION - ACADEMIC YEAR 2025/26
BACHELOR
Cardiocirculatory and Cardiovascular Perfusion Techniques (Classe L/SNT3)
Enrolled since 2011/12 Academic Year

HEADING

Degree classification - Denomination and code:	L/SNT3 Health professions for technical assistance
Degree title:	Dottore
Length of course:	3 years
Total number of credits required to complete programme:	180
Years of course currently available:	1st , 2nd , 3rd
Access procedures:	Cap on student, student selection based on entrance test
Course code:	D78

PERSONS/ROLES

Head of Interdepartmental Study Programme

Prof. Gianluca Polvani

Tutors - Faculty

Per l'orientamento:
dott.ssa Fabiana Rossi

per i piani di studio:
prof. Gianluca Polvani
dott.ssa Fabiana Rossi

per stage e tirocini:
dott.ssa Fabiana Rossi

per laboratori e altre attività:
dott.ssa Fabiana Rossi

tesi di laurea:
prof. Gianluca Polvani
dott.ssa Fabiana Rossi

per trasferimenti:
prof. Gianluca Polvani
dott.ssa Fabiana Rossi

per ammissioni lauree magistrali:
dott.ssa Fabiana Rossi

per riconoscimento crediti:
prof. Gianluca Polvani
dott.ssa Fabiana Rossi

Degree Course website

https://fcpc.cdl.unimi.it/it

Phone 02/58002274 - 02/58002520 Email: segreteria.cdl.tfcpc@unimi.it

CHARACTERISTICS OF DEGREE PROGRAMME

General and specific learning objectives

In accordance with European Union standards, graduates in Cardiocirculatory and Cardiovascular Perfusion Techniques are expected to:

- possess the scientific, theoretical and practical knowledge needed to understand biological and hereditary phenomena, as well as the key mechanisms that govern the functioning of organs and apparatuses;
- know the basics and methods of cardiovascular perfusion, and the evolution of the profession over time;
- know the theoretical fundamentals of the profession and how they have evolved over time;
- know the rules and principles that govern the professional functions and responsibilities of cardiovascular perfusionists;
- know the principles of bioethics, deontology and legal medicine, as applicable to the profession;
- have attained a significant degree of professional autonomy, in terms of both decision-making and operational tasks;
- have an adequate theoretical grounding in the basic sciences, with a view to their future application on the job;
- have the knowledge, skills and experience to be able to plan, manage and assess professional interventions;
- have the skills and experience necessary to properly put into practice the theoretical knowledge acquired;
- be able to take ownership of their own professional development;
- have the right methodology and mindset to embark on lifelong learning;
- be able to work along and interact with other professionals within team activities;
- be able to avail themselves of support staff, if necessary, and to contribute to their training;
- be able to tutor students in clinical practice;
- be familiar with the history of medicine and appreciate its ethical implications, with particular regard to mechanical circulatory support;
- be proficient in another language of the European Union, besides Italian.

Additionally, graduates must have acquired the following job-specific knowledge and skills:
- an understanding of biological and physiological phenomena from a quantitative and qualitative perspective;
- an understanding of the structural organisation of the human body, including its most significant anatomical features and clinical aspects (from a macroscopic and microscopic perspective), as well as the mechanisms governing embryonic development and organ differentiation;
- the fundamental morphological characteristics of cardiovascular organs and tissues;
- the fundamental values of medicine and ethics, as well as the essentials of health law and management, and the legal and ethical implications of the profession;
- the professional skills required to work as cardiovascular physiopathology and perfusion technicians;
- the basics of extracorporeal circulation, and, more generally, of mechanical cardiocirculatory, cardiorespiratory and respiratory support;
- the various perfusion systems, and how to use them on patients;
- extracorporeal normothermic and hypothermic perfusion techniques, and how to use them when administering localised antiblastic therapies;
- the core metabolic processes that regulate the functioning of organs and systems, with particular regard to the heart, arterial and venous circulation and the respiratory system;
- the fundamentals of organ and system physiology, with particular regard to blood vessels and the heart;
- the fundamentals of the pharmacological treatment of cardiovascular diseases;
- the biological principles underpinning the techniques for protecting the myocardium, bone marrow and brain during extracorporeal perfusion;
- the biological principles underpinning the techniques for keeping organs alive during prolonged ischaemia;
- the basic principles and theoretical foundations of fluid dynamics;
- knowledge of the electrical activity of the heart, as necessary to carry out checks on pacemakers and automated implantable defibrillators;
- professional autonomy in managing instrumental diagnostic procedures;
- the ability to properly administer prescribed medications and treatment;
- an understanding of the functioning of medical equipment and supplies;
- notions of disease prevention and epidemiology, with particular regard to conditions affecting the cardiovascular system;
- notions of internal medicine, with particular regard to the cardiovascular and thoraco-pulmonary systems;
- the general principles of surgery, with particular regard to thoracic and cardiovascular surgery.

Professional profile and employment opportunities

This degree prepares future cardiovascular physiopathology and perfusion technicians, i.e. healthcare professionals who are able to operate and do maintenance on medical devices for extracorporeal circulation, haemodynamics and circulatory support, based on their sound theoretical and practical knowledge of cardiovascular perfusion techniques and the physiopathology of the cardiovascular system. Cardiovascular physiopathology and perfusion technicians work side by side with other graduate healthcare professionals, performing their functions and responsibility with full professional and technical autonomy. They are accountable for the correct implementation of all procedures within their scope of competence, and are bound to comply with work protocols designed by their supervising manager. They also monitor medical equipment in order to check that it is functioning properly, carrying out ordinary maintenance and correcting small malfunctions. Lastly, they participate in the planning and organisation of work activities within their department or unit.

Graduates in Cardiocirculatory and Cardiovascular Perfusion Techniques can work:

1. in cardiac surgery units, with functions related to the management of extracorporeal circulation and mechanical circulatory support devices;
2. in oncology units, with functions related to the administration of localised antiblastic therapies;
3. in transplant centres, which require expertise in mechanical circulatory support and organ preservation techniques;

4. in neurosurgery units, to assist with surgical procedures performed under deep hypothermia;
5. in haemodynamic and cardiac catheterisation centres;
6. in diagnostic laboratories specialised in cardiac ultrasound and vascular colour doppler;
7. for manufacturers and resellers of cardiovascular perfusion equipment;
8. in university and non-university biomedical research centres.

Initial knowledge required

To be admitted into the degree programme, a candidate must have an Italian secondary-school diploma or similar diploma obtained overseas and deemed equivalent.

Admission into the programme is capped, at a national level, pursuant to Law no. 264 of 2 August 1999.

The number of students who may be admitted is set each year pursuant to a decree of the Ministry of Universities and Research (MUR), based on findings provided by the university in terms of available instructional, classroom, and clinical resources (human and otherwise), as well as the demand for the type of professionals contemplated for this Class as determined by the Region of Lombardy, and the Ministry of Health.

The admission test is given in accordance with directives and timetables established from year to year by the MUR.

The admission test will be administered as a national exam, generally in the month of September. The date will be set pursuant to a decree issued by MUR.

Additional learning requirements (OFA)

Students who answered less than 50% of the Biology and Chemistry questions on the admission test will be required to finish a set of additional learning requirements (OFA). These prerequisites may be met through specifically assigned remedial work. Any failure to complete the OFA will make it impossible for the student to sit the exam in: Biomedical Sciences.

Timely notice of the various courses will be posted to: https://fcpc.cdl.unimi.it/it

Compulsory attendance

Attendance of all educational activities contemplated in the study programme is mandatory.

To be allowed to sit the for-credit exam, students must have attended at least 75% of the educational programming contemplated for each course.

Degree programme final exams

Degrees in Cardiocirculatory and Cardiovascular Perfusion Techniques are awarded at the end of three years of study once a student has passed all relevant exams, including the English-language proficiency examination, for a total of 173 CFU, as well as a final theoretical/practical exam worth 7 CFU, for a total of 180 CFU.

The final exam consists in the submission and defence of a written thesis on a topic relating to practical-clinical work completed during the students for-credit pre-professional internship.

The final examination acts as a State Exam which serves to license students to practice the profession.

Campus

Educational activities for the Degree Programme in Cardiocirculatory and Cardiovascular Perfusion Techniques are offered through the teaching facilities located at the Centro Cardiologico Monzino, Via Parea n°4, Milan, as well as other facilities coordinated by the Faculty of Medicine and Surgery, including a number of teaching hospitals, both public and private, within the national health service, and holding academic accreditation. The Departments connected with the Faculty of Medicine and Surgery, as well as the teaching hospitals and cardiovascular diagnosis and treatment centres, offer state-of-the-art scientific and therapeutic equipment. These facilities are likewise used for clinical training, professional internships, and activities relating to the final exam.

EXPERIENCE OF STUDY ABROAD AS PART OF THE TRAINING PROGRAM

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.

The agreements entered into by the University with over 300 universities from the 27 EU member countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organisations.

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

The University of Milan is a member of the 4EU+ European University Alliance that brings together eight public multidisciplinary universities: University of Milan, Charles University of Prague, Heidelberg University, Paris-Panthéon-Assas University, Sorbonne University of Paris, University of Copenhagen, University of Geneva, and University of Warsaw. The 4EU+ Alliance offers integrated educational pathways and programmes to promote the international mobility of students (physical, blended and virtual).

How to participate in Erasmus mobility programs

The students of the University of Milan can participate in mobility programmes, through a public selection procedure.

Ad hoc commissions will evaluate:

- Academic career

- the candidate's proposed study programme abroad
- his/her foreign language proficiency
- the reasons behind his/her application

Call for applications and informative meetings
The public selection for Erasmus+ mobility for study generally begins around February each year with the publication of a call for applications specifying destinations and requirements. Regarding the Erasmus+ Mobility for Traineeship, the University of Milan usually publishes two calls a year enabling students to choose a destination defined by an inter-institutional agreement or to find a traineeship position on their own.

The University organises informative meetings to illustrate mobility opportunities and rules for participation.

Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which may be supplemented by the University funding for disadvantaged students.

Language courses
Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM).
https://www.unimi.it/en/node/8/

Learn more at https://www.unimi.it/en/node/274/

For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
Contacts: InformaStudenti;
Student Desk booking through InformaStudenti

1st COURSE YEAR Core/compulsory courses/activities common			
Learning activity		**Ects**	**Sector**
Biomedical Engineering		8	(2) ING-INF/07, (2) ING-INF/06, (2) FIS/07, (2) ING-IND/22
Biomedical Science		6	(1) MED/03, (1) MED/04, (2) BIO/10, (1) MED/07, (1) BIO/13
Cardiovascular Diseases		4	(2) MED/50, (1) MED/11, (1) MED/23
Clinical Pathology and Pharmacology		5	(1) MED/09, (2) BIO/14, (1) MED/18, (1) MED/05
Computer Science Course		3	INF/01
English assessment B1 (2 ECTS)		2	ND
Epidemiology, Medical Statistics and Occupational Medicine		8	(2) MED/01, (2) MED/45, (1) MED/44, (2) MED/42, (1) MED/36
Multidisciplinary Seminars and Insights (I year)		1	ND
Principles of Anatomy and Physiology		7	(3) BIO/09, (1) BIO/17, (3) BIO/16
Professional Laboratories (I year)		1	MED/50
Training (I year)		15	MED/50
	Total compulsory credits	60	
Elective courses			
2nd COURSE YEAR Core/compulsory courses/activities common			
Learning activity		**Ects**	**Sector**
Cardiothoracic Imaging and Cardiovascular Sonography		6	(2) MED/11, (2) MED/22, (2) MED/36
Electrocardiography, Arrhythmology and Electrostimulation		4	(1) MED/50, (3) MED/11
Extracorporeal Circulation		8	(4) MED/50, (1) MED/22, (1) MED/41, (2) MED/23
Medicine Specialties		7	(1) MED/50, (2) MED/14, (1)

			MED/15, (2) MED/26, (1) MED/06
Multidisciplinary Seminars and Insights (II year)		1	ND
Pediatric Heart diseases		6	(2) MED/50, (2) MED/20, (1) MED/41, (1) MED/23
Professional Laboratories (II year)		1	MED/50
Respiratory Medicine and Lung Diseases		5	(1) MED/50, (2) MED/10, (2) MED/21
Training (II year)		20	MED/50
	Total compulsory credits	58	

Elective courses

3rd COURSE YEAR Core/compulsory courses/activities common

Learning activity		Ects	Sector
Advanced Techniques of Perfusion and Extracorporeal Life-Support		5	(2) MED/50, (1) MED/11, (2) MED/23
Cardiovascular Research		4	(2) SECS-S/02, (1) MED/02, (1) MED/23
Health Law and Organization		4	(1) SECS-P/07, (1) IUS/07, (1) SPS/07, (1) SECS-P/10
Invasive Cardiovascular Techniques		4	(1) MED/50, (1) MED/11, (2) MED/23
Multidisciplinary Seminars and Insights (III year)		1	ND
Professional Laboratories (III year)		1	MED/50
Psychological, Legal and Organizational principles of Professional Practice		5	(1) MED/50, (2) M-PSI/01, (2) MED/43
Training (III year)		25	MED/50
	Total compulsory credits	49	

Elective courses

End of course requirements

Final Exam		7	NA
	Total compulsory credits	7	