

PROGRAM OUTCOME (POs)

Course Code	M.Sc.CARDIAC CARE TECHNOLOGY
PO1	Knowledge and skill: Nurture the scientific and/or clinical knowledge and skills for development of industrial applications, health care practices and entrepreneurship.
PO2	Critical Thinking & problem solving: Develop the ability of critical thinking to analyse, interpret problems and to find out systematic approach for solution.
PO3	Decision making: Impart decision making capability for handling various circumstances in their respective areas
PO4	Research skill: Demonstrate research skills for planning, designing, implementation and effective utilization of research findings for community.
PO5	Individual and team work: Develop an ability to function as an efficient individual and team player in multidisciplinary sectors for effective outcomes
PO6	Communication skills: Demonstrate an effective written and oral communication skills to communicate effectively in health care sector, industries, academia and research.
PO7	Code of ethics: Inculcate code of ethics in professional and social circumstances to execute them in daily practices and research in respective areas of specialization
PO8	Lifelong learning: Develop lifelong learning attitude and values for enhancement of professional and social skills for an overall development

PROGRAM SPECIFIC OUTCOME (SPOs)

SPO1	The course aims to provide students with the requisite clinical assessment, decision-making skills and management for a range of cardiology conditions and stroke including pharmacological and non-pharmacological therapeutic interventions.
SPO2	This course offers the opportunity to study all aspects of clinical cardiology including expert assessment and management of a range of cardiac conditions, cardiac interventions, interpretation and practical skills.
SPO3	Includes hyper acute stroke, thrombolysis, interpretation of cardiac CT and MRI, TIA management, maximising stroke care, rehabilitation and long term.
SPO4	The programme can be regarded as vital training for the early stages of cardiology or stroke specialist training with clear learning objectives.

Course Outcomes (COs)

Course Code	M.Sc.CARDIAC CARE TECHNOLOGY
SEMESTER I	
MCCT 101 T	Introduction to Clinical Cardiology
CO1	Student should Understand the Anatomy & Physiology of the Heart: Describe the structure, function, and conduction system of the heart. Identify common symptoms and examination techniques for cardiovascular diseases.
CO2	Cardiovascular Examination Techniques Students should Assess general and detailed physical appearance for signs of heart disease. Examine arterial pulses, jugular veins, and peripheral veins for diagnostic insights. Measure blood pressure and evaluate its physical determinants.
CO3	Students Analyze Cardiovascular Diagnostic Tests: Interpret ECG, echocardiography, cardiac catheterization, and stress testing results. Use chest roentgenograms (X-rays) to assess cardiac conditions.
CO4	To understand the role of Cardiac Care technologist while assisting the Cardiologist as well as when performing individually.
MCCT 102 T	Fundamentals of Cardiac Diagnostic Procedures and Investigations
CO1	To educate and train students to understand, interpret and complex diagnostic cardiac investigations.
CO2	Prepare for Emergencies in the Cardiac Cath Lab Identify major and minor complications during cardiac catheterization. Apply Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) algorithms in emergencies.
MCCT 103 T	Introduction to Pacing and Electrophysiology Study Techniques
CO1	Identify indications for cardiac pacing based on international guidelines
CO2	Identify indications for electrophysiological studies with/ without ablation in cases of complex arrhythmias.

CO3	Develop Expertise in Cardiac Pacing & Pacemaker Therapy Describe normal cardiac conduction and the need for pacing. Interpret NBB codes for pacemakers and their application. Differentiate indications for temporary vs. permanent pacing. Understand the components and functioning of pacemakers.
CC 001 T	Research Methodology & Biostatistics (Core Course)
CO1	Student will be able to understand develop statistical models, research designs with the understating of background theory of various commonly used statistical techniques as well as analysis, interpretation & reporting of results and use of statistical software.
MCCT 106 CP	MCCT Directed Clinical Education-I
CO1	Build a robust theoretical foundation, enabling students to understand healthare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.
CO 2	Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students' confidence and competence in delivering quality patient care.
CO 3	Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills—key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.
SEMESTER II	
MCCT 107 T	Introduction to Non-Invasive Techniques in Cardiology
CO1	Identify indications for non-invasive techniques based on international guidelines
CO2	Develop Expertise in non-invasive techniques.ECG,Echocardiography,Stess Test,
MCCT 108 T	Invasive Cardiology
CO1	To enable students to not only be a helping hand to those just starting out in the specialty but also to serve as a reference for those who have been working in Invasive field for some time
CO2	In-depth knowledge of cardiac diagnostic and interventional procedures, focusing on contrast media, intravascular imaging, coronary interventions, assist devices, peripheral angiography, and cardiac pharmacology.
MCCT 111 CP	MCCT Directed Clinical Education-II
CO1	Build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.
CO 2	Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students' confidence and competence in delivering quality patient care.
CO 3	Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills—key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.
SKILL EHANCEMENT COURSES	
SEC 001 T	Innovation and Enterprenuarship
CO1	Students will grasp the concepts of innovation, its ecosystem, and the role of various stakeholders such as government policies, startups, and innovation hubs.
CO2	Cultivating an entrepreneurial mindset and leadership qualities necessary for driving innovation and leading ventures.
CO3	Understanding the intersection of technology and innovation and leveraging emerging technologies for entrepreneurial ventures.
SEC 002 T	One Health (NPTEL)
CO1	A comprehensive understanding of One Health & role in global health challenges, emphasizing interconnectedness among human, animal, and environmental health.
CO2	Topics include research ethics, disease surveillance, and successes in controlling emerging infectious diseases.
CO3	Students explore disease emergence, transmission, antimicrobial resistance, and food safety, gaining insights into effective public health strategies.

CO PO Mapping
Program - M.Sc. Cardiac Care Technology
Semester I and II

PO1	Knowledge and skill: Nurture the scientific and/or clinical knowledge and skills for development of industrial applications, health care practices and entrepreneurship.
PO2	Critical Thinking & problem solving: Develop the ability of critical thinking to analyse, interpret problems and to find out systematic approach for solution.
PO3	Decision making: Impart decision making capability for handling various circumstances in their respective areas
PO4	Research skill: Demonstrate research skills for planning, designing, implementation and effective utilization of research findings for community.
PO5	Individual and team work: Develop an ability to function as an efficient individual and team player in multidisciplinary sectors for effective outcomes
PO6	Communication skills: Demonstrate an effective written and oral communication skills to communicate effectively in health care sector, industries, academia and research.
PO7	Code of ethics: Inculcate code of ethics in professional and social circumstances to execute them in daily practices and research in respective areas of specialization
PO8	Lifelong learning: Develop lifelong learning attitude and values for enhancement of professional and social skills for an overall development

PO Mapping same with correlation level 3,2,1 The notation of 1 - low, 2 - moderate, 3 - high

Semester	Course / Course Code	Course Outcome	Course Outcome Detail	Knowledge and skill	Critical Thinking & problem solving	Decision making	Research skill	Individual and team work	Communication skills	Code of ethics	Lifelong learning
				PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
Semester I	Introduction to Clinical Cardiology	CO1	Student should Understand the Anatomy & Physiology of the Heart: Describe the structure, function, and conduction system of the heart. Identify common symptoms and examination techniques for cardiovascular diseases.	3	3	3	1	3	3	2	3
		CO2	Cardiovascular Examination Techniques Students should Assess general and detailed physical appearance for signs of heart disease. Examine arterial pulses, jugular veins, and peripheral veins for diagnostic insights. Measure blood pressure and evaluate its physical determinants.	3	2	3	1	3	3	2	3
		CO3	Students Analyze Cardiovascular Diagnostic Tests: Interpret ECG, echocardiography, cardiac catheterization, and stress testing results. Use chest roentgenograms (X-rays) to assess cardiac conditions.	3	3	3	1	3	3	2	3
		CO4	To understand the role of Cardiac Care technologist while assisting the Cardiologist as well as when performing individually.	3	3	3	2	3	3	3	3
	Fundamentals of Cardiac Diagnostic Procedures and Investigations	CO1	To educate and train students to understand, interpret and complex diagnostic cardiac investigations.	3	2	2	1	3	2	3	3
		CO2	Prepare for Emergencies in the Cardiac Cath Lab Identify major and minor complications during cardiac catheterization. Apply Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) algorithms in emergencies.	3	3	3	1	3	2	2	2
	Introduction to Pacing and Electrophysiology Study Techniques	CO1	Identify indications for cardiac pacing based on international guidelines	3	2	2	2	2	1	2	3
		CO2	Identify indications for electrophysiological studies with/ without ablation in cases of complex arrhythmias.	3	2	2	1	2	1	2	2

		CO3	Develop Expertise in Cardiac Pacing & Pacemaker Therapy Describe normal cardiac conduction and the need for pacing. Interpret NBG codes for pacemakers and their application. Differentiate indications for temporary vs. permanent pacing. Understand the components and functioning of pacemakers.	3	2	3	1	3	2	2	2
	Research Methodology & Biostatistics (Core Course)	CO1	Student will be able to understand develop statistical models, research designs with the understating of background theory of various commonly used statistical techniques as well as analysis, interpretation & reporting of results and use of statistical software.	2	2	0	3	2	1	1	3
	MCCT Directed Clinical Education-I	CO1	Build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.	3	3	2	1	3	3	3	3
		CO 2	Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students' confidence and competence in delivering quality patient care.	3	3	3	1	3	3	3	3
		CO 3	Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills—key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.	3	3	3	1	3	3	3	3
Semester II	Introduction to Non-Invasive Techniques in Cardiology	CO1	Identify indications for non-invasive techniques based on international guidelines	2	2	1	1	2	2	2	3
		CO2	Develop Expertise in non-invasive techniques.ECG,Echocardiography,Stess Test,	3	3	3	1	3	3	3	3
	Invasive Cardiology	CO1	To enable students to not only be a helping hand to those just starting out in the specialty but also to serve as a reference for those who have been working in Invasive field for some time	2	2	3	1	2	3	3	2
		CO2	In-depth knowledge of cardiac diagnostic and interventional procedures, focusing on contrast media, intravascular imaging, coronary interventions, assist devices, peripheral angiography, and cardiac pharmacology.	3	3	3	2	3	3	3	3
	MCCT Directed Clinical Education- II	CO1	Build a robust theoretical foundation, enabling students to understand healthcare practices, disease management, and patient care, thereby empowering them to make informed decisions and adapt to evolving medical technologies.	3	3	2	1	3	3	3	3
		CO 2	Emphasize hands-on training, ensuring proficiency in clinical procedures, diagnostic techniques, and the use of advanced medical equipment. This practical exposure will bridge the gap between theory and practice, enhancing students' confidence and competence in delivering quality patient care.	3	3	3	1	3	3	3	3
		CO 3	Focus on developing professionalism, empathy, ethical conduct, teamwork, and communication skills—key traits for holistic patient care and effective collaboration in interdisciplinary healthcare teams.	3	3	3	1	3	3	3	3

SKILL EHANCEMENT COURSES										
Innovation and Enterprenuarship	CO1	Students will grasp the concepts of innovation, its ecosystem, and the role of various stakeholders such as government policies, startups, and innovation hubs.	2	1	0	2	2	2	1	2
	CO2	Cultivating an entrepreneurial mindset and leadership qualities necessary for driving innovation and leading ventures.	2	2	2	2	2	3	1	2
	CO3	Understanding the intersection of technology and innovation and leveraging emerging technologies for entrepreneurial ventures.	2	3	2	2	2	2	1.0	2
One Health (NPTEL)	CO1	A comprehensive understanding of One Health & role in global health challenges, emphasizing interconnectedness among human, animal, and environmental health.	2	2	2	3	2	3	2	2
	CO2	Topics include research ethics, disease surveillance, and successes in controlling emerging infectious diseases.	2	2	2	3	2	3	2	2
	CO3	Students explore disease emergence, transmission, antimicrobial resistance, and food safety, gaining insights into effective public health strategies.	2	2	2	3	2	3	2	2