

كلية: الطب

برنامج/ جراحة القلب والاعوية الدموية

*Republic of Yemen*  
**21 September University for Medicals & Applied Sciences**  
**Faculty of Medicine**

# Cardiovascular Surgery MD Program Specification



## Preparation Committee:

- 1-
- 2-
- 3-

## Program Coordinator:

- 1-
- 2-

# Program Specifications of Cardiovascular Surgery

## Introduction

The MD in Cardiovascular Surgery is a postgraduate medical specialization program designed to produce highly competent cardiovascular surgeons capable of managing complex cardiac and vascular conditions. The program integrates advanced theoretical knowledge, clinical competencies, and surgical techniques, enabling graduates to serve as leaders in cardiovascular surgery through patient care, academic research, and community service.

## MD Cardiovascular Surgery Program – General Information

Field	Information
Scientific name of the program	MD in Cardiovascular Surgery
The body responsible for granting the degree	21 September University – Republic of Yemen
The body responsible for the program	Faculty of Medicine – 21 September University
Departments participating in the program	Department of Surgery (Cardiovascular Unit), Department of Anesthesia and ICU, Department of Pathology, Department of Radiology
Study Language of the Program	English
Starting year of the program	2025–2026
Study methods in the program	Theoretical lectures, clinical rotations, skill labs, seminars, thesis research, simulation-based learning
Location of Delivery	University Teaching Hospital and Affiliated Cardiac Centers
Study system	Semester-based system with credit hours and clinical rotations
Number of years needed for completion of the program	3 academic years + 2 year for clinical practicum and thesis (Total: 5 years)
Early exit option	Students unable to complete the full program may exit after 4 semesters (2 year) with a Postgraduate Diploma in Cardiovascular Sciences (non-surgical track)
Entry requirements	MBBS or equivalent from an accredited institution; completion of internship year
Minimum grade requirements	Minimum “Good” grade in MBBS (or equivalent GPA $\geq 2.5$ out of 4)
Other admission requirements	Personal interview, English proficiency (TOEFL $\geq 450$ or IELTS $\geq 4.5$ ), ICDL certificate, and passing an entry examination (if required by faculty)

<b>Prepared by</b>	Department of Cardiovascular Surgery – Faculty of Medicine, 21 September University
<b>Year of the program Accreditation</b>	2025

<b>University Vision, Mission and Aims</b>	
<b>University Vision</b> ■	
A Contemporary University with National Responsibility and Faith Identity	
<b>University Mission</b> ■	
Leadership of transformation headway in managing and providing the health care with all partners via having the distinction standard in education and applied and medical researches that meet the needs of Yemeni people and regional influence.	
<b>Aims of the University</b> ■	
<ul style="list-style-type: none"><li>• Ensuring the application of quality standards and having the distinction standards in medical and applied sciences, scientific research and community service.</li><li>• Adopting student-centered learning, the partnership with them for life, consolidating the principles of national responsibility and faith identity, looking after them and developing their capabilities after graduation and during work.</li><li>• Attracting and Eemploying scientists, cadres and talents to gain minds and put an end for the “brain drain” in a way that promotes and ensures the availability of thinkers, businessmen and good citizens.</li><li>• Developing the distinguished academic infrastructure continuously and establishing modern research and service centers with high efficiency that can give a real effect locally and regionally.</li><li>• Enhancing the university status as a preferred partner for local, regional and international partnership through implementing creative styles of education, exchanging researches and knowledge, and providing real and effective outcomes for developing professional practices to benefit from them locally and regionally.</li></ul>	

<b>Faculty Vision, Mission and Aims</b>	
<b>Faculty Vision</b> ■	
A distinguished Medical Faculty capable of competing locally and regionally.	
<b>Faculty Mission</b> ■	أ
That the Faculty of Medicine be contemporary in providing a distinguished educational level based on creativity and innovation and a true partner in facing the main national health challenges and in treating patients with high quality based on research to solve problems that leads to integrated health care in an ethical context	
<b>Aims of the Faculty</b> ■	
<ul style="list-style-type: none"><li>• Finding effective solutions for the university hospital, the infrastructure of the College and its annual budget.</li><li>• Addressing the gap in human resources adequately and efficiently, and developing them on a professional basis.</li><li>• Improving the quality and quality of the human medicine program in accordance with quality standards and national and international academic accreditation.</li><li>• Strengthening governance and management systems, consolidating decentralization, and practicing transparency and accountability.</li><li>• Building the students' abilities to think, analyze and solve problems in research methods that qualify them for the labor market and achieve their practical and professional aspirations in the future.</li><li>• Contribute to supporting scientific research directed on the basis of planning related to comprehensive development goals in Yemen.</li><li>• Forming a real and effective partnership with the community, its institutions and its counterparts in a national, Arab and international context</li></ul>	

<b>Department Mission and Aims</b>	
<b>Department Mission</b> ■	
To provide excellence in cardiovascular surgical education, research, and patient care by training competent and ethical surgeons capable of delivering high-quality, evidence-based cardiovascular care. The department is committed to fostering innovation, scientific inquiry, and continuous improvement in surgical techniques and technologies to address national and regional health challenges.	
<b>Department Aims</b> ■	
<ol style="list-style-type: none"><li>1. Deliver a comprehensive curriculum combining theoretical knowledge and surgical expertise.</li><li>2. Train competent cardiovascular surgeons capable of performing advanced procedures.</li></ol>	

3. Promote scientific research addressing local and regional cardiovascular health issues.
4. Foster ethical and professional conduct in clinical practice.
5. Contribute to public health through surgical services and awareness campaigns.
6. Encourage continuous learning through workshops and professional development activities.

### Program Mission and Aims

#### Program Mission ■

To prepare highly skilled cardiovascular surgeons who possess advanced scientific knowledge, clinical competence, and ethical values to meet the growing demands of cardiovascular care in Yemen and the region. The program emphasizes evidence-based education, hands-on surgical training, and research innovation to improve patient outcomes and contribute to national health priorities

#### Program Aims ■

- 1- Provide postgraduate students with a rigorous and up-to-date academic foundation in cardiovascular surgery, integrating theory with clinical and operative practice.
- 2- Equip students with the practical and professional skills required to perform a wide range of cardiovascular surgical procedures independently and safely.
- 3- Foster a research-oriented environment that encourages students to investigate local cardiovascular health issues, contribute to the scientific community, and implement innovative solutions.
- 4- Promote adherence to ethical standards, patient-centered care, and responsible medical conduct throughout clinical practice.
- 5- Prepare graduates to actively engage in national and regional efforts to prevent and manage cardiovascular diseases through education, outreach, and clinical service.
- 6- Encourage lifelong learning and professional development through continuing medical education, participation in conferences, and collaboration with local and international institutions.

### Program Benchmarks

The MD in Cardiovascular Surgery program was developed based on national, regional, and international benchmarks to ensure high-quality standards and global compatibility. The reference points used include:

**1. National Regulations:**

- Ministry of Higher Education and Scientific Research – Yemen
- National Academic Reference Standards (NARS) for medical programs

**2. Regional Accreditation Bodies:**

- Arab Network for Quality Assurance in Higher Education (ANQAHE)

**3. Comparable Academic Programs at Reference Universities:**

- [Cairo University– Egypt](#)
- [Mansoura University, Egypt](#)
- [University of Toronto](#)
- [Harvard Medical School – USA](#)
- [King Saud University – Saudi Arabia](#)

**4. International Professional Organizations:**

- [American Board of Thoracic Surgery \(ABTS\)](#)
- [European Board of Cardiothoracic Surgery \(EBCTS\)](#)

**Survey of Similar Accredited Programs at National and International Universities (Benchmarks)**

البيانات المطلوبة	البرنامج الأول	البرنامج الثاني	البرنامج الثالث	البرنامج الرابع	البرنامج الخامس	البرنامج السادس	البرنامج الحالي
اسم البرنامج	MD in Cardiovascular Surgery	MD in Cardiovascular Surgery	Cardiothoracic Surgery MD	Cardiovascular and Thoracic Surgery	Cardiovascular Surgery	Cardiovascular Surgery	MD in Cardiovascular Surgery
اسم الكلية / المركز / المعهد	Faculty of Medicine	Faculty of Medicine	Faculty of Medicine	Faculty of Medicine	College of Medicine	College of Medicine	Faculty of Medicine
اسم الجامعة	Cairo University	Mansoura University	University of Toronto	Harvard University	King Saud University	Ain Shams University	21 September University
اسم الدولة	Egypt	Egypt	Canada	USA	Saudi Arabia	Egypt	Yemen
طبيعة الدراسة	مقررات وأطروحة	مقررات وأطروحة	مقررات وأطروحة	مقررات وأطروحة	مقررات وأطروحة	مقررات وأطروحة	مقررات وأطروحة
أسلوب الدراسة	انتظام	انتظام	انتظام	انتظام	انتظام	انتظام	انتظام
عدد الفصول الدراسية	6	6	6	6	6	6	6

إجمالي عدد الساعات المعتمدة (بدون أطروحة)	36	36	36	36	36	36	43
عدد الساعات المعتمدة للمقررات الإلزامية	30	30	30	30	30	30	43
عدد الساعات المعتمدة للمقررات الاختيارية	6	6	6	6	6	6	0
عدد المقررات الإلزامية	10	10	10	10	10	10	13
عدد المقررات الاختيارية	2	2	2	2	2	2	0
وجود مقررات إضافية تكميلية وعددها	نعم (2)	نعم (2)	نعم (1)	نعم (1)	نعم (2)	نعم (2)	لا
عدد الساعات المعتمدة للأطروحة	6	6	6	6	6	6	6
عدد الساعات الكلية للبرنامج	42	42	42	42	42	42	49
المدة المحددة لإنجاز الأطروحة	سنة	سنة	سنة	سنة	سنة	سنة	سنة
الحد الأدنى لإنهاء البرنامج	3 سنوات	3 سنوات	3 سنوات	3 سنوات	3 سنوات	3 سنوات	3 سنوات
الحد الأعلى لإنهاء							

## Intended Learning Outcomes (ILOs)

### A. Knowledge and Understanding

Upon successful completion of the MD Cardiovascular Surgery program, the graduate will be able to:

- **A1:** Describe advanced anatomical and physiological concepts related to the cardiovascular system.
- **A2:** Explain the pathophysiology and classification of major cardiovascular diseases.
- **A3:** Discuss diagnostic procedures and treatment modalities in cardiovascular surgery.
- **A4:** Recognize the principles of perioperative care, pharmacology, and critical care relevant to surgical patients.
- **A5:** Understand current research trends and evidence-based practices in cardiovascular surgery.

### B. Cognitive (Intellectual) Skills

Upon successful completion, the graduate will be able to:

- **B1:** Analyze complex clinical scenarios and formulate appropriate surgical plans.
- **B2:** Evaluate diagnostic imaging and investigation results for surgical decision-making.
- **B3:** Solve problems related to complications, emergencies, and comorbidities in cardiovascular patients.
- **B4:** Critically appraise scientific literature and apply research findings to practice.

### C. Practical and Clinical Skills

Upon successful completion, the graduate will be able to:

- **C1:** Perform cardiovascular surgical procedures with technical proficiency under supervision.
- **C2:** Use and interpret intraoperative tools and monitoring systems accurately.
- **C3:** Apply proper infection control and patient safety measures in surgical settings.
- **C4:** Document and maintain accurate surgical records and case reports.
- **C5:** Conduct clinical research in the field of cardiovascular surgery.

### D. General and Transferable Skills

Upon successful completion, the graduate will be able to:

- **D1:** Communicate effectively with patients, families, and the healthcare team.
- **D2:** Work collaboratively in multidisciplinary teams.
- **D3:** Manage time and clinical responsibilities efficiently.
- **D4:** Demonstrate commitment to lifelong learning and continuous self-improvement.

## ▪ Program Structure:

### Program Structure

ساعة معتمدة، 30 الحد الأدنى لعدد الساعات المعتمدة أو الوحدات الدراسية لنيل درجة الماجستير في تخصص معين هو ساعات معتمدة للرسالة العلمية 6 ويخصص إضافة لذلك

يتكون هيكل البرنامج من المتطلبات التالية:

المتطلبات	عدد المقررات	الساعات المعتمدة	الوزن النسبي
مقررات استدرائية	حسب الحاجة	-	
مقررات إجبارية	13	43	
مقررات اختيارية	0	0	
رسالة الماجستير	1	6	
الإجمالي الكلي	14	49	

### أولاً: المقررات الاستدراكية (إن وجدت)

يجب على المتقدمين غير الحاصلين على خلفيات أكاديمية طبية مناسبة أن يجتازوا دورات تمهيدية والتي قد تكون أي من أو جميع المقررات التالية (حسب قرار لجنة القبول):

اسم المقرر	Course Title	نظرية Th.	عملية Pr.	تمارين/Seminar	Total الإجمالي C.H	المتطلبات القبلية
-	-	-	-	-	-	-

إجمالي الساعات المعتمدة: حسب الحاجة

### Compulsory Courses Summary Table

Course Title	Code	Th.	Pr.	Seminar	Total C.H.	Study Days	Pre-Requisites
Advanced CV Anatomy & Physiology	CVS 601	2	1	0	3	حسب الجدول	-
Diagnostic Modalities	CVS 602	2	1	0	3	حسب الجدول	-
Principles of Surgical Techniques	CVS 603	2	1	0	3	حسب الجدول	-
CV Pathology	CVS 604	2	1	0	3	حسب الجدول	-
Research Methodology	CVS 605	2	1	0	3	حسب الجدول	-
Adult Cardiac Surgery	CVS 606	2	2	0	4	حسب الجدول	CVS 601
Pediatric Cardiac Surgery	CVS 607	2	1	0	3	حسب الجدول	CVS 601
Vascular Surgery	CVS 608	2	1	0	3	حسب الجدول	CVS 603
Cardiopulmonary Bypass and ICU	CVS 609	2	1	0	3	حسب الجدول	CVS 602
Minimally Invasive Surgery	CVS 610	1	1	0	2	حسب الجدول	CVS 606
Emergency CV Surgery	CVS 611	2	1	0	3	حسب الجدول	CVS 606
Advanced CV Imaging	CVS 612	1	1	0	2	حسب الجدول	CVS 602
Ethics & Legal Issues	CVS 613	2	0	0	2	حسب الجدول	-
Clinical Practicum	CVS 614	0	6	0	6	حسب الجدول	CVS 606-613

ساعة معتمدة 43: إجمالي الساعات المعتمدة للمقررات الإلزامية

### ثالثاً: المقررات الاختيارية

لا توجد مقررات اختيارية في هذا البرنامج.

### رابعاً: رسالة الماجستير

على الطالب إعداد ومناقشة رسالة علمية في تخصص جراحة القلب والأوعية الدموية، بواقع 6 ساعات معتمدة

## Curriculum Map – Mapping Program ILOs with Courses

Courses	A 1	A 2	A 3	A 4	A 5	B 1	B 2	B 3	B 4	C 1	C 2	C 3	C 4	C 5	D 1	D 2	D 3	D 4
CVS 601 – Advanced CV Anatomy & Physiology	✓	✓																
CVS 602 – Diagnostic Modalities		✓	✓			✓	✓				✓							
CVS 603 – Principles of Surgical Techniques			✓	✓		✓				✓	✓	✓	✓					
CVS 604 – CV Pathology	✓	✓	✓															
CVS 605 – Research Methods & Biostatistics					✓			✓	✓					✓			✓	✓
CVS 606 – Adult Cardiac Surgery			✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	
CVS 607 – Pediatric Cardiac Surgery			✓	✓		✓	✓			✓	✓	✓	✓		✓	✓		
CVS 608 – Vascular Surgery			✓	✓		✓	✓	✓		✓	✓	✓	✓			✓	✓	
CVS 609 – Bypass & ICU Manageme nt			✓	✓		✓	✓	✓		✓	✓	✓	✓			✓		
CVS 610 – Minimally Invasive Surgery			✓				✓	✓	✓	✓	✓	✓	✓			✓		
CVS 611 – Emergency CV Surgery			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓

CVS 612 – Advanced CV Imaging		✓	✓		✓	✓	✓				✓						
CVS 613 – Ethics & Legal Issues				✓	✓							✓		✓	✓		
CVS 614 – Clinical Practicum			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CVS 700 – Master's Thesis					✓	✓		✓					✓			✓	✓

### Teaching Strategy

No	Teaching Strategy	Description
1	Lectures	To provide foundational and advanced theoretical knowledge.
2	Clinical Rotations	Real-life clinical exposure under supervision in cardiac and vascular units.
3	Skills Labs	Simulation-based training on models and advanced surgical instruments.
4	Seminars & Case Discussions	Student-led or supervised analysis of cases to encourage critical thinking.
5	Research Activities	Guided research projects and thesis development aligned with local needs.

### Assessment Strategy

No	Assessment Strategy	Description
1	Written Examinations	MCQs, SAQs, and essay questions to assess theoretical understanding.
2	Clinical Examinations	OSCEs and structured clinical evaluations during rotations.
3	Logbooks and Portfolios	Tracking practical procedures and reflective learning.
4	Thesis Evaluation	Proposal defense, final thesis submission, and oral viva.
5	Continuous Assessment	Class participation, presentations, and attendance tracking.
6	Case Report Presentations	Evaluation of analytical and communication skills.
7	Peer and Supervisor Feedback	Regular feedback to support learning and identify areas of improvement.

## Study Plan (5-Year Distribution)

### Year 1 – Semester 1

Course Code	Course Title (English)	Course Title (Arabic)	Pre-Requested	Th	Pr	Tut	Total C.H.
CVS 601	Advanced Cardiovascular Anatomy & Physiology	التشريح والفيزيولوجيا المتقدمة للقلب والأوعية	None	2	1	0	3
CVS 602	Diagnostic Modalities in Cardiovascular Diseases	الوسائل التشخيصية لأمراض القلب والأوعية الدموية	None	2	1	0	3
CVS 603	Principles of Surgical Techniques	مبادئ التقنيات الجراحية	None	2	1	0	3
<b>Total Credit Hours – Semester 1</b>							<b>9</b>

### Year 1 – Semester 2

Course Code	Course Title (English)	Course Title (Arabic)	Pre-Requested	Th	Pr	Tut	Total C.H.
CVS 604	Cardiovascular Pathology	أمراض القلب والأوعية المرضية	None	2	1	0	3
CVS 605	Research Methodology and Biostatistics	منهجية البحث والإحصاء الحيوي	None	2	1	0	3
<b>Total Credit Hours – Semester 2</b>							<b>6</b>

### Year 2 – Semester 1

Course Code	Course Title (English)	Course Title (Arabic)	Pre-Requested	Th	Pr	Tut	Total C.H.
CVS 606	Adult Cardiac Surgery	جراحة القلب للكبار	CVS 601	2	2	0	4
CVS 607	Pediatric Cardiac Surgery	جراحة القلب للأطفال	CVS 601	2	1	0	3
<b>Total Credit Hours – Semester 3</b>							<b>7</b>

### Year 2 – Semester 2

Course Code	Course Title (English)	Course Title (Arabic)	Pre-Requested	Th	Pr	Tut	Total C.H.
CVS 608	Vascular Surgery	جراحة الأوعية الدموية	CVS 603	2	1	0	3
CVS 609	Cardiopulmonary Bypass and ICU Management	دورة القلب والرئة والعناية المركزة	CVS 602	2	1	0	3
<b>Total Credit Hours – Semester 4</b>							<b>6</b>

**Note:** By the end of Year 2, students are required to prepare and submit **two scientific research papers** for publication in peer-reviewed medical journals, as part of their research training and academic development

### Year 3 – Semester 1

Course Code	Course Title (English)	Course Title (Arabic)	Pre-Requested	Th	Pr	Tut	Total C.H.
CVS 610	Minimally Invasive & Robotic Surgery	الجراحة طفيفة التوغل والجراحة الروبوتية	CVS 606	1	1	0	2
CVS 611	Emergency Cardiovascular Surgery	جراحة القلب الطارئة	CVS 606	2	1	0	3
	<b>Total Credit Hours – Semester 5</b>						<b>5</b>

### Year 3 – Semester 2

Course Code	Course Title (English)	Course Title (Arabic)	Pre-Requested	Th	Pr	Tut	Total C.H.
CVS 612	Advanced Cardiovascular Imaging	التصوير المتقدم للقلب والأوعية	CVS 602	1	1	0	2
CVS 613	Ethical and Legal Issues in Cardiovascular Surgery	القضايا الأخلاقية والقانونية في الجراحة القلبية	None	2	0	0	2
	<b>Total Credit Hours – Semester 6</b>						<b>4</b>

### Year 4 – Semester 1

Course Code	Course Title (English)	Course Title (Arabic)	Pre-Requested	Th	Pr	Tut	Total C.H.
CVS 614	Clinical Cardiovascular Surgery Practicum	التطبيق السريري في جراحة القلب والأوعية	CVS 606–613	0	6	0	6
	<b>Total Credit Hours – Semester 7</b>						<b>6</b>

### Year 5 – Full Year

Course Code	Course Title (English)	Course Title (Arabic)	Credit Hours
CVS 700	MD Thesis in Cardiovascular Surgery	رسالة الدكتوراة في جراحة القلب والأوعية	6

✓ **Total Credit Hours Required for Graduation: 49**

## Graduation Requirements

To be eligible for graduation, students must:

- Successfully complete all required courses (core and clinical) and earn at least **43 credit hours**.
- Complete and defend a **thesis** worth **6 credit hours**.
- Achieve a **minimum passing grade** in each course as per university regulations.
- Maintain an **overall GPA of at least 2.5 out of 4.0 or 75%**.
- Fulfill all **clinical practicum hours and logbook requirements**.

## Resources and Equipment

To ensure quality delivery of the MD Cardiovascular Surgery program, the following resources are required:

- Well-equipped **surgical skill labs and operating theaters**.
- **Cardiac simulation units** and mannequins for minimally invasive training.
- **Advanced diagnostic imaging facilities** (echocardiography, CT, MRI).
- Access to **cardiovascular surgery ICUs and inpatient units**.
- Medical libraries with **online journal access and databases**.
- IT infrastructure to support **e-learning and research tools**.

## Faculty and Staff Requirements

Academic Rank	Required	Available	Notes
Professors	2	TBD	At least 1 specialist in CV surgery
Associate Professors	3	TBD	Includes vascular and pediatric focus
Assistant Professors	4	TBD	Must include ICU and imaging expertise
Teaching Assistants	4	TBD	Support in clinical rotations and labs

## Program Evaluation and Improvement

Target Group	Evaluation Method	Sample Type
Students	Course feedback surveys	All enrolled students
Faculty	Peer reviews, academic audits	All teaching staff
Alumni	Graduate tracer studies	Selected graduates from past 3 years
Employers	Structured feedback forms/interviews	Hospitals, health institutions
Curriculum Committee	Annual program review meetings	Committee members