Study Scheme & Syllabus of

Bachelor of Cardiac Care Technology

Batch 2021 Onwards

By

Board of Studies

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

INDEX

Program Educational Objectives: At the end of the Program, the student will be able to: -	
PEO1	To cover all aspects of cardiovascular disease management and care.
PEO2	To learn the complex diagnostic and therapeutic procedures that involve use of various catheterization equipment, computer hardware, tools, machines and pharmacological agents.
PEO3	To acquire skills for management of various cardiac disorders.
PEO4	To learn how to study, interpret and care for anatomical specimens.

Program Outcomes: At the end of the Program, the student will be able to: -	
PO1	Fundamental knowledge of human anatomy.
PO2	Detailed knowledge of cardiovascular system.
PO3	Developing effective communication skills.
PO4	Developing empathy and counseling skills.
PO5	Learning technical skills of cardiology.
PO6	Providing higher education opportunity.
PO7	Developing capabilities of medical diagnosis and research.
PO8	Problem solving skills and ability to analyze.
PO9	Developing leadership skills and working in diverse environment.
PO10	Developing medical ethics and moral values.
PO11	Basic knowledge on research methodology.

Program Specific Outcomes: At the end of the Program, the student will be able to: -	
PSO1	Detailed subject knowledge of anatomy, physiology with awareness and comprehending along with all related ailments.
PSO2	Developing understanding of counselling, intensive care and resuscitation.
PSO3	Becoming expert as an associate to all interventional cardiology procedures and machinery.
PSO4	Introduction to advancement in cardiac care.

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical***	**Studio (If Applicable)**	**Internal**	**External**		
BCCT101-21	Allied Health Sciences	Core Theory	Basics of Anatomy-I	3	1	0	0	40	60	100	4
BCCT102-21	Allied Health Sciences	Core Theory	Basics of Physiology-I	3	1	0	0	40	60	100	4
BCCT103-21	Allied Health Sciences	Core Theory	Basics of Biochemistry-I	3	1	0	0	40	60	100	4
BCCT104-21	Allied Health Sciences	Core Practical/ Lab	Basics of Anatomy-I	0	0	4	0	60	40	100	2
BCCT105-21	Allied Health Sciences	Core Practical/ Lab	Basics of Physiology-I	0	0	4	0	60	40	100	2
BCCT106-21	Allied Health Sciences	Core Practical/ Lab	Basics of Biochemistry-I	0	0	4	0	60	40	100	2
BTHU-103-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	English	1	0	0	0	40	60	100	1
BTHU-104-18	Allied Health Sciences	Ability Enhancement Compulsory Course	English	0	0	2	0	30	20	50	1

		(AECC)									
HVPE-101-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction & Traffic Rules	3	0	0	0	40	60	100	3
HVPE-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction & Traffic Rules (Lab/ Seminars)	0	0	1	0	25	**	25	1
BMPD-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Mentoring & Professional Development	0	0	1	0	25	**	25	1

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

** Mentoring and Professional Development course will have internal evaluation only

Semester		**Second (2nd)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT201-21	Allied Health Sciences	Core Theory	Basics of Anatomy-II	3	1	0	0	40	60	100	4
BCCT202-21	Allied Health Sciences	Core Theory	Basics of Physiology-II	3	1	0	0	40	60	100	4
BCCT203-21	Allied Health Sciences	Core Theory	Basics of Biochemistry-II	3	1	0	0	40	60	100	4
BCCT204-21	Allied Health Sciences	Core Practical/ Lab	Basics of Anatomy-II	0	0	4	0	60	40	100	2
BCCT205-21	Allied Health Sciences	Core Practical/ Lab	Basics of Physiology-II	0	0	4	0	60	40	100	2
BCCT206-21	Allied Health Sciences	Core Practical/ Lab	Basics of Biochemistry-II	0	0	4	0	60	40	100	2
EVS102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Environmental Studies	2	0	0	0	40	60	100	1
BMPD-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Mentoring & Professional Development	0	0	1	0	25	**	25	1

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

** Mentoring and Professional Development course will have internal evaluation only

Semester		**Third (3rd)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical***	**Studio (If Applicable)**	**Internal**	**External**		
BCCT301-22	Allied Health Sciences	Core Theory	Anatomy and Physiology of Cardiovascular system	3	1	0	0	40	60	100	4
BCCT302-22	Allied Health Sciences	Core Theory	Applied Microbiology	3	1	0	0	40	60	100	4
BCCT303-22	Allied Health Sciences	Core Theory	General Pharmacology	3	1	0	0	40	60	100	4
BCCT304-22	Allied Health Sciences	Core Theory	Electrocardiography (ECG)	3	1	0	0	40	60	100	4
BCCT305-22	Allied Health Sciences	Core Theory	Life Style Diseases	3	1	0	0	40	60	100	4
BCCT306-22	Allied Health Sciences	Core Practical/ Lab	Anatomy and Physiology of Cardiovascular system	0	0	4	0	60	40	100	3
BCCT307-22	Allied Health Sciences	Core Practical/ Lab	Applied Microbiology	0	0	3	0	60	40	100	3
BCCT308-22	Allied Health Sciences	Core Practical/ Lab	General Pharmacology	0	0	4	0	60	40	100	3
BCCT309-22	Allied Health Sciences	Core Practical/ Lab	Electrocardiography (ECG)	0	0	4	0	60	40	100	4

BCCT310-22	Allied Health Sciences	Core Practical/ Lab	Life Style Diseases	0	0	4	0	60	40	100	3
BCCT311-22	Allied Health Sciences	Core Theory	Non-invasive Diagnosis Cardiovascular system	2	0	0	0	40	60	100	2

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Semester		**Fourth (4th)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical***	**Studio (If Applicable)**	**Internal**	**External**		
BCCT401-22	Allied Health Sciences	Core Theory	Basic Patient care	3	1	0	0	40	60	100	4
BCCT402-22	Allied Health Sciences	Core Theory	Basics Cardiac Evaluation	3	1	0	0	40	60	100	4
BCCT403-22	Allied Health Sciences	Core Theory	Cardiac Catheterization	3	1	0	0	40	60	100	4
BCCT404-22	Allied Health Sciences	Core Theory	Cardiac Medical Instrumentation	3	1	0	0	40	60	100	4
BCCT405-22	Allied Health Sciences	Core Practical/ Lab	Basic Patient care	0	0	2	0	60	40	100	2
BCCT406-22	Allied Health	Core Practical/ Lab	Basics Cardiac	0	0	4	0	60	40	100	2

	Sciences		Evaluation								
BCCT407-22	Allied Health Sciences	Core Practical/ Lab	Cardiac Catheterization	0	0	4	0	60	40	100	2
BCCT408-22	Allied Health Sciences	Core Practical/ Lab	Cardiac Medical Instrumentation	0	0	4	0	60	40	100	2

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Semester		**Fifth (5th)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BXXX-501-22											
BXXX-502-22											
BXXX-503-22											
BXXX-504-22											

Semester		**Sixth (6th)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BXXX-601-22											
BXXX-602-22											
BXXX-603-22											
BXXX-604-22											

Semester		**Seventh (7th)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BXXX-701-22											
BXXX-702-22											
BXXX-703-22											
BXXX-704-22											

Semester		**Eighth (8th)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BXXX-801-22											
BXXX-802-22											
BXXX-803-22											
BXXX-804-22											

List of Elective (Heading Font = Tahoma, Size = 16)

Elective-I (if applicable) (Heading Font = Tahoma, Size = 14)

BXXX-XXX-22 (Font = Tahoma, Size = 12)
BXXX-XXX-22
BXXX-XXX-22
BXXX-XXX-22

Elective-II (if applicable) (Heading Font = Tahoma, Size = 14)

BXXX-XXX-22 (Font = Tahoma, Size = 12)
BXXX-XXX-22
BXXX-XXX-22
BXXX-XXX-22

Elective-III (if applicable) (Heading Font = Tahoma, Size = 14)

BXXX-XXX-22 (Font = Tahoma, Size = 12)
BXXX-XXX-22
BXXX-XXX-22
BXXX-XXX-22

Open Elective (if applicable) (Heading Font = Tahoma, Size = 14)

BXXX-XXX-22 (Font = Tahoma, Size = 12)
BXXX-XXX-22
BXXX-XXX-22
BXXX-XXX-22

Examination and Evaluation

Theory				
Sr. No.	**Evaluation Criteria**	**Weightage in Marks**		**Remarks**
1.	Mid Term / Sessional Tests	30	10	Internal Evaluation (XX Marks) MSTs, Quizzes, Assignments, Attendance etc., constitute internal evaluation. Average of two mid semester test will be considered for evaluation.
2.	Attendance	5	5	
3.	Assignments	5	5	
4.	End Semester Examination	60	30	External Evaluation
5.	**Total**	**100**	**50**	Marks May be rounded off to nearest integer

Practical			
Sr. No.	**Evaluation Criteria**	**Weightage in Marks**	**Remarks**
1.	Evaluation of Practical Record / Viva Voce / Attendance / Seminar / Presentation	30	Internal Evaluation
2.	Final Practical Performance + Viva Voce	20	External Evaluation
3.	**Total**	**50**	Marks May be rounded off to nearest integer

Question Paper Pattern for MST:

Roll No: **No. of Pages**

I. K. Gujral Punjab Technical University, Jalandhar

Department of Allied Health Sciences Academic

Session: -

Mid-Semester Test (I / II / III) (Regular / Reappear): -	**Xxxxxxx**	Date: -	**DD/MM/YYYY**
Programme: -	**Xxxxxxxx**	Semester: -	**XX Semester**
Course Code: -	**xxxx-xxx-YY**	Course: -	**Xxxxx**
Maximum Marks: -	**Xxx**	Time: -	**xx HH xx MM**

* Note: - Section A is Compulsory, Attempt any two questions from Section B and One Question from Section C.

Section: A		**Marks**	**COs**
1.		02	
2.		02	
3.		02	
4.		02	
Section: B		**Marks**	**COs**
5.			
6.			
7.			
Section: C		**Marks**	**COs**
8.			
9.			

Details of Course Objectives

CO1	Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body.
CO2	Students will learn the etiology and pathogenesis of the various disease states.
CO3	Students shall be able to know the various types of application of computers in health care.
CO4	Students will be able to learn the terminology of the subject and basic knowledge of basic chemistry and biochemistry involved in physiology of human body.
CO5	Emphasis is placed on building familiarity with medical words through knowledge of roots, prefixes, and suffixes.

SEMESTER-I

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT101-21	Allied Health Sciences	Core Theory	Basics of Anatomy-I	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives :-

The Course aims to provides a learning and understanding and evaluating and issues with the general anatomical structures of the human body.

Course Outcomes :-

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body.

CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

CO3 - Students will learn various mechanism of contraction and relaxation.

Hours

Unit I — 12

Introduction: Definition of anatomy and its divisions, Terms of location, positions and planes. • Cell and its organelles, Tissues & its classification, Glands.

Cardiovascular System: Arteries & veins, Capillaries & arterioles, Heart- size, location, Cardiac chambers, blood supply of heart, pericardium, Systemic & pulmonary circulation, Major blood vessels of Heart- Aorta, pulmonary artery, common carotid artery, subclavian artery, axillary artery, brachial artery, common iliac artery, femoral artery, Inferior vena cava, portal circulation, great saphenous vein.

Unit II — 12

Lymphatic System: Lymph & Lymph vessels, Structure of lymph node, names of regional lymphatics, auxiliary and inguinal lymph, nodes.

Respiratory system: Parts of Respiratory system; Structure of nose, nasal

cavity, larynx, trachea, lungs, pleura, bronchopulmonary segments.

Unit III

Gastro-intestinal System: Parts of GIT, structure of tongue, pharynx, 12 salivary glands, Location & Gross structure of esophagus, stomach, intestine (small and large), liver, gall bladder, pancreas, spleen.

Unit IV

Musculoskeletal system: Structure of Bone & its types, Joints- 10 Classification of joints with examples; details of synovial joint, Bones & joints of upper limb, lower limb and their movements, Axial skeleton & appendicular skeleton, Skull, spine & its movements, intervertebral disc, Muscles & its types, Muscles of the upper limb, lower limb, trunk and neck.

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
3	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C, Guyton and John. E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S. A

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT102-21	Allied Health Science	Core Theory	Basics of Physiology-I	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

To teach the fundamental concepts of Human Physiology.

Course Outcomes: -

CO1 - Students will be able to learn the basic functions of cells, tissues, blood and understand physiology of human body.
CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

Unit-

I Cardiovascular System: Heart-Physiological Anatomy, Nerve supply, Properties of cardiac muscle, Cardiac Cycle-Events –systole, diastole, Cardiac Output-Definition and factors affecting it, Heart sounds-normal heart sounds, its causes, areas of auscultations, Blood Pressure-Definition, normal value, Physiological variations, its measurement, ECG- normal waves, Shock-Definition, Types.

II Blood:
Red Blood Cells- Functions, count, Physiological variations. Erythropoiesis-stages, Hemoglobin-Functions, Physiological variations,
White Blood Cells-Functions, count, morphology, Platelets-count, morphology, functions. Hemostasis-Definition, Mechanism, clotting factors, Blood groups-ABO system, Rh system, Blood transfusion-Indication, transfusion reactions, Anemias-classification, morphological and Etiological effects of anemia on body

III Respiratory System: Physiological Anatomy, Functions of the respiratory system, Types of respiration, respiratory membrane, Lung volumes and capacities, vital capacity and factors affecting it, Transport of Oxygen- Forms of transportation, Oxy-hemoglobin dissociation curve and factors affecting it, Transport of Carbon-Dioxide- Forms of transportation, Hypoxia-Definition, types, effects of hypoxia, Cyanosis-Definition and types, Artificial Respiration- CPR

IV Gastrointestinal System: Physiological Anatomy, functions of GIT, Salivary Gland- functions of saliva, Stomach- structure and functions, Gastric secretions- composition, functions, Mechanism, Pancreas- structure, functions, composition of Pancreatic juice, Liver-Functions of liver, Bile-Composition, functions, Jaundice- Types and its causes, Gall Bladder- Functions, Intestine- Movements of small and large intestine, Digestion and Absorption of Carbohydrates, Proteins, Fats, Hormones of GIT- Functions of Gastrin, Secretin, CCK-PZ.

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
3	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C, Guyton and John.E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S.A

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT103-21	Allied Health Science	Core Theory	Basics of Biochemistry-I	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

To teach the fundamental concepts of cell biology & biochemistry.

Course Outcomes: -

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of basic chemistry and biochemistry involved in physiology of human body.

CO2 - They will be able to understand the reports generated by laboratory and shall be able to convey the surgeon about any critical alert.

Unit		**Contact Hours**
I	Cell: Morphology, structure & functions of cell, cell membrane, Nucleus, chromatin, Mitochondria, Endoplasmic Reticulum, Ribosomes. Carbohydrates: Definition, chemical structure, functions, sources, classifications, Monosaccharides, Disaccharides, Polysaccharides, mucopolysaccharide and its importance, glycoproteins Lipids: Definition, function, sources, classification, simple lipid, compound lipid, derived lipid, unsaturated and saturated fatty acid. Essential fatty acids and their importance, Blood lipids and their implications, cholesterol with its importance.	12
II	Proteins: Definition, sources, amino acids, structure of protein, their classification, simple protein, conjugated protein, derived proteins and their properties.	14

	Enzymes: Definitions, mechanism of action, factors affecting enzyme action, enzyme of clinical importance.	
III	Nutrition 1) Vitamins: Types, functions and role. 2) Principal minerals and their functions (Ca, P, Mg, Na, K, Cl) 3) Balanced diet, Diet for Chronically and terminally ill patients, post operative patients Bioenergetics: Energy rich compounds, Respiratory chain and Biological oxidation.	10
IV	Carbohydrate Metabolism: Glycolysis, TCA cycle, Glycogen metabolism, Gluconeogenesis, Maintenance of Blood Glucose. Diabetes Mellitus and its complications.	16

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Lehninger	Principles of Biochemistry	W.H. Freeman & Company, New York
2	Berg, J.M., Tymoczko, J.L. and Stryer L	Biochemistry	W.H. Freeman & Company, New York
3	Voet, D.J., Voet, J.G. and Pratt, C.W	Principles of Biochemistry	John Wiley & Sons, New York
4	Murray, R.K., Granner, D.K., Mayes and P.A., Rodwell, V.W	Harper's Biochemistry	Lange Medical Books/McGraw Hill

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT104-21	Allied Health Sciences	Core Practical/ Lab	Basics Of Anatomy-I	0	0	4	0	60	40	100	2

Pre-requisite: -

Course Objectives: -

To make the students learn practical aspects of Human Anatomy.

Course Outcomes: -

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body.
CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

CO3 - Students will learn various mechanism of contraction and relaxation.

Unit I Histology: • Epithelium: Simple (squamous, cuboidal, columnar, ciliated), Stratified, Transitional • Bone, muscles (skeletal, smooth, cardiac) • Cartilage (hyaline, elastic, fibro cartilage). • Connective Tissue (loose and dense). • Arteries (large & medium sized), Veins.

- Demonstration of various parts of body
- Demonstration of tissues of body
- Demonstration of parts of digestive system
- Demonstration of parts of respiratory system
- Demonstration of parts of skin
- Demonstration of various parts of circulatory system (Demonstration from models)
- Demonstration of structural differences between skeletal, smooth and cardiac muscles (permanent mounts)
- Demonstration of various bones and joints
- To study circulatory system from charts and transverse section (TS) of artery and vein from permanent slides.
- To study digestive system from charts and TS of liver, spleen and pancreas from permanent slides.
- To study various body fluids.

Note: Demonstrations can be done with the help of models, charts and histological slides

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
3	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C,GuytonandJohn.E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S.A

Semester		First (1st)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT105-21	Allied Health Sciences	Core Practical/ Lab	Basics of Physiology-I	0	0	4	0	60	40	100	2

Pre-requisite: -

Course Objectives: -

To make the students learn practical aspects of Human Physiology.

Course Outcomes: -

CO1 - Students will be able to learn the basic functions of cells, tissues, blood and understand physiology of human body.
CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

Contents

- Examination of blood film for various blood cells from stained slides.
- Blood pressure estimation
- Estimation of Hemoglobin Concentration
  - Determination of Bleeding Time and Clotting Time
  - Determination of Blood Groups
  - Recording of normal Blood Pressure
  - Clinical Examination of Arterial Pulse
  - Determination of Vital Capacity

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
	Principles of Anatomy		

2	& Physiology	Tortora & Bryan	WILEY
3	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C, Guyton and John.E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S.A

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Lord Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT106-21	Allied Health Sciences	Core Practical/ Lab	Basics of Biochemistry-I	0	0	4	0	60	40	100	2

Pre-requisite: -

Course Objectives: -

To make the students learn practical aspects of Biochemistry.

Course Outcomes: -

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of basic chemistry and biochemistry involved in physiology of human body.

CO2 - They will be able to understand the reports generated by laboratory and shall be able to convey the surgeon about any critical alert.

Contents

1. Safety measures in laboratories.
2. Preparation of normal and molar solutions.
3. Preparation of buffers.
4. Determination of pKa of acetic acid and glycine.
5. Qualitative tests for carbohydrates, lipids, amino acids, proteins and nucleic acids.
6. Separation of amino acids/ sugars/ bases by thin layer chromatography.
7. Estimation of vitamin C.

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	D. Shaheen	Physical Biochemistry	Wiley Blackwell Publishers
2	T. G. Coopers	The Tools of Biochemistry	Wiley India Pvt. Ltd.
3	Voet, D.J., Voet, J.G. and Pratt, C.W	Principles of Biochemistry	John Wiley & Sons, New York
4	Murray, R.K., Granner, D.K., Mayes and P.A., Rodwell, V.W	Harper's Biochemistry	Lange Medical Books/McGraw Hill

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BTHU-103-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	English	1	0	0	0	40	60	100	1

Pre-requisite: -

Course Objectives: -

To learn effective communication both oral & written.

Course Outcomes: -

CO1 - The students will be able to appreciate communication skills as these are important to everyone - those are how we give and receive information and convey our ideas and opinions with those around us.

CO2 - The students trained with this course will be able to deal with patients, their fellows and seniors, face to face, in a better way.

Unit		
I	Theory of Communication Types and modes of Communication	4
II	Language of Communication Verbal and Non-verbal (Spoken & verbal), Personal, Social and Business Barriers and Strategies, Intra-personal, Inter-personal and Group communication	6
III	**Reading and Understanding** Close Reading, Comprehension, Summary Paraphrasing,	10

	Analysis and Interpretation, Translation (from Hindi/Punjabi to English And vice-versa), Literary/ Knowledge Text	
IV	Documenting, Report Writing, Making Notes, Letter Writing	10

Reference Books

1. Fluency in English - Part II, Oxford University Press, 2006.
2. Business English, Pearson, 2008.
3. Language, Literature and Creativity, Orient Blackswan, 2013.
4. Language through Literature (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas
5. On Writing Well. William Zinsser. Harper Resource Book. 2001
6. Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.

Semester		First (1st)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BTHU-104-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	English	0	0	2	0	30	20	50	1

Pre-requisite: -

Course Objectives: -

To learn effective communication both oral & written.

Course Outcomes: -

CO1 - The students will be able to appreciate communication skills as these are important to everyone - those are how we give and receive information and convey our ideas and opinions with those around us.

CO2 - The students trained with this course will be able to deal with patients, their fellows and seniors, face to face, in a better way.

I **Interactive practice sessions in Language Lab on Oral Communication**

Listening Comprehension

Self-Introduction, Group Discussion and Role Play

Common Everyday Situations:

Conversations and Dialogues

Communication at Workplace

Interviews
Formal Presentations, Effective Communication/ Mis-communication
Public Speaking

Reference Books

1. Fluency in English - Part II, Oxford University Press, 2006.
2. Business English, Pearson, 2008.
3. Practical English Usage. Michael Swan. OUP. 1995.
4. Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
5. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
HVPE-101-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction & Traffic Rules	3	0	0	0	40	60	100	3

Pre-requisite: -

Course Objectives: -

To develop a sense of social responsibility, traffic rules and about menace of drugs.

Course Outcomes: -

CO1 – Students will understand Happiness and Prosperity in today's life.
CO2 - The students will Understand values and harmony in human-human relationship.
CO3 – Students will learn basis for humanistic education, humanistic constitution and humanistic universal order.

Unit		**Hours**
I	**Course Introduction – Need, Basic Guidelines, Content and Process for Value Education** Understanding the need, basic guidelines, content and process for Value Education Self Exploration–what is it? – its content and process; 'Natural Acceptance' and Experiential Validation-as the mechanism for self-exploration Continuous Happiness and Prosperity- A look at basic Human Aspirations Right understanding, Relationship and Physical Facilities- the basic requirements for 18ulfilment of aspirations of every human being	6

	with their correct priority Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario Method to 18ulfil the above human aspirations: understanding and living in harmony at various levels	
II	**Understanding Harmony in the Human Being – Harmony in Myself!** Understanding human being as a co-existence of the sentient 'I' and the material 'Body' Understanding the needs of Self ('I') and 'Body' – Sukh and Suvidha Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer) Understanding the characteristics and activities of 'I' and harmony in 'I' Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail Programs to ensure Sanyam and Swasthya Practice Exercises and Case Studies will be taken up in Practice Sessions.	6
III	**Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship** Understanding harmony in the Family- the basic unit of human interaction Understanding values in human-human relationship; meaning of Nyaya and program for its 18ulfilment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship Understanding the meaning of Vishwas; Difference between intention and competence Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals Visualizing a universal harmonious order in society- Undivided Society (AkhandSamaj), Universal Order (SarvabhaumVyawastha)- from family to world family! Practice Exercises and Case Studies will be taken up in Practice Sessions	6
IV	**Understanding Harmony in the Nature and Existence – Whole existence as Co-existence** Understanding the harmony in the Nature	4

Interconnectedness and mutual 19ulfilment among the four orders of nature-
recyclability and self-regulation in nature
Understanding Existence as Co-existence (Sah-astitva) of mutually
interacting units in all-pervasive space
Holistic perception of harmony at all levels of existence
Practice Exercises and Case Studies will be taken up in Practice
Sessions.

V **Implications of the above Holistic Understanding of Harmony on Professional** 6

Natural acceptance of human values
Definitiveness of Ethical Human Conduct
Basis for Humanistic Education, Humanistic Constitution and Humanistic
Universal Order
Competence in professional ethics:
Ability to utilize the professional competence for augmenting universal human order,

Ability to identify the scope and characteristics of people- friendly and eco-friendly production systems,

Ability to identify and develop appropriate technologies
and management patterns for above production systems.

Case studies of typical holistic technologies, management models and
production systems
Strategy for transition from the present state to Universal Human Order:
At the level of individual: as socially and ecologically responsible
engineers, technologists
and managers

b) At the level of society: as mutually enriching institutions and organizations

Reference Books

Text Book

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education
2. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
3. E.F. Schumacher, 1973, Small is Beautiful: a study of economics as if people mattered, Blond& Briggs, Britain.
4. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
5. Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991
6. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Purblishers.
7. A.N. Tripathy, 2003, Human Values, New Age International Publishers.

Relevant CDs, Movies, Documentaries & Other Literature:

1. Value Education website, http://uhv.ac.in

2. Story of Stuff, http://www.storyofstuff.com

3. Al Gore, An Inconvenient Truth, Paramount Classics, USA

4. Charlie Chaplin, Modern Times, United Artists, USA

5. IIT Delhi, Modern Technology – the Untold Story

Semester		First (1st)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
HVPE-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction & Traffic Rules (Lab/ Seminars)	0	0	1	0	25	**	25	1

Pre-requisite: -

Course Objectives: -

To develop a sense of social responsibility, traffic rules and about menace of drugs.

Course Outcomes: -

CO1 – Students will understand Happiness and Prosperity in today's life.
CO2 - The students will understand values and harmony in human-human relationship.
CO3 – Students will learn basis for humanistic education, humanistic constitution and humanistic universal order.

- One each seminar will be organized on Drug De-addiction and Traffic Rules.
- Eminent scholar and experts of the subject will be called for the Seminar atleast once during the semester. It will be binding for all the students to attend the seminar.

Semester		First (1st)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BMPD-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Mentoring & Professional Development	0	0	1	0	25	**	25	1

Pre-requisite: -

Course Objectives: -

To learn the lifelong learning skills.

Course Outcomes: -

CO1 – Students will understand about presentations.
CO2 – Students will lose stage fear.
CO3 – Students will learn about group discussion.

I **Part-A (Class Activities)**

1. Expert and video lectures
2. Aptitude Test
3. Group Discussion
4. Quiz (General/Technical)
5. Presentations by the students
6. Team building Exercises

7* A part of above six points practicals on Fundamentals of Computers are also added as per Annexure-I

II **Part-B (Outdoor Activities)**

1. Sports/NSS/NCC
2. Society Activities of various students chapter i.e. ISTE, SCIE, SAE,

CSI,
Cultural Club,
etc.

Evaluation shall be based on rubrics for Part – A & B

Mentors/Faculty in charges shall maintain proper record student wise of each activity conducted and the same shall be submitted to the department.

SEMESTER II

Semester		Second (2nd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT201-21	Allied Health Sciences	Core Theory	Basics of Anatomy-II	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning and understanding and evaluating and issues with the general anatomical structures of the human body.

Course Outcomes: -

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body.
CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

CO3 - Students will learn various mechanism of contraction and relaxation.

Unit

I Urinary System: Parts of Urinary system, location and gross structure of kidney, ureter, urinary bladder, urethra.

II Reproductive system: Parts of male reproductive system, gross structure of testis, vas deferens, epididymis, prostate, Parts of female reproductive system, gross structure of uterus, ovary, fallopian tube, mammary gland.

III Endocrine glands: Name of all endocrine glands, gross structure & functions of pituitary gland, adrenal gland, thyroid gland and parathyroid gland.

IV Nervous system: Neuron, classification of NS, Meninges, ventricles, CSF, Gross features of cerebrum, midbrain, pons, medulla oblongata, cerebellum, name of basal nuclei, Blood supply of brain, cranial nerves, Spinal cord and spinal nerves, Autonomic nervous system, Visual & auditory pathways.
Sensory Organs: Skin & its appendages, Structure of eye & lacrimal apparatus, name of extraocular muscles. Structure of ear: external, middle & inner ear.

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
3	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C,Guyton and John.E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S.A

Semester		Second (2nd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT202-21	Allied Health Sciences	Core Theory	Basics of Physiology-II	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

To teach the fundamental concepts of human physiology.

Course Outcomes: -

CO1 - Students will be able to learn the basic functions of cells, tissues, blood and understand physiology of human body.
CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

Unit	
I	Excretory System: Kidneys-structure of nephron, functions of kidney Glomerular filtration Rate (GFR) and factors affecting it, Counter Current Mechanism, Bladder-its innervation, micturition reflex
II	Reproductive System: Male Reproductive System-Stages of spermatogenesis, function of Testosterone, Female Reproductive System-Ovulation, menstrual cycle, functions of Estrogen and progesterone

III Central Nervous System: Structure of neuron, functions of nervous system, Classification and properties of nerve fibers, Synapse- structure and types, Receptors-Definition, classification, properties, Reflex Arc, Ascending and Descending tracts- names and functions, Functions of Hypothalamus, Functions of Cerebellum and Basal Ganglia, Functions of Cerebral Cortex, Autonomic Nervous System- Actions of sympathetic and parasympathetic system, and their comparison., Special Senses-Eye- structure, functions of different parts, Visual acuity, Refractive errors Ear- structure, functions, General mechanism of hearing.

IV Nerve Muscle Physiology: Classification of Muscle, structure of skeletal
muscle, Neuromuscular Junction, Excitation Contraction Coupling

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C,Guyton and John.E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S.A

Semester		**Second (2nd)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT203-21	Allied Health Sciences	Core Theory	Basics of Biochemistry-II	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

To teach the fundamental concepts of cell biology & biochemistry.

Course Outcomes: -

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of basic chemistry and biochemistry involved in physiology of human body.

CO2 - They will be able to understand the reports generated by laboratory and shall be able to convey the surgeon about any critical alert.

Unit		
I	**Nucleic Acids & its metabolism:** Nucleosides, Nucleotides, Purines, Pyrimidines, Structure of DNA & its types (A, B & Z DNA's), RNA & its types, Metabolism of Purines & Pyrimidines and their disorders.	8
II	**Metabolism of Fatty Acids:** Digestion, absorption of lipids. Chylomicrons, Oxidation of Fatty Acids. Disorders of Fat metabolism, Fatty Liver & its causes. Ketosis & its salient features, causes and diagnosis of Ketosis. Lipoproteins, classification & types of Lipoproteins, LDL & HDL, their functions & clinical applications. Hyperlipidemias and Cardiovascular Diseases.	12

III	**Metabolism of Amino Acids:** Formation of ammonia, Transamination, Biological significance & clinical significance of Transamination. Trans deamination: oxidative & non-oxidative deamination, Urea Cycle, disorders of urea cycle.	10
IV	**Clinical Biochemistry:** Water and Electrolyte, Fluid compartment, daily intake and output sodium and potassium balance Nerve tissue: Neuro transmitters and nerve activity. Hormones: Actions of Hormone Insulin, Glucagon, Thyroid and Parathyroid hormones, Cortical hormones. Acid Base Balance, role of lungs and kidneys, – Regulation of blood pH, acidosis, Alkalosis, Physical Chemistry: Osmosis, Dialysis, Donnan Membrane equilibrium Liver, Gastric, Pancreatic and Kidney functions tests.	12

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	D.M. Vasudevan, S. Sreekumari and KannanVaidyanathan	Textbook of Biochemistry forMedical Students	The Health Science Publishers
2	Murray, R.K., Granner, D.K., Mayes and P.A., Rodwell, V.W	Harper's Biochemistry	Lange Medical Books/McGraw Hill
3	Berg, J.M., Tymoczko, J.L. and Stryer L	Biochemistry	W.H. Freeman & Company, New York
4	Lehninger	Principles of Biochemistry	W.H. Freeman & Company,New York

Semester		Second (2nd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT204-21	Allied Health Sciences	Core Practical/ Lab	Basics of Anatomy-II	0	0	4	0	60	40	100	2

Pre-requisite: -

Course Objectives: -

To make the students learn practical aspects of human anatomy.

Course Outcomes: -

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of cells, tissues, blood and to understand anatomy and physiology of human body.
CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

CO3 - Students will learn various mechanism of contraction and relaxation.

- Demonstration of parts of Urinary system
- Demonstration of parts of Reproductive system
- Demonstration of parts of Nervous System: Brain and Spinal Cord, Cranial & Spinal Nerves
- Demonstration of various Sensory Organs: Eye, Ear (Demonstration from models)

Note: Demonstrations can be done with the help of models, charts and histological slides

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C,Guyton and John.E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S.A

Semester		Second (2nd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT205-21	Allied Health Sciences	Core Practical/ Lab	Basics of Physiology-II	0	0	4	0	60	40	100	2

Pre-requisite: -

Course Objectives: -

To make the students learn practical aspects of human physiology.

Course Outcomes: -

CO1 - Students will be able to learn the basic functions of cells, tissues, blood and understand physiology of human body.
CO2 - Students will understand the structure and function of organs and organ systems in normal human body.

Sr. No.		Hours
1.	To Examine Cranial nerve	2
2.	To Examine Photo pupillary reflex	2
3.	To Examine Deep tendon reflex	2
4.	To Examine Superficial Reflex	2
5.	To Examine Sensory system	2
6.	To Examine the Motor system	2
7.	To Examine Eye Reflex	2
8.	To study Histology slides of Different types of Muscle tissue	2
9.	To identify the Urinary System organs using models and describe the function of the kidney	2
10.	To Examine Hearing	2

Reference Books

S.No.	Author(s)	Title of the Book	Publisher/Year
1	Ross & Wilson Anatomy and Physiology	Anne Waugh, Allison Grant	Churchill Livingstone
2	Principles of Anatomy & Physiology	Tortora & Bryan	WILEY
	Kathleen J.W. Wilson	Anatomy and Physiology in Health and Illness	Churchill Livingstone, New York
4	Arthur C,Guyton and John.E	Text book of Medical Physiology	Hall. Miamisburg, OH, U.S.A

Semester		**Second (2nd)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT206-21	Allied Health Sciences	Core Practical/ Lab	Basics of Biochemistry-II	0	0	4	0	60	40	100	2

Pre-requisite: -

Course Objectives: -

To make the students learn practical aspects of biochemistry.

Course Outcomes: -

CO1 - Students will be able to learn the terminology of the subject and basic knowledge of basic chemistry and biochemistry involved in physiology of human body.

CO2 - They will be able to understand the reports generated by laboratory and shall be able to convey the surgeon about any critical alert.

Sr. No.	
I	To visit Clinical biochemistry laboratory What test are bein performed i b. Basics of variou routine laborato To understan 1. Liver function tests 2. Renal function tests 3. Urine sugar and protein level

Analysis of Normal
Urine Composition
of urine
Procedure for routine screening
Urinary screening for inborn errors of
metabolism Common renal disease
Urinary calculus
Urine examination for detection of abnormal
constituents Interpretation and Diagnosis
through charts
Liver Function
tests Lipid
Profile Renal
Function Test
Cardiac markers
Blood gas and Electrolytes

Semester		Second (2nd)									
Course Code	Group	Course Type	Course Name / Title	Lord Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
EVS102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Environmental Studies	2	0	0	0	40	60	100	1

Pre-requisite: -

Course Objectives: -

To learn the basics of environmental issues at local and national level through literature and general awareness.

Course Outcomes: -

CO1 - Students will enable to understand environmental problems.
CO2 - The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to explore the possibilities to mitigate these problems.
CO3 - Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.
CO4 - Students will gain practical knowledge by visiting wildlife areas and environmental institutes.

Unit		
I	Introduction to Environmental Studies Multidisciplinary nature of Environmental Studies: Scope & Importance Need for Public Awareness Ecosystems Concept of an Ecosystem: Structure & functions of an ecosystem (Producers, Consumers & Decomposers) Energy Flow in an ecosystem: Food Chain, Food web and Ecological Pyramids Characteristic features, structure & functions of following Ecosystems: • Forest Ecosystem • Aquatic Ecosystem (Ponds, Lakes, River & Ocean)	4
II	Natural Resources Renewable & Non-renewable resources Forest Resources: Their uses, functions & values (Biodiversity conservation, role in climate change, medicines) & threats (Overexploitation, Deforestation, Timber extraction, Agriculture Pressure), Forest Conservation Act Water Resources: Their uses (Agriculture, Domestic & Industrial), functions & values, Overexploitation and Pollution of Ground & Surface water resources (Case study of Punjab), Water Conservation, Rainwater Harvesting, Land Resources: Land as a resource; Land degradation, soil erosion and desertification. Energy Resources: Renewable & non-renewable energy resources, use of alternate energy resources (Solar, Wind, Biomass, Thermal), Urban problems related to Energy	8
III	Biodiversity & its conservation Types of Biodiversity: Species, Genetic &Ecosystem India as a mega biodiversity nation, Biodiversity hot spots and biogeographic regions of India Examples of Endangered & Endemic species of India, Red data book Environmental Pollution & Social Issues Types, Causes, Effects & Control of Air, Water, Soil & Noise Pollution Nuclear hazards and accidents & Health risks Global Climate Change: Global warming, Ozone depletion, Acid rain, Melting of Glaciers & Ice caps, Rising sea levels Environmental disasters: Earthquakes, Floods, Cyclones, Landslides	8
IV	Field Work Visit to a National Park, Biosphere Reserve, Wildlife Sanctuary Documentation & preparation of a Biodiversity (flora & fauna) register of campus/river/forest Visit to a local polluted site: Urban/Rural/Industrial/Agricultural Identification & Photography of resident or migratory birds, insects (butterflies) Public hearing on environmental issues in a village	16

Reference Books

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R.1993. This Fissured Land: An Ecological History of India. Univ. of

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California Press.
3. Gleeson, B. and Low, N. (eds.) 1999.Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll.Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36--- 37.
7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29--- 64). ZedBooks.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971.Fundamentals of Ecology. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012.Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
19. Wilson, E. O. 2006.The Creation: An appeal to save life on earth. New York: Norton.
20. World Commission on Environment and Development. 1987.Our Common Future. Oxford University Press.

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SYLLABUS OF SEMESTER 3rd

Semester		Third (3rd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT301-22	Allied Health Sciences	Core Theory	Anatomy and Physiology of Cardiovascular System	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning and understanding and evaluating and issues with the general anatomical structures of the human body.

Course Outcomes: -

CO1 - The objective of studying CVS is to learn the gross anatomy and structural features of cardiac chambers along with their functions.

CO2 - Students will understand various aspects of coronary vascular system.

CO3 - Students will learn various mechanism of contraction and relaxation.

UNIT- I:

- **Anatomy of the heart and great vessels**

UNIT II:

- **Gross anatomy and structural features of cardiac chambers**
  - Atrium
  - Ventricle
  - AV junction
  - Heart valves
  - Specialized conduction tissues
- **Conduction system**
  - Sinus node
  - Internodal tracts
  - AV node
  - Bundle of His
- **Systemic circulation**
  - Arterial system
  - Venous system
  - Lymphatic system
  - Tissue perfusion and microcirculation
- **Pulmonary circulation**
  - Pulmonary artery
  - Pulmonary veins
  - Bronchial artery
  - Cerebral circulation
  - Renal circulation

UNIT- III:

1. Innervations of the heart

- Sympathetic
- Parasympathetic
- Sensory

2. coronary vascular system

- Coronary arteries
- Myocardial capillary bed
- Venous drainage
- Lymphatic drainage

3. Cardiac cycle

- Mechanical events
- Heart sounds

4. Cardiac output
• Assessment of cardiac output
• Fick principle
• Thermal dilution and indicator dilution methods
Cardiac excitation and contraction
• Mechanism of contraction
• Nodal electricity

5. Hematology and coagulation physiology of blood components
• Blood groups
• Blood transfusion
• Hemostasis

Practicals:
To study the anatomy and physiology of heart and its parts.

Reference Books (latest edition)
1. Basic Pathology Robbins Saunders an imprint of Elsevier Inc., Philadelphia, USA

2. Text book of Pathology Harsh Mohan Jaypee Brothers, New Delhi

3. Practical Pathology P. Chakraborty, Gargi Chakraborty New Central Book Agency, Kolkata

4. Text Book of Hematology Dr. Tejinder Singh Arya Publications, Sirmour (H.P)

5. Text Book of Medical Laboratory Technology Praful Godkar, Bhalani Publication House, Mumbai

6. Text Book of Medical Laboratory Technology RamanikSood

Semester		Third (3rd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT302-22	Allied Health Sciences	Core Theory	Applied Microbiology	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning and understanding various healthcare associated in infections.

Course Outcomes: -

CO1 – To understand the importance and various aspect of sterilization and disinfection**.**

CO2 – To learn about varieties of bacteria resistant to drug.

CO3 – To understand various healthcare associated in infections.

Unit I.

Sterilization and disinfection, Sterilization and disinfection - classification, principle, methods, Central sterile supply department

Unit II.

Importance of sterilization and disinfection, Disinfection of instruments used in patient care, Disinfection of patient care unit, Infection control measures for ICUs

Unit III.

Health care associated infections, Surgical site infections, Urinary tract infections, Ventilator associated pneumonia, Catheter associated blood stream infections, Antibiotic associated diarrhea.

Unit IV.
Drug resistant bacteria, MRSA, VRE, Drug resistant Gram-negative bacteria

Occupationally acquired infections and its prevention, Respiratory route - Tuberculosis, Varicella zoster virus, Influenza, RSV, Blood borne route - HIV, HBV, HCV, CMV, Ebola, Orofecal route - Salmonella, Hepatitis A, Direct contact - Herpes virus

Practicals:
1. Sterilization and disinfection practices in tertiary care hospital
2. Quality control of sterilization and Interpretation of results of sterility testing
3. Collection of specimens from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing.

Recommended Books:

- Textbook of Microbiology by Ananthnarayan and paniker

- Textbook of hospital infection control by Purvamathur

- Textbook of Microbiology by Baveja

- Hospital infection control by Mayhall

Semester		Third (3rd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT303-22	Allied Health Scienc Es	Core Theory	General Pharma cology	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning and understanding safe and effective use of drugs for disease treatment in human being.

Course Outcomes: -

CO1- To study pharmacokinetics and pharmacodynamics of drugs used to treat various diseases and disorders.

CO2 – To understand the importance of drugs along with their safe and effective use for disease treatment in human being.

Unit I - General Pharmacology

a) Absorption, distribution, metabolism and elimination of drugs, routes of drug administration.

b) Basic principles of drug action.

c) Adverse reactions to drugs.

d) Factors modifying drug response.

Autonomic nervous system & Peripheral nervous system

a) Neurohumoral transmission

b) Sympathetic nervous system - sympathomimetics, sympatholytic

c) Parasympathetic - Cholinergic, Anticholinergics, Ganglion stimulants and blockers

d) Skeletal muscle relaxants

e) Local anesthetics

Unit II - Central nervous system

a) General principles - neurotransmitters, definition and common transmitters

b) Drug therapy of various CNS disorders like epilepsy, depression, Parkinson's disease, schizophrenia, neuro- degeneration etc.

c) Pharmacotherapy of pain

d) General anesthetics

e) Drugs for arthritis & gout

Autacoids

a) Histamine and antihistaminic

b) Prostaglandins, leukotrienes, thromboxane and PAF

c) Substance P, bradykinin

Unit III - Cardiovascular system

a) Drug therapy of hypertension, shock, angina, cardiac arrhythmias

b) Renin angiotensin system

c) Diuretics

d) Coagulants and anticoagulants, antiplatelet drugs

e) Hypo-lipidemic

Unit IV- Gastrointestinal and respiratory system

a) Emetics and antiemetics

b) Drugs for constipation and diarrhea

c) Drug treatment of peptic ulcer

d) Drug therapy of bronchial asthma

e) Pharmacotherapy of cough

Hormones

a) Drug therapy of Diabetes

b) Thyroid hormones

c) Pituitary-hypothalamic axis

d) Corticosteroids

e) Oxytocin and drugs acting on uterus

f) Drugs affecting calcium balance

Chemotherapy

a) General principles of antimicrobial chemotherapy, rational use of antibiotics

b) Chemotherapeutic agents - b- Lactam Antibiotics, fluoroquinolones, macrolides, aminoglycoside, tetracyclines, chloramphenicol and polypeptide antibiotics.

c) Chemotherapy of tuberculosis,

d) Cancer Chemotherapy

Miscellaneous

a) Immunomodulators

b) Drug therapy of glaucoma and cataract

c) Treatment of poisoning

PRACTICALS

A) Experimental exercise on pharmacy

a) General principles of pharmacy

b) Prescription writing exercises

c) Preparation and dispensing of powders, emulsions ointments, mixtures, liniments, suppositories and syrups

B) Spotting exercise - Identify the commonly used items in Pharmacology

C) Exercises on drug interactions

Semester		Third (3rd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT304-22	Allied Health Sciences	Core Theory	Electrocardiography (ECG)	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning in handling instruments and understand basic principle of ECG.

Course Outcomes: -

CO1 – To understand basic principle of ECG.

CO2 – To be able to recognize the normal PQRS waves and their significance in normal cardiac function.

CO3 – To achieve expertise in handling instruments used in critical cardiac care.

Unit I - Basic ECG

i) Basic principles of ECG - The Electrocardiographic paper

- The Electrocardiograph
- The Electrical field of Heart
- The leads. standard limb lead, Pericardial lead, 'V' lead & 'AV' lead
- Basic ECG deflections.

ii) Normal ECG

- The 'P' wave
- The 'QRS' complex
- T wave, the S-T segment, P-R segment
- The 'U' wave
- Rate & rhythm
- Rotation of the heart, The Q-T interval.

Unit II

- iii) The Electrical axis
- iv) Pericardial pattern of ECG
- v) Chamber enlargement-atrial enlargement, LV hypertrophy & RV hypertrophy

Unit III

- Echocardiography

* Basic principles of ultrasound

* M-Mode Echocardiography

* Two-dimensional Echocardiography

* Doppler Echocardiography, color flow

* Transesophageal Echocardiography

Unit IV - Instrumentation:

* Basic pulse Echo system

* Transducers

* Pulse generation

* Echo detection

* Echo displays

* A mode, B mode, M-mode

* Display & recording

PRACTICALS / DEMONSTRATION:

• ECG spotters of all cardiac disease conditions

• Right atrial enlargement

• left atrial enlargement

• Right Axis deviation

- Left Axis deviation
- Hypertrophy
- Arrhythmias

a. Sinus rhythm, Sinus bradycardia and tachycardia

b. Ventricular tachycardia

c. Ventricular flutter

d. Ventricular fibrillation

- Pulse oximeter
- ABG

Semester		Third (3rd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT305-22	Allied Health Sciences	Core Theory	Life Style Diseases	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning and understanding cardiac diseases along with the diagnosis and treatment.

Course Outcomes: -

CO1 – To understand the prevalence causes and prevention of cardiovascular diseases and other lifestyle diseases.

CO2 – To understand signs and symptoms of cardiac diseases along with the diagnosis and treatment.

Unit I.

- Prevalence, causes and prevention of cardiovascular diseases: a) IHD b) RHD C) Hypertension d) CHD
- Heart failure: Causes, Types, symptoms and signs, diagnosis, management, prevention.
- Arrhythmias: Brady and Tachyarrhythmia's, causes, diagnosis and management.
- Atherosclerosis: Definition, risk factors, pathogenesis, Clinical significance and prevention.

Unit II.

- Coronary artery disease: Types, Causes, Symptoms and signs, diagnosis, investigations, management, complications.
- Hypertension: Definition, causes, signs and symptoms, diagnosis, evaluation, management.

Unit III.

- Pulmonary Hypertension: Definition, Causes, diagnosis and treatment.
- Rheumatic fever, Rheumatic Heart disease, Mitral valve and aortic valve disease. Infective endocarditis.
- Congenital Heart Diseases: Common CHD, Diagnosis and management ASD, VSD, PDA, PS, AS, Coarctation of aorta, Dextrocardia.

Unit IV.

- Cardiomyopathies: Dilated Cardiomyopathy, Hypertrophic Cardiomyopathy, Restrictive Cardiomyopathy
- Pericardial diseases: Acute Pericarditis, Pericardial effusion, Pericardial tamponade.
- Chronic constrictive pericarditis
- Peripheral vascular diseases
- Anemia
- Acute and chronic renal failure
- Fluid therapy, Central venous lines. Interpretation of Investigation reports.

PRACTICALS:

Case Studies of life styles diseases

1. History Taking and clinical examination, monitoring of patient.
2. Therapeutic options for various diseases and conditions

Reference Books (latest edition)

1. Basic Pathology Robbins Saunders an imprint of Elsevier Inc., Philadelphia, USA

2. Text book of Pathology Harsh Mohan Jaypee Brothers, New Delhi

3. Practical Pathology P. Chakraborty, Gargi Chakraborty New Central Book Agency, Kolkata

4. Text Book of Hematology Dr. Tejinder Singh Arya Publications, Sirmour (H.P)

5. Text Book of Medical Laboratory Technology Praful Godkar, Bhalani Publication House, Mumbai

6. Text Book of Medical Laboratory Technology Ramanik Sood

Signature of Convenor (BOS) Signature of Chairman (BOS)

Semester		Third (3rd)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT311-22	Allied Health Sciences	Core Theory	Non-invasive Diagnosis Cardiovascular system	2	0	0	0	40	60	100	2

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning and understanding non-invasive diagnostic modalities used to detect coronary artery disease.

Course Outcomes: -

CO1 - To evaluate differences in downstream testing, coronary revascularization, and clinical outcomes following non-invasive diagnostic modalities used to detect coronary artery disease.

CO2 - To understand the impact that narrowing's and blockages have on blood flow to your heart.

CO3 – To comprehend the steps of ECG interpretation including the properties of a normal sinus rhythm.

Unit I –
Noninvasive

- Technique of ECG recording
- ECG Leads system
- ECG waves - PQRSTU, Osborn wave, delta wave, epsilon wave.
- ECG rates, rhythm, axis calculation, lead positioning.
- Intervals and segments - PR interval, PR segment, ST segment, QT interval, J point and QRS complex.

Unit II

- ECG anatomy - Chambers enlargement.
- Technical artefacts
- ECG reporting Exercise Testing to Diagnose Obstructive Coronary Artery Disease - Rationale and Guidelines, Pretest Probability (true positive, false positive, true negative and false negative ST-Segment Interpretation, Confounders of Stress ECG Interpretation.

Unit III –
Noninvasive Echocardiography -

- Introduction and purposes, demonstration of machine parts,
- Basic windows
- Echocardiographic views

Unit IV-

- Imaging modes - two-dimensional (2D) imaging, M-mode imaging, and Doppler imaging, color - flow mapping.

4th SEMESTER

Semester		Third (4th)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT401-22	Allied Health Sciences	Core Theory	Basic Patient care	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives: -

The Course aims to provides a learning and understanding about asepsis, and the cleanliness related to asepsis and on mobility of the patients.

Course Outcomes: -

CO1 – To Measure Vital Signs, do basic physical examination of the patients, NG tube basics, Administration of Medicines.

CO2 - The students will learn about asepsis, and the cleanliness related to asepsis and on mobility of the patients.

CO3 - To understand the basic ideas on how to check for vital Signs of the patient.

Unit I

Introduction, Communication and Documentation - **Introduction to Patient Care:** Principles of patient care. Types of patients (gender, age, diseases, severity of illness, triage). **Communication & Documentation:** Communication with doctors, colleagues and other staffs. Non-verbal communication, Inter-personnel relationships. patient contact techniques, communication with patients and their relatives,
Documentation: Importance of documentation, initial and follow up notes; documentation of therapy, procedures and communication

Unit II

Universal Precautions sand Infection Control - **Universal Precautions and Infection Control:** Hand washing and hygiene, Injuries and Personal protection, Insulation and safety procedures, Aseptic techniques, sterilization and disinfection, Disinfection and Sterilization of devices and equipment, Central sterilization and supply department, Biomedical Medical waste management

Unit III

Medication Administration and Transport of patient -**Medication Administration:** Oral/Parenteral route, Parenteral medication administration: Intra venous, intra muscular, sub-cutaneous, intra dermal routes, Intra venous Infusion, Aerosol medication administration, Oxygen therapy, Intravenous fluids, Blood and blood component transfusion.

Position and Transport of patient: Patient position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep. Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher. Transport of ill patients (inotropes, intubated / ventilated patients)

Unit IV

Bedside care and monitoring-Bedside care: Methods of giving nourishment: feeding, tube feeding, drips, transfusion. Recording of pulse, blood pressure, respiration, saturation and temperature. Bed side management: giving and taking bed pan, urine container. Observation of stools, urine, sputum, drains. Use and care of catheters and rubber goods. Care of immobile/bed ridden patients, bed sore and aspiration prevention

Monitoring of Patient: Pulse, ECG (Cardiac Monitor), Oxygen Saturation, Blood Pressure, Respiration, Multi parameter monitors, Capnography and End Tidal CO2 (ETCO2), Hydration, intake and output monitoring ventilator parameters: Respiratory Rate, Volumes, Pressures, Compliance, Resistance.

Dressing and wound care: Bandaging: basic turns, bandaging extremities, triangular bandages and their application. Surgical dressing: observation of dressing procedures. Suture materials and suturing techniques**,** Splinting**.** Basic care of patient with burns.

PRACTICALS

1. Demonstration of Patient care Procedures:

a) Positioning of patient, transport of the patient, Dressing and Bandaging, Care of inter costal drain tube, Insertion of naso-gastric tube and feeding
b) Phlebotomy and obtaining blood samples, Arterial Blood sampling for ABG
c) Injections: intra muscular, intra venous, sub cutaneous, intra dermal
d) Insertion of intra venous catheter and infusion of medications, blood transfusion
e) Recording of ECG and monitoring of patient
f) Oxygen therapy: oxygen cannula, masks. Aerosol therapy: nebulization, inhalers
g) Suctioning and care of artificial airway
h) Insertion of urinary bladder catheter
2. Uses, principles, advantages and disadvantages of instruments and Devices in patient care
3. First aid and Basic Life Support (BLS)

{Practical: Spotters, Drugs, Instruments and devices - identification and usage, demonstration of patient care procedures.}

Reference Books:

2. Principles and practice of Nursing - Sr Nancy

3. Introduction to Critical Care Nursing - Mary Lou Sole

4. First Aid - Red cross society guidelines

5. Basic Life Support (BLS) - American Heart Association guidelines

Semester		Third (4th)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT402-22	Allied Health Sciences	Core Theory	Basics Cardiac Evaluation	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives :-

The Course aims to provides a learning and understanding about new techniques for procedures in and around the heart and various heart diseases.

Course Outcomes :-

CO1 - To enable students, understand new techniques for procedures in and around the heart and various heart diseases.

CO2 - To understand such interventions which include diagnostic and therapeutic electrophysiology; implantation or exchange of complex pacemaker

systems or percutaneous cardio-vertex defibrillator-pacers; percutaneous valve repairs or replacements etc.

Unit I

Heart diseases and related disorders

- Ischemic heart disease
- Rheumatic heart disease
- Congenital heart disease
- Arrhythmias
- Peripheral vascular disease
- Pericardial disease
- Shock state
- Cardiomyopathy
- Hypertension, diabetes, dyslipidemias
- Infective endocarditis
- Heart failure
- Pulmonary hypertension and embolism

Unit II

Cardiovascular investigations: Noninvasive

- ECG - cardiac diagnosis by ECG: Chambers enlargement, arrhythmias, myocardial ischemia and infarction.
- Echocardiography - cardiac diagnosis: valvular heart diseases, myocardial diseases, ischemic heart diseases, Cardiomyopathies
- Pulmonary hypertension, infective endocarditis, intracardiac masses.
- Stress test- treadmill test review, pharmacological stress testing.
- 24 hours Holter monitoring
- Ambulatory BP monitoring
- Tilt table test
- Ankle-Brachial Index

Unit III

A. Cardiovascular pharmacological therapies

- Antiplatelets
- Anticoagulants
- Antiarrhythmic
- Antihypertensive
- Intravenous fluids
- Atropine
- Inotropic
- 2B 3A receptors blocking agents
- Diuretics
- Nitrates
- miscellaneous

B. Cardiovascular interventional therapies

- Coronary angioplasty
- Peripheral angioplasty
- Mitral valvoplasty
- Pulmonary and aortic valvoplasty
- Device closures
- Pacemakers
- Pericardiocentesis
- Myocardial biopsy
- Retrieval of foreign bodies
- Clot aspiration

Unit IV

Cardiovascular investigations: Invasive

- Diagnosis of coronary artery disease
- Diagnosis of valvular heart diseases in the Cath-lab - stenosis, regurgitation and mixed
- Diagnosis of shunts
- Evaluation of pulmonary hypertension
- Diagnosis of pericardial constriction
- Diagnosis of peripheral and aortic diseases
- Complications of cardiac catheterization

PRACTICALS:

Noninvasive Technology;

a) ECG recording basic

b) ECHO evaluation basic
c) Preparation for treadmill test
d) Preparation for 24 hours Holter monitoring
e) Preparation for ABPM

Invasive Technology;

a) Cardiac Cath right Heart
b) Cardiac Cath Left Heart
c) Cardiovascular Angiography
d) Cardiac Pacing
e) Relevant instrumentation in Cath Lab
f) Cardiac Emergencies in Cath Lab

Semester		Third (4th)									
Course Code	Group	Course Type	Course Name / Title	Load Allocation				Marks Distribution		Total Marks	Credit
				Lecture	Tutorial	Practical	Studio (If Applicable)	Internal	External		
BCCT403-22	Allied Health Sciences	Core Theory	Cardiac Catheterization	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives :-

The Course aims to provides a learning and understanding Cardiac Catheterization.

Course Outcomes :-

CO1 - The students will gain knowledge about chances of a successful procedure.

CO2 - To enable students, understand about benefit/risk to the patient if the procedure is successful/ unsuccessful.

CO3 - The occurrence and management of various complications.

Unit I

- Preparation for Cath procedure and post procedure care.
- Cardiac Catheterization laboratory- General details of Cardiac Catheterization

equipment, how to handle the machine, common problems, one may come across and how to overcome it. Radiation hazards.

- Materials used in the Cath Lab- All catheters, balloons, guidewires, pacemakers, contrast materials & other materials used in the Cardiac Catheterization Laboratory and Sterilization of all these materials.

Unit II

- Right heart Catheterization- procedure, Cath position, Oximetry at various levels, Angio's done & its interpretation.
- Left heart catheterization- procedure, Cath position, Oximetry at various levels, Angio's done & its interpretation.
- Coronary Angiogram-procedure, materials used, type & amount of dye used, indications & contra indications, various pictures recorded in various angles and gross interpretation.
- Peripheral Angiogram- procedure, indication & contra indication.
- Coronary Angioplasty- procedure, materials used, complications one may encounter and how to manage it.

Unit III

- Peripheral Angioplasty- materials used & procedure. Angioplasty of coarctation of aorta
- Valvuloplasty's- procedure, indications, complications and preparation of balloons, mitral valvuloplasty, balloon aortic valvuloplasty, Balloon pulmonary valvuloplasty& Balloon tricuspid valvuloplasty,
- Coil closure & device closure of PDA- procedure, indications & materials used for coil & device closure of PDA
- Device Closure of ASD- procedure, indications & materials used for device closure of AS
- Device Closure of VSD procedure, indications & materials used for & device closure of VSD

Unit IV

- Electrophysiological studies-basic knowledge of electrophysiological studies.
- Oximetry – handling of the instruments & use fullness of the instruments, normal & abnormal values.
- Pressure recording- handling of the instrument & pressures in various chambers, normal & abnormal values.
- Temporary & permanent pacing- materials used, procedure, complications one may encounter & management.
- CD recording & storage- Recording & storage of all the procedures over CD.
- Procedure during pregnancy- precautions to be followed.

- Nuclear cardiology- instrumentation, radiopharmaceuticals, patient imaging techniques

PRACTICAL -

a) Sterilization techniques
b) Hardware's used in Cardiac Catheterization
c) Procedures involved in Cardiac Catheterization

Semester		**Third (4th)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Load Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT404-22	Allied Health Sciences	Core Theory	Cardiac Medical Instrumentation	3	1	0	0	40	60	100	4

Pre-requisite: -

Course Objectives :-

The Course aims to provides a learning and understanding about medical equipment.

Course Outcomes :-

CO1 – To introduce the student to the various sensing and measurement devices of electrical origin.

CO2 - To bring out the important and modern methods of imaging techniques.

CO3 - To provide awareness of electrical safety of medical equipment.

CO4 - To provide the latest ideas on devices of non-electrical devices.

CO5 - To provide latest knowledge of medical assistance / techniques and therapeutic equipment.

Unit I

- Cardiac Angiography
- Blood pressure recording
- Medical ultrasound and Doppler

Unit II

- Ionic currents and Electrocardiography
- ECG Machine
- Patient monitor
- Stress Test Machine

Unit III

- Central Monitoring System
- Sphygmomanometer
- Pulse Oximeter
- Stethoscope

Unit IV

- Defibrillators
- Pressure transducers
- Techniques of monitoring radiation exposure
- Computer use in medical care and data entry

PRACTICAL ASSESSMENT:

- Spotters
- Video Clips
- Demonstration of common disorders