विद्या विमुक्तिदायिनी

Bhaikaka University

Instilling Purpose in Healthcare

Charutar Arogya Mandal, Karamsad

A Curriculum

For

Post Graduate Diploma in Cardiac Care Technology

(PGDCCT)

CAM Institute of Allied Health Sciences &Technology

(A constituent Institute of Bhaikaka University)

(Academic Year 2024-25)

Vision

Our institute will be the most preferred destination for the aspirants who want to achieve the highest standard of excellence in the field of allied health sciences.

Mission

- To promote a collaborative working environment for the academicians and the students.
- To offer a curriculum emphasizing practical knowledge and clinical experience as to be implemented in authentic settings.
- To collaborate with clinicians and experts from basic biomedical sciences for education and research.

CURRICULUM

Discipline	Medical Technology
Program	Post Graduate Diploma
Specialization	Cardiac Care Technology
Subject Code	---
Tenure	1 (One Year)
Last Revised	July 2024

NOTIFICATION

Subject: Regulations and Curriculum pertaining to Post Graduate Diploma in Cardiac Care Technology Program

In exercise of the power conferred under section 22(3) of the Gujarat State Private Universities Act 2009, the Academic Council in its 9th meeting held on 22nd August 2024 under the agenda item No. 24.02.10, is pleased to approve the curriculum of **Post Graduate Diploma in Cardiac Care Technology Program** at Bhaikaka University.

The curriculum shall come into force from the Academic Year 2024-25.

By Order,
REGISTRAR

ACADEMIC REGULATIONS

1. TITLE OF THE PROGRAM:

This program shall be called as per the name given below under discipline of Medical Technology at Bhaikaka University, Karamsad. It comes into effect from the Academic Year 2024-25. The relevant regulatory bodies reserve the right to make changes to the regulations at any period of time.
Name of the program shall be: "POST GRADUATE DIPLOMA IN CARDIAC CARE TECHNOLOGY"

2. ELIGIBILITY FOR THE ADMISSION:

The candidate who has cleared Bachelor of Science degree in any specialization from the recognized university. The student should complete minimum of 20 years at the time of securing admission.

2.1 DURATION OF THE PROGRAM:

The program comprises of 1 (one) academic year including clinical rotation at the respective area of Cardiac center and Shree Krishna Hospital affiliated with Bhaikaka University.

2.2 MEDIUM OF INSTRUCTION:

English will be the medium of instruction for a11 the subjects and also for the examination of the program.

3. METHOD [S] OF INSTRUCTIONS:

- This program shall include teaching through lectures, practical, demonstration, group discussion, individual learning, kinesthetic or participative learning through traditional methods or by using ICT tools.
- Structured problem-based exercises shall be provided to simulate specific case examples
  Audio visual material and/or printed handouts shall be provided to supplement reading and classroom instruction.

4. CREDIT SYSTEM:

This program will have a curriculum in which every course will be assign certain credits reflecting its weight and contact periods per week as given below:

1 lecture (L)/week (15 Hours) * = 1 credit

1 Tutorial (T)/week (15 Hours) * = 1 credit

1 Practical (P)/week (30 Hours) * = 1 credit

* 1 credit of class room theory, tutorial and demonstration is equal to 15 hours of engagement in a year and 1 credit of practical class is equal to 30 hours of engagement in a year. In addition to theory and laboratory practicals there may be other courses such as seminal. Clinical training/Hospital posting, projects etc., which will be assigned credits as per their contribution in the program without regards to contact periods.

5. ELIGIBILITY TO APPEAR IN ANNUAL EXAMINATION:

- The student must have attended at least 75% of the total classes conducted in each course of the year separately in theory, practical and clinical postings.
- The students must have secured 45% of the total marks in each course of the academic year separately in theory and practical.

6. ASSESSMENT:

- Assessments should be completed by the academic staff, based on the compilation of the student 's theoretical & clinical performance throughout the education programme. To achieve this, all assessment forms and feedback should be included and evaluated.

5.1 INTERNAL ASSESSMENT

- Internal assessment shall be done based on continuous evaluation of the student. It includes mainly two internal examinations (one terminal examination & one preliminary examination). It may also include several unit tests and assignments submitted by the students throughout the year in each subject of the program. In order to award the internal marks in theory and practical, the average of the two internal examinations as well as unit tests, assignments, attendance and participation in curricular/extra-curricular activities shall be considered.

5.2 EXTERNAL ASSESSMENT

- External assessment shall include theory and practical examinations conducted as a part of the annual examinations of each subject (course) as per the schedule decided by the college and university.
- The scheme of question paper for theory and practical examinations will be as prescribed by the regulatory body.

7. AWARD OF GRADES:

- The student must secure minimum 45 % of marks in theory and practical examination separately to pass in the final University Examination.
- In case a student fails to secure minimum 45% marks in any theory or practical course, he/she shall reappear for the supplementary examinations or the annual examination of that course. However, his/her marks of the internal assessment shall be carried over and he/she shall be entitled for the grade obtained on passing.

7.1 ALLOCATION OF GRADE POINTS:

The student shall be awarded a final letter grade at the end of the academic year for each course as per the table shown below;

Table 1: Letter grades and Grade Points

Letter Grade	Grade Points	Marks
O (Outstanding)	10	≥90
A+ (Excellent)	9	85-89
A (Very Good)	8	75-84
B+ (Good)	7	65-74
B (Above Average)	6	55-64
C+ (Average)	5	45-54
F (Fail)	4	<45
Ab (Absent)	0	--

7.2 DECLARATION OF CLASS:

The class shall be awarded on the basis of CGPA as follows;

Class	CGPA
First Class with Distinction	**≥ 7.50**
First Class	**6.00 to 7.49**
Second Class	**4.8 to 5.59**
Pass Class	**<4.8**

The class shall be awarded on the basis of following;

Class	Details
First Class with Distinction	A successful candidate obtaining 75% and more marks of the grand total aggregate in the first attempt shall be declared to have passed these subjects with Distinction
First Class	A successful candidate obtaining 60% and more and less than 75% of the marks of the grand total aggregate in the first attempt shall be declared to have passed these subjects with first class
Second Class	A successful candidate obtaining 50% and more and less than 60% of the marks of the grand total aggregate in the first attempt shall be declared to have passed these subjects with Second class
Pass Class	Those candidates who do not fall in any above criteria's, but fulfil the requirement of passing of the whole course, will be shown as "PASS" in the grade card/mark sheet

8. PROGRAM OBJECTIVES:

- Program objectives aim at to equip students with advanced knowledge, technical skills, and practical experience necessary to effectively assist in the diagnosis, treatment, and management of cardiovascular conditions, ensuring a high standard of patient care and professional competence in cardiac care technology.

9. PROGRAM OUTCOMES:

PO1: **Mastery in Cardiac anatomy and physiology:** Demonstrate comprehensive understanding of the anatomy and physiology of the cardiovascular system, enabling accurate interpretation and application in clinical settings.

PO2: **Diagnostic Proficiency:** Acquire proficiency in operating and interpreting results from various diagnostic tools and technologies used in cardiology, such as ECG, echocardiography, and stress testing.

PO3: Therapeutic Equipment Operation: Competently handle and manage therapeutic equipment used in cardiac care, including pacemakers, defibrillators, and intra-aortic balloon pumps.

PO4: Patient Care and Management: Provide high-quality patient care by implementing appropriate clinical practices and protocols in preoperative, intraoperative, and postoperative settings.

PO5: Clinical Problem Solving: Develop critical thinking and problem-solving skills to address complex clinical scenarios, ensuring timely and effective decision-making in cardiac emergencies.

PO6: Team Collaboration: Work effectively as part of a multidisciplinary team, demonstrating strong communication skills and collaboration with healthcare professionals to deliver integrated cardiac care.

PO7: Ethical and Professional Standards: Uphold ethical and professional standards in all aspects of cardiac care, maintaining patient confidentiality, safety, and dignity.

PO8: Continuous Learning and Adaptation: Engage in lifelong learning and professional development, staying updated with the latest advancements and best practices in cardiac care technology.

These outcomes ensure that graduates of the program are well-rounded, competent professionals capable of making significant contributions to the field of cardiac care technology.

Name of the Institute: CAM Institute of Allied Health Sciences & Technology

Name of the Program: PGDCCT (Post Graduate Diploma in Cardiac Care Technology)

Duration of the Program: One year

Total Regular Subjects	04
Total Credit	40

CURRICULUM & CREDIT FRAME WORK

Course Code	Course Title	Hours/week			Marks		Total Mark	Credit
		L	T/D	P	Internal	External		
Core Courses								
24PDC0101	Basic Medical Science	4	1	-	30	70	**100**	**5**
24PDC0102	Cardiac Care Technology:Introduction & Clinical	4	1	-	30	70	**100**	**5**
24PDC0103	Cardiac Care Technology:Applied & Advanced	4	1	-	30	70	**100**	**5**
24PDC0104	Cardiac Care Technology:Practical	--	2	2	50	150	**200**	**3**
24PDC0105	Clinical Education (studentship)	--	22	--	100	--	**100**	**22**
	Total	**12**	**27**	**2**	**240**	**360**	**600**	**40**
Total hours		**1280**						

Note:

1) Abbreviations: L-Lecture, T-Tutorial and P-Practical

2) Considering eight months per academic year as working months, total contact hours per year shall be 1280 (One thousand two hundred and eighty)

24PDC0101 (Basic Medical Science)

Course Code	24PDC0101	Total Credit	5
Title of Subject	Basic Medical Science	Total Hours/Week	5

Examination Scheme

Continuous Assessment (30 marks)			External	TOTAL
Internal examinations	Projects / Assignments	Attendance	Annual examination	
20	05	05	70	100

Course Objectives	
	• To understand working of the body • To learn the cardiovascular system in detail manner. • To learn the functions of blood, mechanisms of blood clotting and hemostasis. • To understand the principles and equipment used in sterilization and disinfection. • To gain knowledge on Pathological, Biochemical, and Pharmacological Aspects of cardiovascular diseases and bleeding disorders.

Course Content

Unit	Description	Weightage
A. HUMAN ANATOMY		25%
1	**Introduction: Human body as a whole** 1.1 Definition of anatomy and its divisions 1.2 Terms of location, positions and planes 1.3 Cell and its organelles 1.4 Epithelium – Definition, Classification with examples & Function 1.5 Glands – Classification, Describe Serous & Mucous glands with examples 1.6 Basic tissues – Classification with examples	(10%)
2	**Cardiovascular System** 2.1 Heart-size, Location, Chambers, Exterior & Interior 2.2 Blood supply of heart 2.3 Systemic & Pulmonary Circulation 2.4 Arterial system - Branches of aorta, Common carotid artery, Subclavian artery, Axillary artery, Branchial artery, Superficial palmer arch, Femoral artery, Internal iliac artery 2.5 Venous system: Inferior vena-cava, portal vein, Portosystemic anastomosis, Great saphenous vein, Dural venous sinuses 2.6 Lymphatic system- cisterna chyli & thoracic duct 2.7 Histology of lymphatic tissues 2.8 Names of regional lymphatics, axillary and inguinal lymph nodes	(15%)

	Demonstration: 1. Demonstration of heart and vessels in the body 2. Histology of large artery, medium sized artery & vein, large vein 3. Microscopic appearance of large artery, medium sized artery & vein, large vein 4. Pericardium 5. Histology of lymph node, spleen, tonsil & thymus 6. Normal chest radiograph showing heart shadows 7. Normal angiograms	
B. HUMAN PHYSIOLOGY		25%
3	**Blood & Muscle Physiology:** 3.1 Composition & function of blood 3.2 Erythropoiesis & Leucopoiesis 3.3 Hemostasis 3.4 Action potential & mechanism of muscle contraction especially Heart muscle 3.5 Neuromuscular junction 3.6 Cardiovascular and Respiratory System in detail – Mechanism of breathing, oxygen and carbon dioxide transport, Pulmonary volume and capacity 3.7 Heart rate and sound 3.8 Peripheral Pulse 3.9 Blood pressure 3.10 Cardiac cycle and Cardiac Output	
C. MICROBIOLOGY		25%
4	**General Microbiology:** 4.1 Classification of microorganisms 4.2 Sterilization and Disinfection 4.2.1 Principles and use of equipments of sterilization 4.2.2 Antiseptic and disinfectants	(15%)
5	**Hospital Infection:** 5.1 Causative agents, transmission methods 5.2 Prevention and control Hospital infection. 5.3 Principles and practice Biomedical waste management	(10%)
D. BASICS OF CARDIOVASCULAR MEDICINE		25%
6	**Cardiovascular System:** Pathological, Biochemical & Pharmacological aspects of following: 6.1 Ischemic heart disease 6.2 Rheumatic heart disease 6.3 Congenital heart disease 6.4 Hypertension 6.5 Diabetes Mellitus and Metabolic Syndrome 6.6 Aortic Aneurysms 6.7 Cardiomyopathy	(10%)

7	**Hematology** 7.1 Anemia 7.2 Bleeding disorders 7.3 Laboratory tests used to diagnose bleeding disorders	(15%)

List of Reference Books:

A. HUMAN ANATOMY	
1	William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill 2. Human Anatomy for Nursing & Allied Sciences - 1 st edition, Dr. M.K.Anand, Dr. Meena Verma, The Arora Medical Publishers Pvt. Ltd
2	Human Anatomy for Nursing & Allied Sciences - 1 st edition, Dr. M.K.Anand, Dr. Meena Verma, The Arora Medical Publishers Pvt. Ltd
B. HUMAN PHYSIOLOGY	
1	Guyton (Arthur) Text Book of Physiology Latest, Ed. Prism publishers
2	Ganong (William F) Review of Medical Physiology, Latest Ed. Appleton
3	Jain A K Concise Physiology, Latest Ed
C. MICROBIOLOGY / PATHOLOGY / BIOCHEMISTRY	
1	Textbook of haematology: Dr. Tejinder Singh
2	Practical pathology by Dr.K.Uma Chaturvedi & Tejinder Singh
3	Godkar: Textbook of Medical Laboratory Technology
4	Textbook of Biochemistry: U. Satyanarayana
5	Ananthanarayana & Panikar's Textbook of Microbiology

***No practical examination for this subject/course.**

Course Outcome: At the end of the course, Students will be able to:

CO1	Students will grasp proficient knowledge in blood and muscle physiology
CO2	Students will understand mechanisms of breathing, gas transport, pulmonary volumes and cardiovascular mechanisms.
CO3	Students will develop expertise in Hospital Infection control

24PDC0102 (Cardiac Care Technology: Introduction & Clinical)

Course Code	24PDC0102	Total Credit	5
Title of Subject	Cardiac Care Technology: Introduction & Clinical	Total Hours/Week	5

Examination Scheme

Continuous Assessment (30 marks)			External	TOTAL
Internal examinations	Projects / Assignments	Attendance	Annual examination	
20	05	05	70	100

Course Objectives

- To grasp the principles of electrocardiography (ECG) and echocardiography.
- To learn the functions and operations of cardiac care technology, including ECG machines and echocardiographic equipment.
- To develop the ability to read and interpret normal and abnormal ECGs.
- To master the basic principles and instrumentation of echocardiography, including M-Mode, two-dimensional, Doppler, and transesophageal echocardiography.
- To gain knowledge of the equipment and materials used in the cardiac catheterization lab.
- To learn & apply ECG and echocardiography in diagnosing and managing various heart diseases, including rheumatic heart disease, ischemic heart disease, and congenital heart disease.
- To understand the importance of sterilization and safety protocols in the cardiac catheterization laboratory.

Course Content

Unit	Description	Weightage
Introduction to Cardiac Care Technology		50%
1	**Electrocardiography (ECG)** **Basic Principles:** 1.1 The Electrocardiographic paper 1.2 The Electrocardiograph 1.3 The Electrical field of Heart—Einthoven's triangle 1.4 The leads: Standard leads I, II, III unipolar limb leads aVR, aVL, aVF. horizontal planeleads V1-V6 1.5 Basic ECG deflections 1.6 Basic action of electrocardiograph	8%
2	2.1 **Normal EG** a) The 'P' wave b) PR interval c) The 'QRS' complex d) T wave; the S-T segment e) QT interval, QTc interval	10%

	f) The 'U' wave g) Rate & rhythm 2.2 The Electrical axis 2.3 Chamber enlargement – Right and Left atrial enlargement, LV hypertrophy & RV hypertrophy, bundle branch block, General principles a) Right Bundle branch block b) Left bundle branch block c) The Hemi blocks (Fascicular block) 2.4 ECG in myocardial infarction coronary insufficiency, Rheumatic heart disease drug & electrolyte disturbance, disorders of cardiac rhythm	
3	**Exercise Stress Testing** 3.1 Principle of Exercise Stress Testing 3.2 Exercise Protocols 3.3 Exercise testing – Indication and Techniques 3.4 Interpretation of Exercise testing	4%
4	Electrocardiography – **Principles & Instrumentation** **4.1 Principles of ECG** a) Basic principles of ultrasound b) M-Mode of Echocardiography c) Two-dimensional Echocardiography d) Doppler Echocardiography; color flow **e)** Transesophageal Echocardiography **4.2 Instrumentation** a) Basic pulse Echo system b) Transducers c) Pulse generation d) Echo detection e) A mode, B-Mode, M-Mode f) Display & recording	8%
5	**Doppler Echocardiography** **5.1 Introduction to Doppler color Echocardiography** – The Doppler principles – Doppler ultrasound techniques – Color Doppler flow imaging – Clinical application of Doppler Echocardiograph **5.2 Physical principles & instrumentation in spectral & color Doppler flow imaging** **5.3 Physical principles and Doppler effect. The Doppler Echocardiography system display** **5.4 Blood flow pattern – Laminar & Non-laminar flow** **5.5 Doppler Echo cardiograph modes** – Continuous wave Doppler system – Pulsed Doppler system – High pulse repetition frequency – Problems of color imaging	10%
6	**Contrast Echo**	(5 %)
7	**Echo measurements – 'ASE' Recommendation**	(5 %)

Cardiac Care Technology - Clinical		50%
8	**Electrocardiography in Cardiovascular disease:** 8.1 Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD 8.2 Echo in rheumatic heart disease – Echo in mitral stenosis, mitral incompetence, aortic stenosis, aortic incompetence, pulmonary hypertension. Post AVR, post MVR. Prosthetic valve malfunction, LA clot. 8.3 Echo in congenital heart disease – Echo in ASD, VSD, PDA pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF. dextrocardia. 8.4 Echo in ischemic heart disease – Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, LVaneurysm 8.5 Echo in other cardiovascular disease- Echo in various types of cardio myopathy infective endocarditis diseases of aorta, mitral valve prolapses, myxoma and other cardio vascular diseases. 8.6 Assessment of Cardiac function- measurements of all cardiac chambers andassessment of cardiac function 8.7 Echo in pericardial disease- pericardial effusion, cardiac tamponade, constrictivepericarditis	(25%)
9	**Cardiac catheterization laboratory** 9.1 General details of cardiac catheterizations equipment, how to handle the machine, common problems one may come across and how to overcome it, radiation hazards 9.2 Materials used in the Cath lab- all catheters, balloons, guidewires, pacemakers contrast material and other material used in the cardiac catheterization's laboratory a sterilization all these materials 9.3 Right heart catheterizations – procedure, Cath position, oximetry at various levels,Angio's done and its interpretation 9.4 Left heart catheterizations – procedure, Cath position, oximetry at various levels, Angio'sdone and its interpretation 9.5 Coronary angiogram – procedure, materials used, type and amount dye used, indications and contraindications, various pictures recorded in various angles and gross interpretation. 9.6 Peripheral angiogram – procedure, indication and contraindication	(25%)

REFERENCE BOOK

1. The Washington Manual of Echocardiography: South Asian Edition adapted for local practices, conditions and therapeutic, Publisher : Wolters Kluwer
2. Hutchison's Clinical Methods
3. A text book of Electrocardiography – Goldberger
4. Nanda's A Text book of Echocardiography

Course Outcome: At the end of the course, Students would be able to:

CO1	To accurately record and interpret ECGs and echocardiograms.
CO2	To demonstrate the principles of exercise stress testing and be able to conduct and interpret the tests effectively.
CO3	To use echocardiographic equipment and apply Doppler techniques to assess cardiac function and diagnose diseases.
CO4	To handle and troubleshoot cardiac care equipment.

24PDC0103 (Cardiac Care Technology : Applied & Advanced)

Course Code	24PDC0103	Total Credit	5
Title of Subject	Cardiac Care Technology:Applied & Advanced	Total Hours/Week	5

Examination Scheme

Continuous Assessment (30 marks)			External	TOTAL
Internal examinations	Projects / Assignments	Attendance	Annual examination	
20	05	05	70	100

Course Objectives	• Equip students with the ability to accurately interpret ECGs and perform advanced cardiac imaging techniques, including transesophageal echocardiograms, stress echoes, peripheral Doppler, and contrast echocardiography. • Educate students on interventional cardiology procedures, such as coronary and peripheral angioplasty, valvuloplasties, and device closures for congenital heart defects, while developing expertise in cardiac monitoring, arrhythmia management, treadmill test (TMT) interpretation, and cardiac arrest interventions. • Develop skills in using and interpreting data from oximetry and pressure recording instruments, performing pacing procedures, and effectively managing the recording and storage of cardiac data, with an emphasis on special considerations for procedures during pregnancy.

Course Content

Unit	Description	Weightage
Cardiac Care Technology – Applied		50%
1	1.1 ECG in myocardial infarction- definition of myocardial infarction, diagnosis of myocardial infarction, ECG criteria for myocardial infarction, ECG in anterior wall, inferior wall, true posterior wall and sub endocardial infarction and RV infarction 1.2 ECG in rheumatic heart disease – definition of rheumatic heart disease, valvular involvement in rheumatic heart disease, ECG in mitral stenosis, mitral incompetence, aortic stenosis and aortic incompetence 1.3 ECG in hypertension- definition of hypertension, how to record blood pressure, ECG inhypertension	17%
2	2.1 Trans esophageal echocardiogram – indications, procedure, usefulness and complications one may encounter and its management 2.2 Stress Echo- procedure and indications 2.3 Peripheral Doppler – Procedure and usefulness of peripheral Doppler	16%

3	3.1 Coronary angioplasty–procedure, materials used, complication one may encounter and howto manage it 3.2 Peripheral angioplasty – materials used and procedure. Angioplasty of coarctation of aorta 3.3 Fetal echocardiogram – Procedure, basic interpretation 3.4 Contrast echocardiogram – procedure and usefulness of contrast echocardiogram 3.5 Myocardial contrast echo - Basic knowledge	17%
Cardiac Care Technology – Advanced		50%
4	4.1 Cardiac monitoring – definition, purpose of cardiac monitoring, how to Recognize various arrhythmias how to set up an intensive coronary care unit and usefulness of ICCU 4.2 Interpretation of TMT, report – criteria for TMT positive test contraindication for TMT conditions where TMT is not useful, complications that may occur in TMT room and its management 4.3 Use of defibrillator- indications, how to use the defibrillator, complications during theprocedure and its management 4.4 Management of cardiac arrest – definition, causes external cardiac massage, artificial respiration and other drugs and procedures used in the management of Cardiac arrest	13%
5	5.1 Cardiac arrhythmias – bradyarrhythmia and tachy arrhythmias and ECG diagnosis of all rhythm disturbances. Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT, I0HB, II0HB, complete heart block 5.2 Electrolyte disturbances – ECG in hypokalemia, hyperkalemia etc. 5.3 Holter monitoring – procedure and usefulness	12%
6	6.1 Valvo-plasties - procedure, indications, complications and treatment of ballons, mitral valvuloplasty, ballon aortic valvuloplasty ballon pulmonary valvuloplasty and balloontricuspid valvuloplasty. 6.2 Coil closure and device closure of PDA – procedure, indications and materials used forcoil and device closure of PDA 6.3 Device closure of ASD – procedure, indications and materials used for device closure ofASD 6.4 Device closure of VSD – procedure, indications and materials used for device closure ofVSD	12%

REFERENCE BOOK

1. The Washington Manual of Echocardiography: South Asian Edition adapted for local practices, conditions and therapeutic, Publisher : Wolters Kluwer
2. Hutchison's Clinical Methods
3. A text book of Electrocardiography – Goldberger
4. Nanda's A Text book of Echocardiography

Course Outcome: At the end of the course, Students would be able to:

CO1	To acquire detailed knowledge of cardiac care technology, including ECG interpretation, echocardiography, angioplasty procedures, and cardiac monitoring.
CO2	To develop practical skills in handling advanced cardiac care equipment and performing diagnostic and interventional procedures.
CO3	To enhance their ability to critically analyze and manage complications arising from various cardiac procedures.
CO4	To ensure high standards of patient care and safety during cardiac procedures.
CO5	To prepare for advanced roles in cardiac care technology, contributing to improved patient outcomes in clinical settings.

24PDC0104 (Cardiac Care Technology: Practical)

Course Code	24PDC0104	Total Credit	3
Title of Subject	Cardiac Care Technology:Practical	Total Hours/Week	6

Examination Scheme

Continuous Assessment (30 marks)			External	TOTAL
Internal examinations	Projects / Assignments	Attendance	Annual examination	
30	10	10	150	200

Course Objectives

- To provide students with a comprehensive understanding of various medical electronic devices and equipment, including their components and functions.
- To train students in the performance and preparation of non-invasive cardiac diagnostic procedures.
- To educate students on conducting and managing invasive cardiac procedures and associated technologies.

Course Content

Unit	Description	Weightage
1	**Medical Electronics & Complete Usage Related to Cardiac Care Technology** 1.1. Equipments 1.2. Parts of Computer 1.3. History taking 1.4. Conversion between different units 1.5. Identifying the types of medical gas supply and its advantages/disadvantages 1.6. Devices: Sphygmomanometer, Thermometer, Pulse oximeter, Simple oxygen delivery devices	34%
2	**Non-Invasive Technology** 2.1. ECG recording basic 2.2. ECHO evaluation basic 2.3. Preparation for treadmill test 2.4. Preparation for 24 hours Holter monitoring 2.5. Echo Doppler 2.6. Preparation for ABPM (Ambulatory Blood Pressure Monitoring)	33%
3	**Invasive Technology** 3.1. Cardiac Cath right Heart 3.2. Cardiac Cath Left Heart 3.3. Cardiovascular Angiography 3.4. Cardiac Pacing 3.5. Relevant instrumentation in Cath Lab 3.6. Cardiac Emergencies in Cath Lab	33%

REFERENCE BOOK

1. The Washington Manual of Echocardiography: South Asian Edition adapted for local practices, conditions and therapeutic, Publisher : Wolters Kluwer
2. Hutchison's Clinical Methods
3. A text book of Electrocardiography – Goldberger
4. Nanda's A Text book of Echocardiography

Course Outcome: At the end of the course, Students will be able to:

CO1	To be proficient in operating essential medical electronics, including computer components, medical gas supply systems, and basic diagnostic devices like sphygmomanometers, thermometers, and pulse oximeters.
CO2	To perform and prepare for non-invasive cardiac tests such as basic ECG, ECHO evaluations, treadmill tests, 24-hour Holter monitoring, Echo Doppler procedures, and ambulatory blood pressure monitoring (ABPM).
CO3	To conduct invasive cardiac procedures, including heart catheterizations, cardiovascular angiography, and cardiac pacing, and manage relevant Cath Lab instrumentation and emergencies.