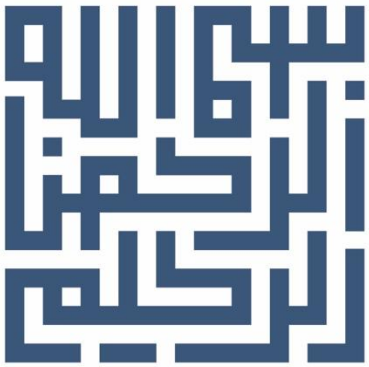
جامعة الإمام عبد الرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY
كلية العلوم الطبية التطبيقية
College of Applied Medical Sciences

Department of Cardiac Technology

Program Handbook

2025 - 2026

2025-2026



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MESSAGE FROM THE HEAD OF CT DEPARTMENT

Dear Students,

It is with great pleasure that I welcome you to the Department of Cardiac Technology at Imam Abdulrahman Bin Faisal University. You are joining a program that is committed to academic excellence, professional integrity, and the advancement of cardiovascular health care through education, research, and community service.

Our vision is to be a leading program of academic distinction in cardiac technology education and research at both the national and international levels. In line with this vision, our mission is to graduate competent cardiac technologists equipped with evidence-based knowledge and clinical skills, empowered with innovative research capabilities, and committed to effective community service, while upholding the highest ethical values of the profession.

As you undertake this academic journey, you will be encouraged to engage actively in your studies, apply critical thinking in practice, and embrace opportunities for research and professional growth. The department's faculty and staff are dedicated to supporting your development and ensuring that you are well prepared to meet the demands of a dynamic and evolving health care environment.

I invite you to approach this year with dedication, curiosity, and a strong sense of responsibility toward yourself, your patients, and your community.

Together, we will continue to build on the department's achievements and contribute to the progress of cardiovascular medicine.

I wish you every success in your academic and professional journey.

With sincere regards,

Dr. Abrar Ibrahim Alnaimi
Assistant Professor of Cardiovascular Sciences
Head of the Department of Cardiac Technology
College of Applied Medical Sciences, Imam Abdulrahman Bin Faisal University

INTRODUCTION

Cardiac technology is an allied health profession specifically focused on the diagnosis to assist in the management of patients with cardiovascular disease. Cardiac Technology Specialists are highly skilled professionals qualified to provide patient care using diagnostic (Echo) technology, assisting with cardiac catheterization either diagnostically or through intervention, or by managing cardiac perfusion in open-heart surgery.

The Cardiac Technology program at Imam Abdulrahman bin Faisal University, College of Applied Medical Sciences (CAMS) was **established during the academic year 2008-2009**. The program duration is four years, including the preparatory year, and is followed by an internship year in a variety of approved hospitals.

CT DEPARTMENT HEADS

- Dr. Abdullah Alshehri (2009-2015)
- Prof. Akram Alkhadra'a (2015-2018)
- Dr. Mousa Alharbi (2018-2020)
- Dr. Ahmed Sabry (2020-2021)
- Dr. Hussam Abdualeem (2021-2022)
- Dr. Lamia Al Saikhan (2022-2025)
- Dr. Abrar Alnaimi (2025-present)

OUR VISION

A leading program of academic excellence for cardiac technology education and research nationally and internationally.

OUR MISSION

Graduate cardiac technologists who are competent in evidence-based knowledge and practice, innovative research skills, and effective community service compatible with the best ethical values of the profession.

PROGRAM GOALS

- Provide quality education and continuously improve the learning standards with the best clinical experience.
- Graduate qualified cardiac technologists of national and international standards to fulfil labor markets' needs.
- Promote scientific research in the field of cardiac technology.
- Maintain effective community service and partnership.

PROGRAM VALUES

- Excellence
- Loyalty
- Teamwork
- Initiative
- Responsibility
- Transparency
- Creativity

CURRENT FACULTY AND STAFF

Name	Grade	Academic Degree	E-mail	Extension
Chairperson				
Dr Abrar Alnaimi	Assistant professor	Doctorate	aialnaimi@iau.edu.sa	013-3335235
Department Coordinator				
Dr Mostafa Rashed	Assistant professor	Doctorate	mhrashed@iau.edu.sa	013-3331218
Dr. Mohammed Yahia	professor	Doctorate	myabdullah@iau.edu.sa	-
Dr Ghadah Soltan	Associate Professor	Doctorate	gmsultan@iau.edu.sa	013-3331230
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Mrs Helah Alyahya	Technician	Bachelor	hyalyahya@iau.edu.sa	013-3331372
Mrs Amal Almussa	Secretary	Bachelor	amalmussa@iau.edu.sa	013-3331315

Faculty (Graduated from the program and studying abroad)

- Ms. Sara Alsubaie (2018-present)
- Ms. Foziyah Alqahtani (2018-present
- Ms. Lamis Alghamdi (2019-present)
- Ms. Raghad Alraimi (2019-present)

CARDIAC TECHNOLOGY CURRICULUM

INVASIVE TECHNOLOGIST (CARDIAC CATHETERIZATION) TRACK

Course Title	Code	Pre-Requisites	Year/Term
Level 3: Major Courses – 16 Credit Hours			
History & civilization of Kingdom of Saudi Arabia	HIST-281	-	Second Year First Term
Entrepreneurship	BUS-381	-	
Cardiovascular Physiology	PHYL-201	BIOL-108	
Cardiovascular Anatomy	ANAT-202	BIOL-108	
Microbiology and Infection control	MICRO-203	BIOL-108	
Health Informations	HIMT-204	-	
Level 4: Major Courses – 16 Credit Hours			
Islamic Ethics and Values	ISLM-282	-	Second Year Second Term
Medical Biochemistry	BIOCH-208	CHEM-109	
Cardiac Pathology	PATH-210	PHYL-201 ANAT-202	
Introduction to Cardiovascular Technology	CTECH-211	PHYL-201 ANAT-202	
Applied Physics for Cardiac Technology	PHYS-212	PHYS-106	
Level 5: Major Courses – 17 Credit Hours			
Cardiovascular Hemodynamics	CTECH-301	PHYL-201	Third Year First Term
Basic Echocardiography	CTECH-302	PATH-210	

		CTECH-211	
Electrocardiogram I	CTECH-303	CTECH-211	
Nursing Skills	NURS-304	CTECH-211	
Applied Biostatistics	STAT-305	COMP-107	
Behavioral Science	PSYCO-214	-	
Level 6: Major Courses – 17 Credit Hours			
Basic Cardiac Catheterization	CTECH-311	CTECH-211 PHYS-212	Third Year Second Term
Basic Cardiac Perfusion	CTECH-312	CTECH-211	
Cardiovascular Pharmacology	PHARM-313	PHYL-201	
Medical Ethics and Law	CTECH-314	-	
Research Methodology	RESM-315	STAT-305	
Level 7: Major Courses – 14 + 3 IP Credit Hours			
Electrocardiogram 2	CTECH-401	CTECH-303	Fourth Year First Term
Graduation Research Project	CTECH-402	RESM-315	
Advanced Cardiac Catheterization 1	CTECH-406	CTECH-311	
Clinical Practice on Cardiac Catheterization1	CTECH-407	CTECH-311	
Basic and Advanced Cardiac Life Support	CTECH-405	CTECH-303	
Level 8: Major Courses – 18 Credit Hours			
Graduation Research Project	CTECH-402	RESM-315	Fourth Year Second Term
ECG Interpretation	CTECH-411	CTECH-401	
Cardiac Catheterization Interpretation	CTECH-416	CTECH-406	
Advanced Cardiac Catheterization 2	CTECH-417	CTECH-406	
Pediatric Cardiac Catheterization	CTECH-418	CTECH-406	

Clinical Practice on Cardiac catheterization 2	CTECH-419	CTECH-406	

INVASIVE TECHNOLOGIST (CARDIAC PERFUSION) TRACK

Course Title	Code	Pre-Requisites	Year/Term
Level 3: Major Courses – 16 Credit Hours			
History & civilization of Kingdom of Saudi Arabia	HIST-281	-	Second Year First Term
Entrepreneurship	BUS-381	-	
Cardiovascular Physiology	PHYL-201	BIOL-108	
Cardiovascular Anatomy	ANAT-202	BIOL-108	
Microbiology and Infection control	MICRO-203	BIOL-108	
Health Informations	HIMT-204	-	
Level 4: Major Courses – 16 Credit Hours			
Islamic Ethics and Values	ISLM-282	-	Second Year Second Term
Medical Biochemistry	BIOCH-208	CHEM-109	
Cardiac Pathology	PATH-210	PHYL-201 ANAT-202	
Introduction to Cardiovascular Technology	CTECH-211	PHYL-201 ANAT-202	
Applied Physics for Cardiac Technology	PHYS-212	PHYS-106	
Level 5: Major Courses – 17 Credit Hours			
Cardiovascular Hemodynamics	CTECH-301	PHYL-201	Third Year First Term
Basic Echocardiography	CTECH-302	PATH-210	

		CTECH-211	
Electrocardiogram I	CTECH-303	CTECH-211	
Nursing Skills	NURS-304	CTECH-211	
Applied Biostatistics	STAT-305	COMP-107	
Behavioral Science	PSYCO-214	-	
Level 6: Major Courses – 17 Credit Hours			
Basic Cardiac Catheterization	CTECH-311	CTECH-211 PHYS-212	Third Year Second Term
Basic Cardiac Perfusion	CTECH-312	CTECH-211	
Cardiovascular Pharmacology	PHARM-313	PHYL-201	
Medical Ethics and Law	CTECH-314	-	
Research Methodology	RESM-315	STAT-305	
Level 7: Major Courses – 14 + 3 IP Credit Hours			
Electrocardiogram 2	CTECH-401	CTECH-303	Fourth Year First Term
Graduation Research Project	CTECH-402	RESM-315	
Advanced Cardiac Perfusion1	CTECH-408	CTECH-312	
Clinical Practice on Cardiac Perfusion 1	CTECH-409	CTECH-312	
Basic and Advanced Cardiac Life Support	CTECH-405	CTECH-303	
Level 8: Major Courses – 18 Credit Hours			
Graduation Research Project	CTECH-402	RESM-315	Fourth Year Second Term
ECG Interpretation	CTECH-411	CTECH-401	
Cardiac Perfusion Interpretation	CTECH-420	CTECH-408	
Advanced Cardiac Perfusion 2	CTECH-421	CTECH-408	
Pediatric Cardiac Perfusion	CTECH-422	CTECH-408	
Clinical Practice on Cardiac Perfusion 2	CTECH-423	CTECH-408	

NON-INVASIVE TECHNOLOGIST (ECHOCARDIOGRAPHY) TRACK

Course Title	Code	Pre-Requisites	Year/Term
Level 3: Major Courses – 16 Credit Hours			
History & civilization of Kingdom of Saudi Arabia	HIST-281	-	Second Year First Term
Entrepreneurship	BUS-381	-	
Cardiovascular Physiology	PHYL-201	BIOL-108	
Cardiovascular Anatomy	ANAT-202	BIOL-108	
Microbiology and Infection control	MICRO-203	BIOL-108	
Health Informations	HIMT-204	-	
Level 4: Major Courses – 16 Credit Hours			
Islamic Ethics and Values	ISLM-282	-	Second Year Second Term
Medical Biochemistry	BIOCH-208	CHEM-109	
Cardiac Pathology	PATH-210	PHYL-201 ANAT-202	
Introduction to Cardiovascular Technology	CTECH-211	PHYL-201 ANAT-202	
Applied Physics for Cardiac Technology	PHYS-212	PHYS-106	
Level 5: Major Courses – 17 Credit Hours			
Cardiovascular Hemodynamics	CTECH-301	PHYL-201	Third Year First Term
Basic Echocardiography	CTECH-302	PATH-210 CTECH-211	
Electrocardiogram I	CTECH-303	CTECH-211	

Nursing Skills	NURS-304	CTECH-211	
Applied Biostatistics	STAT-305	COMP-107	
Behavioral Science	PSYCO-214	-	
Level 6: Major Courses – 17 Credit Hours			
Basic Cardiac Catheterization	CTECH-311	CTECH-211 PHYS-212	Third Year Second Term
Basic Cardiac Perfusion	CTECH-312	CTECH-211	
Cardiovascular Pharmacology	PHARM-313	PHYL-201	
Medical Ethics and Law	CTECH-314	-	
Research Methodology	RESM-315	STAT-305	
Level 7: Major Courses – 14 + 3 IP Credit Hours			
Electrocardiogram 2	CTECH-401	CTECH-303	Fourth Year First Term
Graduation Research Project	CTECH-402	RESM-315	
Advanced Adult Echocardiography 1	CTECH-403	CTECH-302	
Clinical Practice on Echocardiography 1	CTECH-404	CTECH-302	
Basic and Advanced Cardiac Life Support	CTECH-405	CTECH-303	
Level 8: Major Courses – 18 Credit Hours			
Graduation Research Project	CTECH-402	RESM-315	Fourth Year Second Term
ECG Interpretation	CTECH-411	CTECH-401	
Echocardiography Interpretation	CTECH-412	CTECH-403	
Advanced Adult Echocardiography 2	CTECH-413	CTECH-403	
Pediatric Echocardiography	CTECH-414	CTECH-403	
Clinical Practice on Echocardiography 2	CTECH-415	CTECH-403	

COURSE DESCRIPTION

Course Title and Code	Course Description
History & civilization of Kingdom of Saudi Arabia (HIST-281)	Aimed to review the historical and civilizational aspects of the Kingdom of Saudi Arabia and its cultural heritage, and the efforts of its rulers in building the political and civilized state and their role in serving Arab, Islamic, and humanitarian issues, and achieving Vision 2030 in the field of tourism and national heritage.
Entrepreneurship (BUS-381)	Introductory to the creative and innovative managerial practices of successful entrepreneurship. This course reviews the significant economic and social contributions of entrepreneurs that provides the society with the skills necessary for entrepreneurial success.
Cardiovascular Physiology (PHYL-201)	Discussed the fundamental concepts of cardiovascular physiology including characters of cardiac muscle, and cardiac cycle as well as different regulatory mechanisms required to maintain normal cardiac output and arterial blood pressure.
Cardiovascular Anatomy (ANAT-202)	Concerned with a detailed study of cardiovascular anatomy and a basic study of cardiac embryology with a review study of general anatomy.
Microbiology and Infection control (MICRO-203)	Aimed to study different types of microorganism and its relation to healthcare -associated infection and hospital-associated infection.
Health Informations (HIMT-204)	Designed to teach students the basic systems that capture, store, manage or transmit information related to health care individuals.
Islamic Ethics and Values (ISLM-282)	Deals with virtuous morals, values, practical ethics and their legal rooting in the Qur'an and Sunnah, the determinant of instinct and instinct, moderation and community identity, and related skill and applied activities.
Medical Biochemistry (BIOCH-208)	Designed to study the chemical process in a molecular basis and its relation to the human being.

Applied Pathology for Heart Diseases (PATH-210)	Described the pathology and pathophysiological mechanisms of different cardiovascular diseases.
Introduction to Cardiovascular Technology (CTECH-211)	Introductory to the basic sciences of cardiac technology, including basic concepts and terminology, equipment of ECG, Echocardiography, Catheterization, and Perfusion.
Applied Physics for Cardiac Technology (PHYS-212)	Concerned with a brief review of concepts of classic physics, detailed study of waves properties and selected reviews of some modern physics topics.
Cardiovascular Hemodynamics (CTECH-301)	Enabled students to use the essential methods of hemodynamic assessment in the cardiac catheterization laboratory to understand the physiology and pathophysiology of patients with cardiovascular diseases.
Basic Echocardiography (CTECH-302)	Enabled students to do basic echocardiography through training on simulators and real patients.
Electrocardiogram I (CTECH-303)	Focused on acquiring basic theoretical and practical concepts of electrocardiogram, correct leads placement, review electrical conduction of the heart and basic ECG interpretation skills.
Nursing Skills (NURS-304)	Focused on gaining proficiency in clinical assessment of patients and apply the therapeutic communication skills and critical decision-making skills in analyzing the data obtained through the history taking and examination. Designed to develop competency in management and care of clinical problems identified for the client.
Applied Biostatistics (STAT-305)	Enabled students to apply statistics to a wide range of topics related to health care by using computer-based software.
Behaviour Sciences (PSYCO-214)	Study of human habits, actions, and intentions through combining knowledge of psychology with strong observation, research, and communication skills.
Basic Catheterization (CTECH-311)	Aimed at gaining basic theoretical and practical concepts of cardiac catheterization procedures, exposing students to deal with Cath lab equipment, understand principles of sterilization, cardiac catheterization views, indications and contraindications, vascular access, and left heart catheterization techniques.
Basic Cardiac Perfusion (CTECH-312)	Aimed to acquire basic theoretical knowledge and practical application of cardiac perfusion, equipment and supplies utilized in open heart surgeries. Also, sterilization and infection control principles, patient assessment pre and post CABG surgeries. with emphasis on the basics of hemodynamic monitoring of patients.

Cardiovascular Pharmacology (PHARM-313)	Discussed basic concepts pf pharmacology as well as detailed pharmacotherapeutics, pharmacodynamics and pharmacokinetics of different drugs affecting the cardiovascular system.
Research Methodology (RESM-315)	Designed to enable students to understand the basic skeleton of research and how to write a proposal and conduct research projects.
Electrocardiogram 2 (CTECH-401)	By the end of this course the students will be able to perform and interpret 12 leads ECG, Exercise stress test and Holter monitoring.
Graduation Research Project (CTECH-402)	Aimed to organize and collect DATA in a scientific manner, that will prepare them to practice different types of health research, and to be enabled to conduct scientific research appropriately.
Advanced Adult Echocardiography I (CTECH-403) (Echo subspecialty)	Discussed the role of echocardiography in diagnosis, and severity assessment of different cardiovascular diseases.
Advanced Cardiac Catheterization 1 (CTECH-406) (Cath subspecialty)	Enabled students to learn the theoretical and applied concepts of cardiac catheterization with information about right and left diagnostic angiography.
Advanced Cardiac Perfusion 1 (CTECH-408) (Cardiac Prefusion subspecialty)	Aimed to acquire advanced theoretical knowledge and practical application of cardiac perfusion techniques, equipment and supplies that will be utilized in open heart surgeries. Different cannulation techniques and adjusted doses of heparin and its antidot.
Clinical Practice on Echocardiography1 (CTECH-404) (Echo subspecialty)	In-hospital round including exposure of students to a practical performance and observation of Transthoracic Echo, resting ECG, Stress ECG, and Holter Monitoring.
Clinical Practice on Cardiac Catheterization 1 (CTECH-407) (Cath subspecialty)	In-hospital round including exposure of students to learn essential clinical skills through a practical performance and observation of resting ECG, Stress ECG, Holter Monitoring and Cardiac Catheterization.

Clinical Practice on Cardiac Perfusion 1 (CTECH-409) (Cardiac Perfusion subspecialty)	In-hospital round enable students to pursue the theoretical knowledge and practical skills of basic and advanced cardiac perfusion, with emphasis on patient preparation, safety measures, hemodynamic calculations and equipment installation in open heart surgery room.
Basic and Advanced Cardiac Life Support (CTECH-405)	Concerned with theoretical and practical application of basic and advanced life support and cardiopulmonary resuscitation in cardiac arrest.
ECG interpretation (CTECH-411)	Tutorial based course focused on review and interpret ECG abnormalities as well as exercise and Holter.
Echocardiography interpretation (CTECH-412) (Echo subspecialty)	Tutorial-based course enabled students to gain the needed skills for echocardiography interpretation through discussing cases with instructor either in class lectures or in echo-machines in the lab.
Cardiac catheterization interpretation (CTECH-416) (Cath subspecialty)	Tutorial-based course and group discussion in which students will discuss with their instructor how to interpret diagnostic Coronary Angiography, Interventional Adult Cardiac Catheterization, Basic Pediatric Cardiac Catheterization and Cardiovascular Hemodynamic.
Cardiac Perfusion interpretation (CTECH-420) (Cardiac Perfusion subspecialty)	Tutorial-based course enabled students to practical training of interpretation of different Cardiac perfusion case scenarios, including different clinical situations in operative room.
Advanced adult echocardiography 2 (CTECH-413) (Echo subspecialty)	Focused on Stress Echocardiography, and Trans-esophageal Echocardiography, indications, contraindications, precautions, and interpretation.
Advanced cardiac catheterization 2 (CTECH- 417) (Cath subspecialty)	Electrophysiology course aimed to enable students to understand the mechanisms of different types of cardiac arrhythmias and associated conditions like syncope and to understand the intra cardiac ECG. The course deals with trance catheter ablation of accessory pathways and helps to understand the pacemaker system.
Advanced cardiac perfusion 2 (CTECH- 421)	Aimed to acquire advanced theoretical knowledge and practical application of cardiac perfusion techniques, Pathophysiology of Perfusion and cardiopulmonary bypass machine, Including CNS, CVS

(Cardiac Perfusion subspecialty)	and myocardial protection, also, blood management, respiratory function, fluid and electrolyte balance during bypass.
Paediatric Echocardiography (CTECH-414) (Echo subspecialty)	Focused on the role of echocardiography in assessment of congenital heart diseases in pediatrics and adults.
Paediatric cardiac catheterization (CTECH-418) (Cath subspecialty)	Enabled students to understand the role of cardiac technologists in pediatric catheterization laboratories.
Paediatric cardiac perfusion (CTECH-422) (Cardiac Perfusion subspecialty)	Aimed to pursue a theoretical and practical simulation study of the role of the Cardiac perfusionist in a various of invasive cardiac procedures such as surgical correction of congenital heart defects, Priming in pediatric patients, Fluid, and electrolyte balance in pediatric age group.
Clinical Practice on Echocardiography 2 (CTECH-415) (Echo subspecialty)	In-hospital round to enable students to practice and observe Transthoracic, Transesophageal, and Stress Echocardiography.
Clinical Practice on Cardiac catheterization 2 (CTECH-419) (Cath subspecialty)	In-hospital round course during which students can assist cardiologist in Cath lab and assist in different types of basic and interventional adult and pediatric cardiac catheterization.
Clinical Practice on Cardiac Perfusion 2 (CTECH-423) (Cardiac Perfusion subspecialty)	In-hospital round enable students to apply the theoretical knowledge and practice their skills of basic and advanced cardiac perfusion, with emphasis on equipment preparation, patient preparation, safety measures, hemodynamic calculations in open heart surgery room.
Total Credit Hours is 129	

Fifth year (Internship)

After completing the previous curriculum, students spend 12 months of focused training in cardiac technology field (internship) at approved hospitals. After successful completion of this year, students are graduated with a certificate that allows them to start a career as a cardiac technology specialist.

ADMISSION TO CARDIAC TECHNOLOGY PROGRAM

Students join the Cardiac Technology program after successfully passing the health track of the preparatory year studies at the university. The selection process follows the IAU guidelines which include the choice of students, the GPA and the availability of seats allocated within the capacity of the Cardiac Technology Department.

SELECTION OF SUB-SPECIALITY

Cardiac Technology program offers three subspecialities: Echocardiography, Cardiac Catheterization and Cardiac Perfusion. CT students share the same academic study plan and learning outcomes that includes Basic Echocardiography, Basic Cardiac Catheterization and Basic Cardiac Perfusion. By the end of 3rd year, students are knowledgeable of the basic concepts of the specialties and are well prepared to choose between them. In the 4th year, students must be enrolled in one of the three subspecialities to include the advanced courses in their study plan.

The selection policy of the department is applied at the end of each academic year to have a balanced distribution of 3rd year students who are divided between the three subspecialities in their 4th year of study, taking into consideration the update in market demands and the up-to-date stakeholders' recommendations.

Policy Statement

1. An orientation program on selection of subspeciality is organized by the program coordinator and conducted to 3rd year students each year as an interactive session. It includes an introduction to the subspecialties offered within the program, and the role of cardiac technologists in Echocardiography, Cardiac Catheterization and Cardiac Perfusion in addition to the potential future career opportunities. During the orientation program, students are informed about the selection criteria with the

student preference being the most important factor. The faculty members welcome any questions and are ready to answer all questions and/or concerns the students may have.

2. Within one week of the orientation program, students are requested to make a decision choosing the preferred specialty through a google form link sent by the program coordinator.

3. The list of students' preference is then reviewed for approval.

4. The department prefers to have a balanced distribution of students in subspecialities, taking into consideration the capacity of clinical training sites, market demands, and the up-to-date stakeholders' recommendations. Students' preferences are expected to be distributed according to the one of the following:

4.1. A balanced distribution, that will be directly accepted and approved.

4.2. An unbalanced distribution, that can be divided into three possibilities.

A. If the preference of students is more towards Echocardiography, the GPA and the midterm grades of the basic Echocardiography course are reviewed as criteria for selection.
B. If the preference of students is more towards Cardiac Catheterization, the GPA, and the midterm grades of the basic Cardiac Catheterization, and Cardiovascular Hemodynamics courses are reviewed as criteria for selection.
C. If the preference of students is more towards Cardiac Perfusion, the GPA and the midterm grades of the basic Cardiac Perfusion course are reviewed as criteria for selection.
D. **5.** The final approved list of students' distribution is then announced to all students with their selected subspeciality by the program coordinator via a department email.

PROGRAM LEARNING OUTCOMES

Track A: Echocardiography	
Knowledge and understanding	
K1	Describe the fundamentals of cardiovascular and other related sciences.
K2	Recall the principles and procedures of Electrocardiogram, Echocardiogram, basic Cardiac catheterization, and basic Cardiac Perfusion.
K3	Recognize the concepts of research methodology, medical ethics, and legal considerations of healthcare within the spectrum of Cardiac Technology profession.
Skills	
S1	Demonstrate the principles of Electrocardiogram, Echocardiography, basic Cardiac Perfusion and basic Cardiac catheterization procedures to practice safely and effectively.
S2	Assess accurately cardiac structure, function, and abnormal valvular findings in Echocardiography.
S3	Develop skills in obtaining non-invasive and basic invasive cardiac techniques through calibrating and manipulating instruments and drugs.
S4	Apply critical thinking on echocardiography-related statistical data to conceive research ideas.
S5	Show effectively the use of information technology and communication skills in professional settings.
Values, Autonomy, and Responsibility	
V1	Show responsibility towards teamwork and self-learning for continuous professional development.
V2	Demonstrate ethical and professional conduct within the scope of Cardiac Technology profession that is consistent with the Islamic values.

Track B: Cardiac Catheterization	
Knowledge and understanding	
K1	Describe the fundamentals of cardiovascular and other related sciences.
K2	Recall the principles and procedures of Electrocardiogram, Cardiac catheterization, basic Echocardiogram, and basic Cardiac Perfusion.
K3	Recognize the concepts of research methodology, medical ethics, and legal considerations of healthcare within the spectrum of Cardiac Technology profession.
Skills	
S1	Demonstrate the principles of Electrocardiogram, Cardiac catheterization, basic Cardiac Perfusion, and basic Echocardiogram procedures to practice safely and effectively.
S2	Interpret accurately coronary lesions and hemodynamic findings in Cardiac catheterization.
S3	Develop skills in obtaining invasive and basic non-invasive cardiac techniques through calibrating and manipulating instruments and drugs.
S4	Apply critical thinking on Cardiac catheterization-related statistical data to conceive research ideas.
S5	Show effectively the use of information technology and communication skills in professional settings.
Values, Autonomy, and Responsibility	
V1	Show responsibility towards teamwork and self-learning for continuous professional development.
V2	Demonstrate ethical and professional conduct within the scope of Cardiac Technology profession that is consistent with the Islamic values.

Track C: Cardiac Perfusion	
Knowledge and understanding	
K1	Describe the fundamentals of cardiovascular and other related sciences.
K2	Recall the principles and procedures of Electrocardiogram, Cardiac Perfusion, and basic Cardiac catheterization, and basic Echocardiogram.
K3	Recognize the concepts of research methodology, medical ethics, and legal considerations of healthcare within the spectrum of Cardiac Technology profession.
Skills	
S1	Demonstrate the principles of Electrocardiogram, Cardiac Perfusion, basic Cardiac catheterization, and basic Echocardiogram procedures to practice safely and effectively.
S2	Evaluate accurately hemodynamic findings and arterial blood gases in operation room.
S3	Develop skills in obtaining invasive and basic non-invasive cardiac techniques through calibrating and manipulating instruments and drugs.
S4	Apply critical thinking on Cardiac perfusion-related statistical data to conceive research ideas.
S5	Show effectively the use of information technology and communication skills in professional settings.
Values, Autonomy, and Responsibility	
V1	Show responsibility towards teamwork and self-learning for continuous professional development.
V2	Demonstrate ethical and professional conduct within the scope of Cardiac Technology profession that is consistent with the Islamic values.

GENERAL ROLE OF A CARDIAC TECHNOLOGIST IN PRACTICE

- Perform resting ECG, stress ECG, 24H Holter monitoring, and 24H blood pressure monitoring.
- Monitor patients' vital signs and hemodynamics.
- Schedule appointments.
- Explain test procedures to patients and record any additional medical history.
- Operate and care for testing and adjusting the equipment.

ROLE OF A CARDIAC TECHNOLOGIST IN CARDIAC CATHETERIZATION

- Assist invasive cardiologists in performing diagnostic and interventional cardiac catheterization procedures.
- Prepare patients for cardiac catheterization and assist interventionalists as scrubbing assistant, by sterilizing the area around the puncture site, and preparing Cath table with the necessary tools and medications.
- Closely monitor and record patients' blood pressure and heart rhythm with special hemodynamic monitoring equipment during the invasive procedures and notify the physician about any hemodynamic changes noted.
- Assist in obtaining angiographic views, performing physiological and anatomical assessment to reach diagnosis and plan intervention if needed.
- Write a preliminary report of the angiographic findings and interventional data.
- Assist in programing pacemakers and implanted devices for optimal function under the supervision of the attending cardiologist.
- Perform pressure measurements by applying specific equations in right heart catheterization.

ROLE OF A CARDIAC TECHNOLOGIST IN CARDIAC PERFUSION

- Assist physicians in diagnosing and treating cardiac and vascular ailments.
- Operating and selecting different extracorporeal circulation equipment, including the heart-lung machine, artificial heart, blood transfusion devices, intra-aortic balloon pump, and ventricular-assist devices.
- Monitoring and managing the patient's care during surgery to ensure their physiological functions are safe.
- Administering various types of blood products and medications to patients as part of the standard procedure during surgery.
- Performing various administrative responsibilities such as equipment management, purchasing supplies, managing the department, and implementing quality improvement measures.

ROLE OF A CARDIAC TECHNOLOGIST IN ECHOCARDIOGRAPHY

- Obtain basic and advanced heart structure and function parameters relevant to patients' pathological condition.
- Evaluate the findings to identify and grade the severity of a spectrum of heart diseases.
- Write a preliminary report of the heart structure and function.
- Select appropriate equipment settings and changing the patient's position as necessary.
- Assist cardiologists in performing stress and transesophageal echocardiography procedures.

GRADUATE ATTRIBUTES

1. **Deep knowledge and intellectual breadth**

Graduates have comprehensive knowledge and understanding of the field of cardiac technology and have the ability to apply their knowledge in practice including in multi-disciplinary and/or multi-professional contexts.

2. **Critical thinking and problem solving**

Graduates are effective problem-solvers, able to apply critical and creative thinking to conceive innovative research ideas and responses to challenges.

3. **Teamwork and communication skills**

Graduates convey ideas and information effectively to a range of audiences for a variety of purposes and contribute in a positive and collaborative manner to achieving common goals.

4. **Professionalism and leadership readiness**

Graduates engage in a professional behavior and have the responsibility for continuous professional development and have the potential to take leadership roles in their chosen careers and communities.

5. **Intercultural and ethical competency**

Graduates are responsible and accountable citizens whose personal values and practices are consistent with the Islamic identity and values as responsible members of the society.

6. **Digital capabilities**

Graduates are well prepared for living, learning, and working in a digital society.

7. **Self-awareness and emotional intelligence**

Graduates are self-aware and reflective, flexible and resilient, and have the capacity to accept and give constructive feedback, being able to act with integrity and take responsibility for their actions.

CAREER OPPORTUNITIES FOR CARDIAC TECHNOLOGY GRADUATES

There is an increasing demand for cardiac technology graduates in hospitals and cardiac centers across the Kingdom. The career path for our graduates goes even beyond working only in health sector. Industry and Medical Device Innovation are promising and growing sectors where our graduates can have opportunities for employment. Education and Academia sector is also a potential career path especially for the highly talented graduates. Lastly, engagement in research and postgraduate programs can also play a role in enhancing our graduate's employability.

ACHIVEMENTS

Faculty

- **Dr. Lamia Al Saikhan** won multiple international awards including:
    - 1st Rank Winner of Dr Soliman Fakeeh Award (Medical Research Track) – **2024**.
    - Awarded an Honorary Research Fellow position from UCL (University College London) and invited for a UCL summer visit 2022-2023.
    - 2021 Young Investigators Award, British and Irish Hypertension Society Annual Meeting, UK – 2021
    - 3rd Place Young Investigator Award, Artery 2019 Conference, Hungry – 2019
    - Best of the Best Clinical (Imaging) Abstract Award, British Cardiovascular Society Annual Conference, UK – 2019
    - Awardee of the Certificate of Scientific Excellence from His Royal Highness Prince Muhammad bin Nawaf, the Saudi Arabia Ambassador in the UK – 2018.
    - Faculty of Medicine Dean's Prize for Medical Ultrasound (Echocardiography), Imperial College London, UK – 2017
- **Dr. Maryam Alsharqi** awarded the "MIT-KACST Ibn Khaldun Fellowship for Saudi Women" year 2023-2024.
- **Dr. Mustafa Rashed** won the CAMS Best Teacher Award during the academic year 2022-2023.
- **Dr. Ahmed Sabri** won the UD Teaching Excellence Award during the academic year 1433-1434 AH.

Department

- A **Memorandum of Agreement** with Johns Hopkins Aramco Healthcare (JAHA) Hospital –aimed at strategic cooperation in the fields of education, training, research, and community service – 2024-2025.
- A **Cooperation Agreement** with the Saudi German Hospital – Dammam aimed at strategic cooperation in the fields of education, training, research, and community service – 2023-2024.
- Distinction in Scientific Research Award with the highest rate of publications relative to the number of faculty within the department. This was at the level of the college being the best department among seven departments within the College of Applied Medical Science (CAMS) in research productivity for the academic year 2022-2023.

Students

- Rawan Aldulaijan won "درة الكلية" award, 2023 – 2024
- Ghada Alqahtani won "درة الكلية" award, 2022 – 2023

COMMUNITY SERVICES

As a part of the program's mission and goals, faculty, staff, and students are always empowered to participate in a variety of community service activities. Our program conducted a number of workshops, awareness campaigns, and educational sessions inside the university as well as in collaboration with external institutions including schools and charities.

For Further information about the program, you can visit the program website by scanning the QR code below:

Or contact us via our twitter page: @IAUCT.

For detailed program information, please contact CT chairperson.

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