



**UNIVERSITÀ
DI SIENA
1240**

General information

Denomination

Master's Degree (I Level): CARDIAC, PULMONARY AND VASCULAR ULTRASOUND TECHNIQUES

Learning objectives

The master's degree aims to train experts in the field of cardiac, vascular and pulmonary ultrasound by providing a theoretical and practical in-depth tool. Thanks to the participation of international and national teachers of the highest level, students will have the opportunity to develop up-to-date skills and to confront themselves during frontal and interactive lessons with extremely topical issues, starting from the fundamentals of cardiovascular anatomy and physiology up to the development of executive and analytical skills of more advanced and complex examinations, including the main cardiomyopathies and valvular diseases, both in acute and chronic settings. The master's degree will allow the training of personnel dedicated to the execution of the echocardiogram ("sonographers") to support the cardiologist, but also the in-depth study for Specialist Doctors and Specialists in General Medicine for the acquisition of high skills of the 360° ultrasound method in hospital and outpatient settings

Credits

60

Hours

1500

Duration in months

12

Deadline for applications

15/12/2025

Start date

January 2026

End date

January 2027

Absence percentage
20%
Website
Expected languages
Italian, English
Department
Department of Medical Biotechnology (DBM)
Teaching Contacts
Mandoli Giulia Elena e-mail giulia.mandoli@unisi.it
Prof Matteo Cameli e-mail matteo.cameli@unisi.it

Support and agreement

Support and agreement
No support or convention

Access qualifications

Class	Description	Type Degree
SNT1 class	Nursing health professions and obstetric health professions	L
Class L/SNT1	Health, nursing and obstetric health professions (new system pursuant to L Ministerial Decree 270/04)	L
SNT3 class	Technical health professions	L
L/SNT3 Class	Technical health professions (new system pursuant to Ministerial Decree 270/04)	L
Class LM-41	Medicine and Surgery (new system pursuant to Ministerial Decree 270/04)	LM
LM/SNT3 Class	Technical Health Professions Sciences	LM
LM/SNT1 Class	Nursing and Midwifery Sciences	LM
Class LS46	Medicine and surgery	LS
SNT LS1 class	Nursing and Midwifery Sciences	LS
-	Medicine and surgery	V.O.
-	Medical Radiology Technician	DU

Legend of degree classes - L: bachelor's degree - LS: specialist degree - LM: master's degree - O.V. degree under the old system - DU: university diploma
- Other diplomas referred to in laws no. 42 of 26 February 1999, no. 251 of 10 August 2000 transposed by law no. 1 of 8 January 2002 (only for the health professions of nursing, midwifery, rehabilitation, health technician, prevention techniques and for graduates in social work)
Action on patient No
Mannequin alternative Yes
Register registration Yes
Professional Register Surgeon; nursing professions; medical radiology technicians and technical health professions, rehabilitation and prevention
Professional qualification Yes
Type of professional qualification Surgeon and where non-qualifying degree
Specialization No

Application for admission or enrolment

Admission procedures Exhaustion
Minimum number of participants 5
Maximum number of subscribers 60

Application fees

Total amount in €
3000.00
First instalment amount in €
1500.00
Amount of the second instalment in €
1500.00
Second instalment deadline
Wednesday 15 April 2026

Training

Teaching methods
Distance learning (online lessons in synchronous mode)
Internal venue
Cardiovascular Diagnostics Unit, Medical Biotechnology Department, UNISI

Title Area: Principles of ultrasonography and echocardiogram standard total credits area: 6 Professors in charge: Cameli Matteo - Focardi Marta
<i>Didactic training activity:</i> Normal echocardiogram: standard projections and normal values CFU: 2 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)
<i>Didactic training activity:</i> Handheld ultrasound: how to perform an echocardiogram CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)
<i>Didactic training activity:</i> Organization of the echocardiographic clinic CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

<p><i>Didactic educational activity:</i> Principles of physics of ultrasound and ultrasound probes CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Educational activity:</i> Reporting of the echocardiographic examination CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p>Title Area: Cardiovascular Anatomy and Physiology Total credits area: 4 Professors in charge: Galzerano Giuseppe - Pastore Maria Concetta</p>
<p><i>Didactic activity:</i> Anatomy and physiology of the vascular system CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Teaching activity:</i> Pulmonary anatomy and cardio-pulmonary coupling CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Teaching activity:</i> Principles of cardiac and coronary anatomy CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Didactic educational activity:</i> Principles of ventricular and valvular cardiac physiology CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p>Title Area: Study of cardiomyopathies Total credits Area: 11 Professors in charge: Cameli Paolo - Cavigli Luna - D'Ascenzi Flavio</p>
<p><i>Didactic educational activity:</i> Differential diagnosis of cardiomyopathies with dilated phenotype CFU: 2 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Didactic educational activity:</i> Differential diagnosis of cardiomyopathies with hypertrophic phenotype CFU: 2 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Educational activity:</i> Speckle Tracking echocardiography applied to the left ventricle CFU: 1 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Didactic training activity:</i> Echocardiogram in newborns and children and main congenital heart diseases CFU: 2 SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>

Teaching activity: Lung ultrasound: principles and clinical applications

CFU: 2

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Didactic training activity: Echocardiographic study of the athlete's heart

CFU: 1

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Didactic training activity: Echocardiographic study of the left ventricle: dimensional and functional evaluation

CFU: 1

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Area Title: Acute and chronic ischemic heart disease

Total credits area: 6

Professors in charge: Cameli Matteo - Focardi Marta

Didactic activity: Echocardiography from physical and pharmacological stress

CFU: 1

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Didactic educational activity: Echocardiography in chronic ischemic heart disease

CFU: 2

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Didactic training activity: Echocardiography in acute myocardial infarction

CFU: 2

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Didactic activity: Lung ultrasound in the acute setting

CFU: 1

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Area Title: Valvulopathies and Valvular Heart Disease

Total CFU area: 10

Responsible professors: Lisi Matteo - Mandoli Giulia Elena

Didactic training activity: Echocardiography in mixed and combined valvulopathies

CFU: 1

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Didactic training activity: Echocardiography in patients with prosthetic valves

CFU: 2

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

Didactic training activity: Transesophageal echocardiogram

CFU: 1

SSD code: MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)

<p><i>Didactic training activity:</i> Study of the aortic valve: stenosis and insufficiency <i>CFU:</i> 2 <i>SSD code:</i> MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Educational activity:</i> Study of the mitral valve: primary and secondary insufficiency and stenosis <i>CFU:</i> 2 <i>SSD code:</i> MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Didactic activity:</i> Study of tricuspid and pulmonary valves <i>CFU:</i> 2 <i>SSD code:</i> MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p>Title Area: Vascular ultrasound Total credits area: 4 Professors in charge: Galzerano Giuseppe - Pastore Maria Concetta</p>
<p><i>Didactic activity:</i> Carotid Doppler <i>CFU:</i> 1 <i>SSD Code:</i> MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Didactic training activity:</i> Doppler of the peripheral arterial district <i>CFU:</i> 1 <i>SSD code:</i> MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Didactic activity:</i> Venous Doppler of the lower limbs <i>CFU:</i> 1 <i>SSD code:</i> MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p><i>Didactic activity:</i> Doppler method: tips and tricks <i>CFU:</i> 1 <i>SSD code:</i> MED/11 (DISEASES OF THE CARDIOVASCULAR SYSTEM)</p>
<p>Choice of internship/traineeship TRAINING</p>
<p>Internship/traineeship procedures Attendance at the outpatient clinics of the Cardiovascular Diagnostics Unit and the Clinical-Surgical Cardiology Unit (ICU) of the University of Siena (AOUS Le Scotte)</p>
<p>Carrying out structures Cardiology Unit, AOUS</p>
<p>Credits awarded internship/traineeship 14</p>
<p>Internship/Internship Hours 350</p>

Internship/traineeship end date

December 2026

Teachers in charge of internships/internships:

Cameli Matteo - Mandoli Giulia Elena

Intermediate verification tests (Modalities)

Colloquy

Assessment methods

Thesis or final paper, Interview aimed at verifying the knowledge acquired

Credits awarded to the final exam

5

Collegial bodies**Teaching Board**

Body composed of all area managers

Board of Directors

Yes