

PROGRAM OUTCOME (POs)	
Course Code	B.Sc. CARDIAC CARE TECHNOLOGY
PO1	Knowledge Application: Apply fundamental and advanced knowledge of cardiac care technology to clinical and healthcare settings.
PO2	Technical Skills: Demonstrate proficiency in using cardiac care equipment and performing diagnostic and therapeutic procedures.
PO3	Clinical Competence: Exhibit the ability to effectively assess, diagnose, and manage patients with cardiovascular diseases.
PO4	Problem Solving: Utilize critical thinking and analytical skills to identify and solve complex clinical problems.
PO5	Ethical Practice: Adhere to ethical standards and principles in all aspects of clinical practice and patient care.
PO6	Communication Skills: Communicate effectively with patients, families, and healthcare professionals, both verbally and in writing.
PO 7	Team Collaboration: Work collaboratively within a multidisciplinary healthcare team to provide optimal patient care.
PO 8	Lifelong Learning: Engage in continuous professional development and lifelong learning to stay updated with advancements in cardiac care technology.
PO 9	Research Ability: Conduct and apply research to improve clinical practices and contribute to the advancement of cardiac care knowledge.
PO 10	Healthcare Management: Understand and apply principles of healthcare management, including resource allocation and quality assurance
PO 11	Patient Safety: Prioritize patient safety and implement practices that reduce risk and enhance patient outcomes.
PO 12	Critical Thinking: Use critical thinking skills to make informed decisions and provide high-quality care in complex clinical situations.

Annexure-3L of AC-50/2024

Course Outcomes (COs)	
Course Code	B.Sc. CARDIAC CARE TECHNOLOGY
SEMESTER I	
BCCT 101 L	Human Anatomy Part I
CO1	Define basic technical terminology and language associated with medical anatomy
CO2	Identify and describe the gross anatomy of various tissues and organs in the human body along with Skeletal and Muscular Systems
CO3	Understand and demonstrate the anatomy of Respiratory system, Circulatory system, Digestive system and Excretory system with it's clinical application
BCCT 102 L	Human Physiology Part I
CO1	Describe basic physiological principles involved in normal functioning of the human body and their applications in comprehending the pathophysiology of various diseases.
CO2	To understand the basic mechanism operating and regulating different organ systems.
CO3	Ability to identify techniques to evaluate the functioning of organ systems and interpret the results as normal or abnormal.
BCCT 103 L	General Biochemistry & Nutrition
CO1	Understand the fundamental principles of biochemistry, including the chemistry and functions of biomolecules such as carbohydrates, proteins, lipids and nucleic acids.
CO2	Gain insights into the principles of bioenergetics and enzymology in human body.
CO3	Understand the basics of collection, handling and processing analysis of blood and urine samples for clinical diagnostics.
BCCT 104 L	Introduction to National Health Care System (Multidisciplinary/Interdisciplinary)
CO1	Understand the measures of the health services and high-quality health care
CO2	Gain Basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world.
CO3	Introduction to Background objectives, action plan, targets, operations, in various National Health Programmes.
CO4	Introduction to the AYUSH System of medicines.

BCCT 105 P	Community Engagement and Clinical Visit (Including related practicals to the Parent course)
CO1	Understand the role of health professional in community
CO2	Personality Development
AEC 001 L	English and Communication Skills
CO1	Develop ability to read, write and speak better in English language
CO2	Grow personally and professionally to develop confidence in the field of healthcare.
AEC 002 L	Environmental Sciences
CO1	Understand and define terminology commonly used in environmental sciences
CO2	Understand the concepts of ecosystems, biodiversity and its conservation
CO3	Understand the relationship between humans and environment
CO4	Discuss the factors affecting the availability of natural resources, their conservation and management.
CO5	Discuss the goals, targets, challenges and global strategies for sustainable development
SEMESTER II	
BCCT 106 L	Human Anatomy Part II
CO1	Understand and demonstrate the anatomy of Reproductive system, Endocrine system, Nervous system, Sensory system and Lymphatic system with its clinical application
BCCT 107 L	Human Physiology Part II
CO1	Understand the basic physiological functions of Special senses and Skin,.
CO2	To understand the basic mechanism, operation and regulation of different systems such as Nervous system, Endocrine system, Reproductive system and Excretory system
CO3	Ability to identify techniques to examination of the physiological functioning of sensory and motor systems and interpret the results as normal or abnormal.
BCCT 108 L	General Microbiology
CO1	Understanding the Basic principles of Microbiology with General Methods for recovery, identification of pathogens, culture techniques, procedures, antibiotic testing and sterilization techniques.
CO2	Understand the applications of universal safety precautions.
CO3	Adept knowledge about the systemic bacteriology including morphology, species, lab diagnosis, isolation and identification.
CO4	Basic knowledge of pathogenic diseases and their clinical features
BCCT 109 L	Basic Pathology & Hematology
CO1	Know the basic concepts in hematology and clinical pathology
CO2	Ability to collect blood and urine sample under guidance
CO3	Ability to perform urine experiments under guidance
BCCT 110 L	Introduction to Quality and Patient Safety (Multidisciplinary / Interdisciplinary)
CO1	Understand the basic concepts of Quality in Health Care System and develop skills to implement sustainable quality assurance programs in the health system.
CO2	Understand the basics of emergency care and life support skills.
CO3	Understanding of the concepts for infection prevention and control.
CO4	Knowledge on the principles of on-site disaster management and prevent harm to workers, property, the environment and the general public.
CO5	Ability to apply healthcare quality improvement and patient safety principles, concepts, and methods at the micro, meso and macro system levels.

BCCT 111 P	Community Engagement and Clinical Visit (Including related practicals to the Parent course)
CO1	Understand the role of health professional in community
CO2	Personality Development
SEC 001 L	Medical Bioethics & IPR
CO1	Ability to recognise and understand ethical concerns in research and healthcare sector.
CO2	Adapt skills to rationally justify decisions by understanding the complexity and multi - dimensionality of medical or clinical ethical concerns.
CO3	Gain awareness about significance of patent, copyright, plagiarism and their applications in legal problems
SEC 002 L	Human Rights & Professional Values
CO1	Acquire conceptual clarity and develop respect for norms and values of freedom, equality, fraternity and justice
CO2	Awareness of civil society organizations and movements promoting human rights
CO3	Understand the difference between values of human rights and their duties
SEMESTER III	
BCCT 112 L	Applied Anatomy, Physiology, Pharmacology in Cardiac care
CO1	Understand the anatomy and physiology of the cardiovascular system, including the heart, blood vessels, and circulation.
CO2	Describe clinical pathologies related to cardiovascular physiology and their implications, including coronary artery disease, heart failure, and hypertension.
CO3	Apply pharmacological principles to drugs used in cardiovascular and nervous systems, including mechanisms of action, adverse drug reactions, and clinical indications.
BCCT 113 L	Basic Electrocardiography
CO1	Understand basic electrophysiology of the heart, including electrical field generation, action potentials, and the conduction system.
CO2	Describe ECG fundamentals, including electrode placement, lead selection, waveforms, intervals, and axis deviations.
CO3	Interpret ECG patterns, including sinus rhythms, atrioventricular blocks, atrial and ventricular arrhythmias, and stress test protocols.
BCCT 114 L	Basic Echocardiography
CO1	Understand the basics of echocardiography, including ultrasound principles, types of echocardiography, and the role of gel.
CO2	Describe echocardiography techniques and instrumentation, including 2D transthoracic echocardiography, Doppler methods, and cardiac assessment parameters.
CO3	Apply echocardiography for evaluating valvular heart disease, cardiac conditions, and special settings, including artificial valves, hypertension, and screening procedures.
GEC 001 L	Pursuit of Inner Self Excellence (POIS)
CO1	Students will become self-dependent, more debility for their study and career related matter ecisive and develop intuitive
CO2	Student's ability to present their ideas will be developed.
CO3	Enhanced communication skills, public speaking & improved Presentation ability.
CO4	Students will be able to explore their inner potential and inner ability to become a successful researcher or technician & hence become more focused.
CO5	Students will observe significant reduction in stress level.
CO6	With the development of personal attributes like Empathy, Compassion, Service, Love & brotherhood, students will serve the society and industry in better way with teamwork and thus grow professionally.
GEC 002 L	Organizational Behavior
CO1	Describe and apply motivation theories to team and organizational scenarios in order achieve a team's or an organization's goals and objectives.
CO2	Explain the effect of personality, attitudes, perceptions and attributions on their own and other's behaviors in team and organizational settings.
CO3	Explain types of teams and apply team development, team effectiveness, and group decision making models and techniques.

SEMESTER IV	
BCCT 116 L	Development of Cardiovascular System: Fetal & Neonatal
CO1	Understand the early development of the embryo and formation of early and extra-embryonic blood vessels.
CO2	Describe the development of the heart, including the formation and position of the heart tube, cardiac looping, and the formation of cardiac valves and great systemic veins.
CO3	Analyze fetal and neonatal circulation, changes at birth, adult circulation, and etiology of cardiovascular malformations.
BCCT 117 L	Cardiovascular Diseases Pertinent to Cardiac Care Technology
CO1	Describe valvular heart diseases, including aortic stenosis and mitral valve disorders, and their treatment options.
CO2	Explain coronary artery disease, hypertension, and heart failure, focusing on their pathophysiology and management strategies.
CO3	Identify myocardial diseases, congenital heart defects, and pericardial conditions, and outline their diagnostic and therapeutic methods.
BCCT 118 L	Medical Instrumentation relevant to Cardiac Care
CO1	Explain the basics of medical physics, including relevant machines and their applications.
CO2	Describe electro-physiological measurements and non-electrical parameter measurements, focusing on techniques and safety in medical environments.
CO3	Outline the functions and types of assisting and therapeutic equipment, and discuss various medical imaging techniques.
AEC 003 L	Computers and Applications
CO1	Introduction to Hardware and processing of computers and storage devices.
CO2	Adept knowledge of computer software and applications such as Microsoft office (Word, Excel and Power Point)
CO3	Application of operating systems, computer networks & internet in Health Care Settings.
AEC 004 L	Good Clinical Laboratory Practice and Research Skills
CO1	Proficiency and adept knowledge of Good Clinical Laboratory Practice (GCLP), ethical principles and guidelines to ensure patient rights and welfare in clinical research.
CO2	Understand the importance of Ethical Guidelines and Good Documentation Practices (GDP) in conducting Clinical Research.
CO3	Effectively understand the Basics of Biostatistics, Research Study Designing, Methodology, Implementation and Grant Application.
SEMESTER V	
BCCT 120 L	Advanced Electrocardiography
CO1	Describe the anatomy of the cardiac conduction system, basic electrophysiology principles, and how to manage arrhythmias using electrophysiology studies.
CO2	Explain the genesis of cardiac arrhythmias, their mechanisms, and management strategies including the use of antiarrhythmic agents, implantable devices, and ablation theory.
CO3	Analyze ECG changes in ischemic heart disease, stress test protocols, and disorders of impulse conduction, including pacemaker types, components, and troubleshooting methods.

BCCT 121 L	Advanced Echocardiography
CO1	Evaluate heart failure, including assessment of left ventricular systolic function, coronary artery disease, cardiomyopathies, and pericardial disease, and describe device therapies such as cardiac resynchronization therapy
CO2	Describe transesophageal echocardiography (TOE), including standard views, indications, advantages, disadvantages, patient preparation, contraindications, and potential complications.
CO3	Identify and assess cardiac masses, infections, congenital abnormalities, and special conditions like pregnancy and systemic diseases, and discuss recent advances in echocardiography such as 3D and 4D echo and tissue Doppler imaging.
BCCT 122 L	Invasive Cardiology
CO1	Describe contrast media properties, complications, and reactions, including Contrast-Induced Nephropathy (CIN).
CO2	Outline hemodynamics, pressure measurement systems, and sources of error and artifacts.
CO3	Compare IVUS with angiography, covering diagnostic uses, complications, and introduce Optical Coherence Tomography (OCT).
DSE 001 L	Basics of Clinical Skill Learning
CO1	Ability to Measure Vital Signs, do basic physical Examination of the patients, NG tube basics, Administration of Medicines
CO2	Understand about Asepsis, and the Cleanliness related to asepsis and on mobility of the patients
DSE 002 L	Hospital Operation Management
CO1	Understand and apply the knowledge of Medico-Legal regulations and Medical Ethics in Healthcare System.
CO2	Ability to utilize Hospital Information system in Hospital services.
CO3	Understand the operation management of Equipment's and medical records in Health Care services.
SEMESTER VI	
BCCT 124 L	Cardiac Catheterization
CO1	Explain asepsis procedures in the cardiovascular catheterization laboratory to prevent infections.
CO2	Detail diagnostic catheterization techniques and their applications in identifying cardiovascular conditions.
CO3	Describe the use and procedure of atherectomy and thrombectomy devices, including their complications.
BCCT 125 L	Pediatric Interventions
CO1	Outline diagnostic tools for assessing cardiac conditions in children, including history, physical examination, and laboratory tests
CO2	Describe procedures for using cardiac defect closure devices in PFO, ASD, VSD, PDA, and LAA.
CO3	Explain percutaneous valve commissurotomy, repair, and replacement techniques, including the management of valve pathologies.