B.Voc (CARDIAC CARE TECHNOLGY)
B.Voc (CCT)
Year -1 (Diploma)

I Semester				
S.No.	**Course Code**	**Subject**	**Content Type**	**Credit**
1	BVCCT-101	Human Anatomy and Physiology -1	General	4
2	BVCCT-102	General Biochemistry	General	4
3	BVCCT-103	Orientation in para clinic science	Skill	4
4	BVCCT-104	Basic Electrography	Skill	3
5	BVCCT-105	Fundamentals of computer	General	3
6	BVCCT-106	General English and soft skill	General	2
7	BVCCTP-101	Human Anatomy and Physiology -1 Lab	Skill	2
8	BVCCTP-102	General Biochemistry Lab	Skill	2
9	BVCCTP-103	Orientation in para clinic science Lab	Skill	2
10	BVCCTP-104	Basic Electrography Lab	Skill	2
11	BVCCTP-105	Fundamentals of computer Lab	Skill	2
			Total	**30**

II Semester				
S.No.	**Course Code**	**Subject**	**Type of Course**	**Credits**
1	BVCCT-201	Applied anatomy and physiology related to cardiac technology	Skill	4
2	BVCCT-202	Applied biochemistry in cardiac care	Skill	4
3	BVCCT-203	Pharmacology related to cardiac technology	Skill	4
4	BVCCT-204	Medical electronics, biophysics and computer usage relevant to cardiac technology	General	2
5	BVCCT-205	General Microbiology	General	3
6	BVCCT-206	Basics of Health Market & Economy	General	3
7	BVCCTP-201	Applied anatomy and physiology related to cardiac technology Lab	Skill	2
8	BVCCTP-202	Applied biochemistry in cardiac care Lab	Skill	2
9	BVCCTP-203	Pharmacology related to cardiac technology Lab	Skill	2
10	BVCCTP-204	Medical electronics, biophysics and computer usage relevant to cardiac technology Lab	Skill	2
11	BVCCTP-205	General Microbiology Lab	Skill	2
		Internship in Hospital		
			Total	**30**

B.Voc (CARDIAC CARE TECHNOLGY)
B.Voc (CCT)
Year -II Advance Diploma

III Semester				
S.No.	**Course Code**	**Subject**	**Type of Course**	**Credits**
1	BVCCT-301	Pathology related to cardiac care	General	4
2	BVCCT-302	Microbiology related to cardiac care	General	3
3	BVCCT-303	Advanced electrocardiography	Skill	4
4	BVCCT-304	Echocardiography	Skill	3
5	BVCCT-305	Advance Computing skills	General	2
6	BVCCT-306	Human Values & Professional Ethics	General	4
7	BVCCTP-301	Pathology related to cardiac care Lab	Skill	2
8	BVCCTP-302	Microbiology related to cardiac care Lab	Skill	2
9	BVCCTP-303	Advanced electrocardiography Lab	Skill	2
10	BVCCTP-304	Echocardiography Lab	Skill	2
11	BVCCTP-305	Advance Computing skills Lab	Skill	2
			Total	**30**

IV Semester				
S.No.	**Course Code**	**Subject**	**Type of Course**	**Credits**
1	BVCCT-401	Treadmill exercise stress testing and 24 HR Ambulatory ECG Reporting	General	4
2	BVCCT-402	Community Healthcare	Skill	4
3	BVCCT-403	General Medicine and Surgery	Skill	4
4	BVCCT-404	Medical Terminology & Record keeping	General	3
5	BVCCT-405	Health and fitness	General	3
6	BVCCT-406	Advance communication and soft skill	General	2
7	BVCCTP-401	Treadmill exercise stress testing and 24 HR Ambulatory ECG Reporting Lab	Skill	2
8	BVCCTP-402	Community Healthcare Lab	Skill	2
9	BVCCTP-403	General Medicine and Surgery Lab	Skill	2
10	BVCCTP-404	Medical Terminology & Record keeping Lab	Skill	2
11	BVCCTP-405	Health and fitness Lab	Skill	2
		Internship in Hospital		
			Total	**30**

B.Voc (Cardiac care technology)
B.Voc (CCT)
Year –III(Degree)

V Semester				
S.No.	**Course Code**	**Subject**	**Type of Course**	**Credits**
1	BVCCT-501	Cardiac Catheterization Laboratory Basics	Skill	4
2	BVCCT-502	Quality Control & patient Safety	Skill	3
3	BVCCT-503	Bio- Statics	General	3
4	BVCCT-504	Medical Ethics & Patient Care	General	4
5	BVCCT-505	Digital literacy and account literacy	Skill	3
6	BVCCT-506	Introduction to national healthcare system	General	3
7	BVCCTP-501	Cardiac Catheterization Laboratory Basics Lab	Skill	2
8	BVCCTP-502	Quality Control & patient Safety Lab	Skill	2
9	BVCCTP-503	Bio- Statics Lab	Skill	2
10	BVCCTP-504	Medical Ethics & Patient Care Lab	Skill	2
11	BVCCTP-506	Introduction to national healthcare system Lab	Skill	2
			Total	**30**

VI Semester				
S.No.	**Course Code**	**Subject**	**Type of Course**	**Credits**
1	BVCCT-601	Cardiac Catheterization Laboratory Advance	Gen	6
2	BVCCTP-601	Cardiac Catheterization Laboratory Advance Lab	Skill	4
3	BVCCTP-602	Internship in hospital	Skill	10
4	BVCCTP-603	Project in Hospital	Skill	10
			Total	**30**

BVCCT- 101-Human Anatomy and Physiology I

[redacted]

Terminology and General Plan of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections, Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division.

UNIT-2

Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue The Integumentary System: structure and function of The Skin, Subcutaneous Tissue, Musculoskeletal System: Basic anatomy of important muscles and bones.

UNIT-3

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

UNIT-4

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation

BVCCT-102-General Biochemistry

UNIT 1

Carbohydrates- Glucose; fructose; galactose; lactose; sucrose; starch and glycogen (properties and tests, Structure and function), Metabolism of carbohydrate,

UNIT 2

Proteins -Amino acids, peptides, and proteins (general properties & tests with a few examples like glycine, tryptophan, glutathione, albumin, hemoglobin, collagen)

UNIT 3

Lipids- Fatty acids, saturated and unsaturated, cholesterol and triacylglycerol, phospholipids and plasma membrane

UNIT 4

Vitamins -General with emphasis on A, B2, C, E and inositol (requirements, assimilation and properties)

Minerals--Na, K, Ca, P, Fe, Cu and Se (requirements, availability and properties)

UNIT 5

Nucleotides and nucleic acids DNA, Replication Organ function test: LFT, KFT, Gastric function test, Cardiac function test.

BVCCT-103-Orientation in Para Clinic Science

UNIT-1

Entamoeba Histolytica, Leishmania, Material Parasites of man, Helminthology Taenia Saginata, Taenia Soleum,

UNIT-2

Echinococcus granulosus, Ascaris Lumbricoides ancylostoma Duodenale Strong ylides stercoralis.

UNIT-3

General Properties of Virus, Herpes virus, Poliovirus, Hepatitis virus, Onco Generic Virus, HIV

UNIT-4

Inflammation, Neoplasia, Osteomyelitis, Fractures, Osteoporosis, Rickets.

BVCCT-104-Basic Electrography

UNIT-1

Fundamental principles of electrocardiography: Cardiac electrical field Generaleration

during activation, Cardiac wave fronts Cardiac electrical field Generaleration during ventricular recovery

UNIT-2

Electrocardiographic lead systems: Standard limb leads, Precordial leads and the Wisdom

central termina, Augmented limb leads.

The hexaxial reference frame and electrical axis

Recording adult and pediatric ECGs

UNIT-3

The normal electrocardiogram, Atrial activation

The normal P wave Atrial repolarization

Atrioventricular node conduction and the PR segment Ventricular activation the QRS complex Ventricular recovery and ST-T wave, U wave Normal variants, Rate and rhythm

BVCCT-105-Fundamental of Computers

Unit-1

Introduction to Computers

History of Computer, Generations, Characteristics, Advantages and limitations of Computer, Classification of Computers, Functional Components of Computer, input, Output and Processing, Concept of Hardware and Software, Data & Information. Concept of data storage. Number system. Decimal, Binary, Hexadecimal ASCII.

UNIT-2

Introduction to GUI Based Operating System Basics of Operating system, Basics of DOS & LINUX, The User interface, File and directory management, Windows setting, Control Panel, devices and Printer setting, Using various window commands for desktop.

UNIT-3

Word Processing

Word processing basics, Menu Bar, Opening and closing documents, save & save as, Page setup, print preview, and printing. Text creation and manipulation Editing, cut copy paste. Document creation, editing, Formatting the text – Paragraph indenting, bullets and numbering, changing case, Table manipulation – creation of table, insertion and deletion of cell, row and column.

UNIT-4

Network basics, Internet Basics of computer network LAN, WAN etc, Concept of Internet, Basic of Internet Architecture, Services on Internet Architecture, World wide web and websites, Communication on Internet, Internet Services, Preparing Computer for Internet Access, ISPs and Examples, Internet Access Technologies. Web Browsing, configuring web browser, Popular search engines Downloading and printing web pages. Internet application Basics of E-mail, E-mail addressing, forwarding and searching, Composing.

BVCCT-106-GENERAL ENGLISH AND SOFT SKILL

Unit-1 Introduction to English language

a) Role and significance of English language in the present scenario

b) English language: its relevance for the Indian industry.

c) Introduction to listening, speaking, reading, writing and bench marking of the class.

Unit 2: Grammar and usage

Verbs

Determiners

Active Voice and Passive Voice

Tenses

Unit 3:

Letter writing & Notice Writing

Unit 4:

Précis and Report writing

Practical Knowledge

English communication Concept:

a) About myself, my family and my friends

b) Let's talk, making conversation, meeting and greeting

c) My opinions, my likes and dislikes

d) Life at collage, hostel and workplace: Conversation test

PRACTICALS:

BVCCTP 101.PRACTICAL ANATOMY AND PHYSIOLOGY

Human anatomy (practical)

Demonstration of

- Study of Human Skeleton parts with skeletal models.
- Study with charts and models of all organ systems mentioned above.
- Microscopic slides examination of elementary human tissues, cells.
- Major organs through models and permanent slides.
- Parts of circulatory system from models.
- Parts of respiratory system from models.
- Digestive system from models.

Excretory system from models.

Human Physiology (Practical)

- To measure pulse rate
- To measure blood pressure
- To measure temperature
- Measurement of the Vital capacity
- Determination of blood groups
- Transport of food through esophagus
- Calculation and evaluation of daily energy and nutrient intake.
- Measurement of basal metabolic rate
- Demonstration of ECG
- Bile juice secretion and execration 11. Urine formation and execration

BVCCTP-102-PRACTICAL BIOCHEMISTRY

- 1. Analysis of Normal Urine
- 2. Liver Function tests
- 3. Lipid Profile
- 4. Renal Function test
- 5. Blood gas and Electrolytes

- 6. Demonstration of Glucometer with strips

BVCCTP-103-Practical Orientation in para clinic science

- Know the diagnostic techniques used in pathology
- Know the various categories of the causes of diseases
- Know the course, outcome, consequences of diseases
- Compound Microscope
- Dark ground Microscopy
- Measurement of Microorganisms
- Hanging drop Preparation
- Isolation of Pure Cultures
- Bacterial Staining
- Simple Staining
- Gram's Staining
- Acid Fast Staining
- Albert's Staining
- Capsule Staining

BVCCTP-104- Practical Basic electrography

Demostration of :

- electrocardiography
- Cardiac wave fronts
- Cardiac electrical field Generaleration during ventricular recovery
- Electrocardiographic lead systemscentral termina, Augmented limb leads,The normal electrocardiogram, Atrial activation,The normal P wave Atrial repolarization,Atrioventricular node conduction and the PR segment Ventricular activation
- activation and the QRS complex

- Ventricular recovery and ST-T wave, U wave Normal variants
- Rate and rhythm

BVCCTP-105- PRACTICAL FUNDAMENTALS OF COMPUTER

- Starting MS WORD, Creating and formatting a document,
- Changing fonts and point size,
- Table Creation and operations, Autocorrect, Auto text, spell Check, Word Art, Inserting
- objects, Page setup, Page Preview, Printing a document, Mail Merge.
- Starting Excel, Work sheet, cell inserting Data into Rows/ Columns, Alignment, Text
- wrapping , Sorting data, Auto Sum, Use of functions, referencing formula cells in other
- formulae , Naming cells, Generalerating graphs, Worksheet data and charts with WORD, Creating
- Hyperlink to a WORD document , Page set up, Print Preview, Printing Worksheets.
- Starting MS–Power Point,, Creating a presentation using auto content Wizard, Blank
- Presentation, creating, saving and printing a presentation, Adding a slide to presentation,
- Navigating through a presentation, slide sorter, slide show, editing slides, Using Clipart, Word
- art gallery, Adding Transition and Animation effects, setting timings for slide show, preparing
- note pages, preparing audience handouts, printing presentation documents, MS-Access,
- Creating tables and database, Internet, Use of Internet (Mailing, Browsing, Surfing).

II Semester

BVCCT-201-Applied anatomy and physiology related to cardiac technology

UNIT-1

Introduction to Anatomy (Basic Anatomical terminology)

1. Osteology: Upper limb – clavicle, scapula, humorous, radius, ulna. Lower limb - femur, hipbone, sacrum, tibia, fibula, Vertebral column

2. Thorax: Intercostal space, pleura, bony thoracic cage, ribs, sternum & thoracic vertebrae

3. Lungs: Tracheae, bronchial tree

4. Heart: Surface anatomy of heart, chambers of the heart, valves of the heart, major blood vessels of heart, pericardium, coronary arteries.

5. Myology: Muscles of thorax, muscles of upper limb (arm & fore arm), Flexor and extensor group of muscles (origin, insertion, nerve supply, action)

6. Histology: Types of tissue

(a) Epithelia – Squamous, Glandular, Transitional, Cartilage

(b) Connective tissue – bone, fibrous tissue, muscle

UNIT-2

1. Overview of the cardiovascular system: Functions of the cardiovascular system, Circulation of blood, Central control of the cardiovascular system

2. Cardiac cycle: Mechanical events, Arterial cycle and central venous pressure cycle, Clinical aspects of human cardiac cycle

3. Cardiac excitation and contraction: Mechanism of contraction, Sino-atrial node function, the cardiac conduction system, Atrio-ventricular node function. Autonomic regulation of the heart rate

4. Assessment of cardiac output: Fick’s principle, Thermo dilution and indicator dilution methods, Pulse Doppler methods, Miscellaneous methods

5. Hemodynamics: Relationship between pressure, flow and resistance, Frank-Starling law, Preload, after-load and contractility, Control of stroke volume and cardiac output

6. Solute transport between blood and tissues:

UNIT-3

7. Vascular smooth muscle: Mechanism of contraction, Pharmaco-mechanical coupling, automaticity

8. Control of blood vessels: Local control mechanisms, Nervous control, Hormonal control

UNIT-4

9. Specialization in individual circulation: Coronary circulation, cerebral circulation, pulmonary circulation, Cutaneous circulation

10. Cardiovascular receptors, reflexes and central control

11. Coordinated cardiovascular responses: Posture, Valsalva maneuver, Exercise, Diving reflex

12. Cardiovascular responses ion pathological situations: Shock and hemorrhage, Syncope, Essential hypertension, chronic cardiac failure

13. Respiratory physiology: Mechanics of respiration, Principles of gas exchange regulation of respire

14. Hematology and coagulation physiology blood components: Blood groups and blood transfusion, Hemostasis

BVCCT-202- Applied biochemistry in cardiac care

UNIT-1

Biomolecules and the cell: Major complex biomolecules of cell and cell organelles- Prokaryotic and eukaryotic cell

Carbohydrates: Chemical structure, function and Classification: Monosaccharides, Disaccharides, Polysaccharides, Homopolysaccharides, Heteropolysaccharides,Glycoproteins

Proteins: Amino acids, Classification, Structure of proteins, Determination of protein, structure, Properties of proteins, Denaturation, Classification of proteins, AntiGeneral AntibodyTypes

UNIT-2

Plasma proteins, Blood clotting.

Lipids: Chemical structure, functions and Classification, fatty acids, Triacylglycerols, Phospholipids, glycoproteins, Lipoproteins, Steroids, Amphipathic lipids.

Nucleic acids: Purines and pyrimidine, Structure of DNA, Watson & Crick model of DNA,

Structure of RNA, Types of RNA, Enzymes: Definition, Nomenclature, Classification, Factors affecting enzyme activity,

Active site, Coenzyme, Enzyme Inhibition, Mechanism of enzyme action, Units of enzyme,

UNIT-3

Isoenzymes, Enzyme pattern in diseases.

Vitamins & Minerals: Fat soluble vitamins(A,D,E,K), Water soluble vitamins, B-complex

vitamins, principal elements(Calcium, Phosphorus, Magnesium, Sodium, Potassium,

Chlorine and sulphur), Trace elements, Calorific value of foods, Basal metabolic rate(BMR),

UNIT-4

respiratory quotient(RQ), Specific dynamic action(SDA), Balanced diet, Marasmus,Kwasoirkar

Hormones: Classification, Mechanism of action, Hypothalamic hormones, Pitutary– Anterior, posterior; Thyroid – Adrenal cortex, Adrenal medulla; Gonadal hormones, Menstrual cycle, GI hormones

Acids and bases: Definition, pH, Henderson Hasselbach

BVCCT 203-Pharmacology related to cardiac technology

UNIT-1

Anti-anginal generals: Beta blockers- propranolol, atenolol, metoprolol, bisoprolol

carvedilol, esmolol; Nitrates-nitroglycerine, isosorbide dinitrate, isosorbide mononitrate,

transdermal nitrate patches; Calcium channel blockers- nifedipine, verapamil, dilteazem,

amlodipine

UNIT-2

2. Anti-failure aGeneralts: Diuretics-furosemide, torsamide, thiazide diuretics, metolazone,

spironolactone, combination diuretics; Angiotensin cvertying enzyme (ACE) inhibitors – captopril Enalapril, ramipril, lisinopril, ACE inhibitors for diabetics and hypertensive renal

disease; Digitalis and acute ionotropes – digoxin, doubutamine, dopamine, adrenaline,

noradrenaline, isoprenaline

UNIT-3

3. Anti-hypertensive drugs: Diuretics, beta-blockers, ACE inhibitors, calcium antagonists,

direct Vasodilators, centrally acting and peripherally acting vasodilators

4. Anti- arrhythmic aGeneralts: Amiodarone, adenosine, verapamil, diltiazem, lidocaine,

mexiletine, Phenytoin, flecainide, bretylium, atropine

5. Antithrombotic aGeneralts: Platelet inhibitors: aspirin, clopidogrel; Anticoagulants: heparin,

low molecular weight heparin, warfarin; Fibrinolytics: streptokinase, urokinase ;

Glycoprotein 2b3a antagonists: abciximab, tirofiban, eptifibatide

UNIT-4

6. Lipid lowering and anti-atherosclerotic drugs:statins, exetimibe, niacin, fenofibrate

Miscellaneous drugs:

Narcotics: morphine, pethidine, fentanyl

Sedatives: diazepam, midazolam

Steroids: hydrocortisone, prednisolone,

Antihistamines: diphenhydramine

Antibiotics: pecicillins, cephalosporins, aminoglycosides

Anesthetic aGeneralts: local, Generaleral

Antacids and proton pump inhibitors, Protamine

BVCCT-204 -Medical electronics, biophysics and computer usage relevant to cardiac technology

UNIT-1

Introduction to medical physics

Blood pressure recording

Pressure transducers

Defibrillators

UNIT-2

Cathode ray tubes and physiological monitors

Impedence plethysmography

Pulse oximetry

UNIT-3

Medical ultrasound and Doppler

Ionic currents and Electrocardiography

Electrocardiographic processing and display system

Radiation physics

UNIT-4

Techniques of monitoring radiation exposure

Measures to reduce radiation exposure

Computer use in medical care and data entry

BVCCT– 205 General Microbiology

UNIT-1

Introductory microbiology: Introduction to and brief of microbiology, scope and relevance of microbiology, modern developments in microbiology, explain the types and methods of sterilization, use and types of microscopes; bright microscope, field microscopy, dark field microscopy, phase contrast microscopy, electron microscopy.

UNIT-2

Morphology and structure of microorganisms: Morphology and structure of bacteria, fungi, actinomycete and algae etc., microscopic examination of microorganisms, preparation of culture media, spread plates, pour plates, types of selective and differential media, separation of pure cultures, principles and uses of microbiology equipments and instruments.

UNIT-3

Stains used in microbiology: Introduction to stains; importance of stain in microbiology; types of stains in detailed giving example-simple stain differential stain, negative stain, impregnation method; special staining for certain bacteria, bacterial spores, parasites and fungi; principle, procedure, application and result, interpretation of gram staining and ziehl neelsen staining.

Reference book: [Burton’s microbiology for the health science, the science of laboratory diagnosis, C.P Baveja, P.B godkar "A Textbook of Basic and Applied Microbiology" by K R Aneja]

BVCCT-206-BASIC OF HEALTH MARKET AND ECONOMY

Unit I

Health Care Market An Introduction : Main Problems in the Market for Health Care, Health Care and

Economic Basics, Analyzing Health Care Markets. Demand-Side Considerations: Demand for Health

and Health Care, Market for Health Insurance

Unit II

Supply-Side Considerations: Managed Care, Health Care Professionals, Hospital Services,

Confounding Factors Public Policy in Medical Care: Policies to Enhance Access, Policies to Contain

Costs, Medical Care Systems Worldwide,

UNIT-III

Health Sector in India: An Overview Health Outcomes; Health Systems; Health Financing

Evaluation of Health Programs Costing, Cost Effectiveness and Cost-Benefit Analysis; Burden of

Diseases ,Role of WHO , Health Care Budget: purpose, types & practices in Indian context.

UNIT-IV

Health Economics: Fundamentals of Economics: Scope & coverage of Health Economics, demand for

Health Sciences; Health as an investment, population, Health &Economic Development.

Tools of Economics-Concepts of need, demand, supply & price in Health Services.

Methods & Techniques of Economic Evaluation of Health Programmes: Cost benefit

&cost effective methods-output & input analysis.

Market, monopoly, perfect & imperfect competition. Health Financing from various sources – Public ,

Private, TPA.

Economics of Health Programmes for Nutrition, diet &population control, economics of abuse of

tobacco & alcohol, environmental influences on health and feeding.

Economics of Communicable (STDs & Malaria) & non-communicable (IHD & Cancers) diseases.

PRACTICALS:

BVCCTP-201- Practical Applied Anatomy And Physiology Related To Cardiac Technology

Demostartion of:

- Heart Surface anatomy of heart, chambers of the heart, valves of the heart, major blood
- vessels of heart, pericardium, coronary arteries.
- Histology: Types of tissue
- (a) Epithelia – Squamous, Glandular, Transitional, Cartilage
- (b) Connective tissue – bone, fibrous tissue, muscle
- Cardiac cycle: Mechanical events, Arterial cycle and central venous pressure cycle, Clinical
- aspects of human cardiac cycle
- heart rate
- Pulse Doppler methods Hemodynamics
- Preload, after-load and contractility, Control of stroke volume and cardiac output
- Vascular smooth muscle automaticity
- reflex
- transfusion, Hemostasis

BVCCTP-202- Practical Applied biochemistry in cardiac care

Demostration of:

- Biomolecules and the cell: Major complex biomolecules of cell and cell organelles-Prokaryotic and eukaryotic cell
- Carbohydrates
- Disaccharides, Polysaccharides, Homopolysaccharides, Heteropolysaccharides,Glycoproteins
- Proteins
- Managment of biochemistry lab
- safety in lab

BVCCTP-203-Pharmacology related to cardiac technology

Demostration of:

- drug used in cardiovascular system
- adverse drugs reaction

BVCCTP-204- Practical Medical electronics, biophysics and computer usage relevant to cardiac technology

Demostration of:

- Blood pressure recording
- Pressure transducers
- Defibrillators
- Cathode ray tubes and physiological monitors
- Impedence plethysmography
- Pulse oximetry
- Medical ultrasound and Doppler
- Ionic currents and Electrocardiography
- Electrocardiographic processing and display system

BVCCTP-205-General Microbiology

- Use of microscope in examination of unstained bacteria, fungi, algae, parasites and stained cell preparations including simple staining, Gram's staining, acid fast staining, capsule staining, spore staining using
- prokaryotic and eukaryotic cells, hanging drop preparation.
- Preparation of culture media, spread plates, pour plates,
- selective media, differential media.
- Separation of pure cultures and study the effect of selective nutrients on prokaryotes
- Isolation of Soil Bacteria, Soil Fungi, Soil Actinomycets
- Selective media for Soil microflora and use of growth factors, Study of Rhizosphere interactions, Quantitative measurements of Soil nutrients and Rhizosphere microflora and preparation of starter cultures of Rhizobia, Azotobacter.

III Semester

BVCCT-301-Pathology related to cardiac care

UNIT-1

Valvular heart disease: Etiology, Acquired valvular heart disease, Rheumatic fever and rheumatic heart disease, Aortic stenosis, Aortic regurgitation, Mitral valve disease, Mitral stenosis, Mitral regulation, Tricuspid valve disease, Infective endocarditis, Valvuloplasty and valve surgery

Coronary artery disease: Pathophysiology and clinical recognition, Angina Pectoris, Symptomatic and asymptomatic myocardial ischemia, Types and locations of myocardial infarction, Thrombolytic therapy, Medical treatment, Percutaneous interventions, Surgicaltreatment, Cardiac rehabilitation

UNIT-2

Systemic hypertension: Essential and seconodary hypertension

Heart failure: Surgical and medical treatment

Myocardial diseases: Dilated cardiomyopathy, Hypertrophic cardiomyopathy, Myocarditis, Restrictive cardiomyopathy.

Pericardial Diseases: Pericardial effusion, Constrictive pericarditis, Cardiac tamponade

UNIT-3

Electrical disturbances of the heart: Sinus node dysfunction, Arrhythmias and conduction disturbances, Treatment of arrhythmias, pharmacological, radiofrequency ablation and surgery

Pulmonary hypertension: Primary pulmonary hypertension, Pulmonary thrombo-embolism

Peripheral Vascular Disease: Atherosclerotic peripheral vascular disease, Aortic aneurysms, Aortic dissection, Takayasu arteritis

UNIT-4

ConGeneralital heart disease: (a) Acyanotic heart disease, Atrial septal defect, Ventricularseptal defect, Patent ductus arteriosus, ConGeneralital valvular disease, Coarctation of aorta

(b) Cyanotic Congenital heart disease, Tetralogy of Fallot , Double outlet right ventricle

Pulmonary atresia, Transposition of great arteries, Truncus arteriousus, Total anomalous pulmonary venous connection.

BVCCT-302-Microbiology related to cardiac care

UNIT-1

Microbiology

1. Introduction to Microbiology & classification.

UNIT-2

Morphology & Physiology of Bacteria

Staphylococcus

Streptococcus Mycobacterium tuberculosis Spirochetes

CornybacteriumDiptheria.

UNIT-3

Gram Positive Bacteria

Gram Negative Bacteria

Fungi -sephorophytics and pathoGeneralic

Virus

Aseptic techniques

Chlamyadia& parasites.

BVCCT-303-Advanced electrocardiography

UNIT-1

The abnormal electrocardiogram, Left atrial abnormality, Right atrial abnormality, Left ventricular hypertrophy and enlargement, Right ventricular hypertrophy and enlargement,

Intraventricular conduction delays, Left anterior fascicular block, Left posterior fascicular block,

Left bundle branch block, Right bundle branch block, Myocardial ischemia and infarction,

UNIT-2

Repolarization (ST-Twave) abnormalities, QRS changes,

Evolution of electrocardiographic changes, Localization of ischemia or infarction, Non-

infarction Q waves, Primary and seconday T wave change,

Electrolyte and metabolic ECG abnormalities, Cardiac arrhythmias, Ventricular premature

UNIT-3

beats, Supra-ventricular, tachycardias, Atrial flutter/fibrillation, Ventricular

Tachycardia/Ventricular fibrillation, Atrio Ventricular block, Prolonged PR interval, Mobitz

UNIT-4

type 1 and 2 block, Complete heart block, Direct Current (DC) shock, Defibrillator, Monophasic

and biphasic shock, Technique of cardioversion, Indications for cardioversion.

BVCCT -304-Echocardiography

UNIT-1

M- Mode and 2D transthoracic echocardiography, Views used in transthoracic

echocardiography,

Doppler echocardiography: pulsed, continuous wave and colour,

Measurement of cardiac dimensions, Evaluation of systolic and diastolic left ventricular

UNIT-2

function, Regional wall motion abnormalities, Stroke volume and cardiac output assessment,

Transvalvular gradients, Orifice area, Continuity equation,

Echocardiography in Valvular heart disease: Mitral stenosis, Mitral regurgitation, Mitral valve

UNIT-3

prolapsed, Aortic stenosis, Aortic regurgitation, Infective endocarditis Prosthetic valve

assessment,

Echocardiography in Cardiomyopathies: Dilated, Hypertrophic, Restrictive, Constrictive

UNIT-4

pericarditis, pericardial effusion and cardiac tamponade, Echocardiographic detection of conGeneralital heart disease: Atrial septal defect, Ventricular

septal defect, Patent ductus arteriosus, Pulmonary stenosis, Tetralogy of Fallot, Coarctation of

aorta, left atrial thrombus, Left aortal myxoma, Transoesophageal echocardiography

BVCCT-305-ADVANCE COMPUTING SKILL

Unit-1

Advance Word Processing Tools

Setting the layout of Table and documents, Mail merge techniques. Letter envelopes etc,

Using spell check and Thesaurus, Foot note nad Endnotes, Using Charts , shapes and pictures in

word .

Unit-2

Basics of Spreadsheet

Functions of Spreadsheet , Applications , Elements of Electronic Spread sheet ,creating

document saving and printing the worksheet, manipulation of cells ,Functions and charts, using

formulas , Functions and charts

UNIT-3

Advance Spreadsheet Tools

Manipulations with charts and its types, Sorting, Filtering of data ,Pivot table, data validation techniques. Grouping and subtotaling of data. Text to column option . Printing of customized worksheet.

UNIT-4

Presentation Software

Using Powerpoint, Opening an powerpoint presentation, Saving a presentation , Entering and editing text, inserting and deleting slides in a presentations , preparation of slides , adding clip arts, charts etc., Providing Aesthetics , Enhancing text presentation ,working with color lines styles and movie and sound ,adding header and footer, presentation.

BVCCT-306-HUMAN VALUE AND PROFESSIONAL ETHICS

UNIT-1

Need, Basic Guidelines, Content and Process for

Value Education

Understanding the need, basic guidelines, content and process for Value Education

Self-Exploration 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 fulfilment of

aspirations of every human being with their correct priority

Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

Method to fulfil the above human aspirations: understanding and living in harmony at various levels

UNIT 2:

Understanding Harmony in the Human BeingUnderstanding human being

Understanding the Body as an instrument

Understanding the harmony of Body, correct appraisal of Physical needs, meaning of Prosperity in detail

UNIT 3:

Understanding Harmony in the Family and Society-

Harmony in Human Relationship

Understanding Harmony in the family – the basic unit of human interaction

Understanding values in human-human relationship

Trust and Respect as the foundational values of relationship

Understanding the meaning of trust

Difference between intention and competence. Understanding the meaning of respect

Understanding the harmony in the society (society being an extension of family)

UNIT-4

Natural acceptance of human values

Definitiveness of Ethical Human Conduct

Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Competence in professional ethics:

a) Ability to utilize the professional competence for augmenting universal human order

b) Ability to identify the scope and characteristics of people-friendly and eco-friendly

production systems,

c) 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:

a) 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

PRACTICALS:

BVCCTP-301- Pathology related to cardiac care

- Valvular heart disease,rheumatic heart disease stenosis,
- Mitral regulation,
- Tricuspid Medical treatment,
- Percutaneous interventions,
- Surgical treatment,
- Cardiac rehabilitationpulmonary venous connection.

BVCCTP-302- Practical Microbiology related to cardiac care

demostration of:

- Staphylococcus
- Streptococcus Mycobacterium tuberculosis Spirochetes
- CornybacteriumDiptheria.
- Gram Positive Bacteria staning
- Gram Negative Bacteria staning

BVCCTP-303- Practical Advanced electrocardiography

- Abnormal electrocardiogram
- Localization of ischemia or infarction,
- Technique of cardioversion, Indications for cardioversion.

BVCCTP -304-Echocardiography

UNIT-1

Demostration of:

- Echocardiography,
- Doppler echocardiography
- Echocardiography in Valvular heart

BVCCTP- 305-Practical Advance Computing skills

- Word Processing
- Mail merge techniques
- Using Charts , shapes and pictures in word .
- Basics of Spreadsheet
- document saving and printing the worksheet
- formulas , Functions and charts
- Advance Spreadsheet Tools
- worksheet.
- Presentation Software
- Using Powerpoint working with color lines

styles and movie and sound ,presentations

IV Semester

BVCCT-401-Treadmill exercise stress testing and 24 hr. ECG reporting

UNIT-1

Exercise physiology, protocols, Lead systems, Patient preparation

ST segment displacement – types and measurement, Non electrocardiographic observations

UNIT-2

Exercise test indications, contra-indications and precautions

Cardiac arrhythmias and conduction disturbances during stress testing, EmerGeneralcies in the

UNIT-3

stress testing laboratory. Principles of Holter Recording, Connections of the Holter recorder, Holter Analysis

Guidelines for ambulatory electrocardiography

BVCCT- 402-Community healthcare

UNIT-1

Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept. a. National Health Policy b. National Health Programmers (Briefly Objectives and Scope) c. Population of India and Family welfare programme in India.

UNIT-2

Family: a. The family, meaning and definitions b. Functions of types of family c. Changing family patterns d. Influence of family on Individuals Health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their Importance to physiotherapy.

UNIT-3

Community: a. Rural community: Meaning and features – Health hazards to rural communities, health hazards to tribal community. b. Urban community – Meaning and features – Health hazards of urbanities

UNIT-4

Culture and Health Disorders a. Social Change: b. Meaning of social changes c. Factors of social changes d. Human adaptation and social changes e. Social changes and stress f. Social changes and deviance g. Social changes and health programme h. The role of social planning in the Improvement of health and rehabilitation 5. Social Problems of disabled: a.

Consequences of the following social problems in relation to sickness and disability b. Population explosion

BVCCT-403-General medicine and surgery

UNIT-1

MEDICINE

Pericarditis

Valvular diseases

Rheumatic Heart Disease

Heart failure

Chronic Bronchitis

UNIT-2

Emphysema

Brochitis

Pneumonia

Tuberculosis

Pleura effusion

Empyema

Spontaneous Phenumo thorax

UNIT-3

Surgery

Cholelithiasis

Peritonitis

Suprahrenic Abscess

UNIT-4

Appendicitis

Benign Hypertrophy prostate

Sinusitis

BVCCT- 404-Medical terminology and record keeping

UNIT-1

Derivation of medical terms.

Define word roots, prefixes, and suffixes.

Conventions for combined morphemes and the formation of plurals.

Basic medical terms.

UNIT-2

Form medical terms utilizing roots, suffixes, prefixes, and combining roots.

Interpret basic medical abbreviations/symbols.

UNIT-3

Utilize diagnostic, surgical, and procedural terms and abbreviations related to the

integumentary system, musculoskeletal system, respiratory system, cardiovascular system,

UNIT-4

nervous system, and endocrine system.

Interpret medical orders/reports.

Data entry and management on electronic health record system.

BVCCT-405-HEALTH AND FITNESS

Unit 1:

Personal Health, Nutrition, and Fitness

Your Lifestyle and Your Health

Your Role in Maintaining Your Health

Guidelines for a Healthy Diet

Dietary Guidelines and Nutritional Facts

Nutrition and Chronic Diseases

Individual Caloric and Nutritional Needs

Benefits of Physical Activity

Unit 2

Preventing Disease and Injury

Immunity and Preventing Disease

Lifesaving and EmerGeneralcy Care Procedures

Strategies for Preventing Accidents

Unit 3

Growth, Development, and Sexuality

Human Reproduction and Development

Benefits of Healthy Sexual Practices

Peer Pressure and Sexual Activity

Family Planning Strategies

Unit 4

Substance Abuse

Health Effects of Using Alcohol, Tobacco, and Other Drugs

Harmful Effects of Dietary Supplements and Anabolic Steroids

Effects of Medicines and Illegal Substances

Peer Pressure Substance Abuse

BVCCT-406-Advance communication and soft skill

UNIT-1

Functional Grammar-II

a) Application writing

b) Paragraph writing, essay writing and précis writing

c) Pre-testing of oral and writing skills

UNIT-2

Professional Skills

a) Biodata, CV and resume writing

b) Joining letter, cover letter and resignation letter

c) Inter- office memo, formal Business letter, informal notes

d) Minutes of the meeting, reporting events, summary writing

UNIT-3

Presentation skills

a) Power-point presentations and presenting techniques

b) Body language

c) Describing people, places and events

d) Extempore, speech and just- a minute sessions

UNIT-4

Interview skills

a) Developing skills to- debate, discussion, basics of GD and styles of GD

b) Discussion in groups and group discussion on current issues

c) Steps to prepare for an interview and mock interviews

Public speaking

a) Art of public speaking

b) Welcome speech

c) Farewell speech

d) Votes of thanks

Oral practice

a) Debate

b) Just-a-minute

c) Group discussion

d) Mock interviews

PRACTICALS:

BVCCTP-401- Practical Treadmill exercise stress testing and 24 hr. ECG reporting

- Exercise , Patient preparation
- types and measurement
- stress testing laboratory.

BVCCTP- 402- Practical Community healthcare

- visit to different ngos
- National Health Policy
- National Health Programmers (Briefly Objectives and Scope)
- Population of India and Family welfare programme in India.

BVCCTP-403-Generalmedicine and surgery

- demostration of heart disease with indication and containdication by ppt and presentations

BVCCTP- 404-Medical terminology and record keeping

demostration of:

- medical terms.
- Interpret basic medical abbreviations/symbols.
- Utilize diagnostic, surgical, and procedural terms and abbreviations related to the

BVCCTP-405-PRACTICAL-Health and fitness

DEMOSTRATION OF:

Personal Health

Dietary Guidelines

Substance Abuse

Health Effects of Using Alcohol, Tobacco, and Other Drugs

Effects of Medicines and Illegal Substances

V Semester

BVCCT-501-CARDIAC ACTHETERIZATION LABORATORY BASICS

UNIT-1

Type of catheters

Catheter cleaning and packing

Techniques of sterilization-advantages and disadvantages of each

Setting up the cardiac catheterization laboratory for a diagnostic study

Table movement

Image intensifier movement

Image play back

UNIT-2

Intra cardiac pressures

Pressure recording systems

Fluid filled catheters versus catheter tipped

manometers Artifacts, damping, ventricularization

Pressure gradient recording – pullback, peak – to peak

Cardiac output determination

UNIT-3

Thermo dilution method

OxyGeneral dilution method

Principles of oximetry

Shunt detection and calculations.

Coronary angiography

UNIT-4

Coronary angiographic catheters

Use of the manifold

Angiographic views in coronary angiography

Laboratory preparation for coronary angiography

Left Ventriculography – catheters, views, use of the injector

BVCCT-502-QUALITY CONTROL AND PATIENT SAFETY

UNIT-1

Concepts of Quality of Care

Quality Improvement Approaches

Standards and Norms

Quality Improvement Tools

UNIT-2

Vital signs and primary assessment

Basic emerGeneralcy care – first aid and triageVentilations including use of bag-valve-masks (BVMs)

d. Choking, rescue breathing methods

UNIT-3

One- and Two-rescuer CPR

Using an AED (Automated external defibrillator).

Managing an Emer Generalcy including moving a patient

BVCCT-503-BIOSTATICS

UNIT-1

Introduction about Biostatistics, variables, data, population sample, parameter statistics, scales of measurement.

Classification & Presentation of data: Frequency distribution, Frequency polygon, Bar diagram, Histogram, Frequency distribution curve, CF & CP, Ogive, Percentile & Quartiles.

Descriptive statistics: Statistics of location, Mean Median Mode, Geometric mean, Range, Statistics of Dispersion, Mean Deviation, Standard Deviation, Coefficient of Variation. Correlation & Regression.

UNIT-2

Sampling Statistics: Sampling & Sampling Distribution, Sampling Errors & sampling statistics, Standard errors, Degree of freedom, Types of Sampling.

Probability Distribution: Classical definition, Conditional probability, Probability in continuous, joint distribution of random variables.

UNIT-3

Experimental Design: Controlled and uncontrolled experiment, Sampling types, Sample size & pilot experiment, Single factor experiment & Factorial experiment-example, Analysis of variance (ANOVA).

UNIT-4

Applications: Collection, presentation and analysis of hospital statistical data with examples. Collection, presentation and analysis of Optometric and ophthalmologic data with a few examples

BVCCT-504 Medical Ethics and Patients Care

UNIT 1

Medical ethics - Definition - Goal - Scope

Introduction to Code of conduct

UNIT 2

Basic principles of medical ethics –Confidentiality

Malpractice and negliGeneralce - Rational and irrational drug therapy

UNIT 3

Autonomy and informed consent - Right of patients

Care of the terminally ill- Euthanasia

UNIT 4

Organ transplantation, Medico legal aspects of medical records –Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects, Professional Indemnity insurance policy, Development of standardized protocol to avoid near miss or sentinel events, Obtaining an informed consent

BVCCT-505-Digital literacy & Account Literacy

Unit 1:

Review of MS office

Advance options in MS excel

Excel

Power point

Introduction to internet learning platform

Using internet-based learning platform

Using google and you tube for learning

Using smart phone to become smart

UNIT-2

Benefits of digital learning

Using internet for personal requirement

Online payments method

Use of social media for advisement

Digital security and privacy

Various cybercrime and their safety guideline

Best practice for securing online and network transaction

Managing privacy and security and social media accounts

UNIT-3

Introduction and basic of financial planning

Concept of time and value of money

Risk and return

Myths about easy money

Financial planning with examples

Introduction to financial market and institution investment option in post office

Sources of finance

Capital market basics

Basic of money market

Mutual funds

UNIT-4

Life insurance

General insurance

Types of banks

KYC

Function of commercial banks and RBI and its function

Deposit accounts-understanding of operation

Retail finance

Personal loan

Corporate banking

Cheque collecting services

Payments modes in banking system

BVCCT-506-Introduction to National Healthcare System

UNIT-1

1. Introduction to healthcare delivery system

a. Healthcare delivery system in India at primary, secondary and tertiary care

b. Community participation in healthcare delivery system

c. Health system in developed countries.

d. Private Sector

e. National Health Mission

f. National Health Policy

g. Issues in Health Care Delivery System in India

UNIT-2

2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Heath Programme.

UNIT-3

3. Introduction to AYUSH system of medicine

a. Introduction to Ayurveda.

b. Yoga and Naturopathy

c. Unani

d. Siddha

e. Homeopathy

f. Need for integration of various system of medicine

UNIT-4

4. Health scenario of India- past, present and future

Demography & Vital Statistics-

a. Demography – its concept

b. Vital events of life & its impact on demography

c. Significance and recording of vital statistics

d. Census & its impact on health policy

6. Epidemiology

a. Principles of Epidemiology

b. Natural History of disease

c. Methods of Epidemiological studies

d. Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing aGeneralts, cold chain, immunization, disease monitoring and surveillance.

BVCCTP-501- Practical CARDIAC ACTHETERIZATION LABORATORY BASICS

UNIT-1

DEMOSTRATION OF:

- Use of catheters
- Catheter cleaning and packing
- Techniques of sterilization
- Table movement
- Image intensifier movement
- Shunt detection and calculations.
- Use of the manifold

BVCCTP-502-QUALITY CONTROL AND PATIENT SAFETY

- Quality of Care
- Vital signs and primary assessment
- Basic emerGeneralcy care

BVCCTP-503-BIOSTATICS

- Calculation of data, population sample, parameter statistics, scales of measurement.
- Classification & Presentation of data.

BVCCTP-504-Practical digital literacy and account literacy

- Uses Advance options in MS excel
- Excel
- Power point
- Using internet-based learning platform
- Using google and you tube for learning
- Using smart phone to become smart
- Using internet for personal requirement
- Online payments method
- Use of social media for advisement

BVCCTP- 506- Practical Medical Ethics and Patient Care

- law and liability and duties of staff
- Workplace issues
- Bioethical issue
- Care and handling of patient
- Medico legal cases
- emergency care and life support skills
- CPR
- Vital signs and primary assessment
- bag-valve-masks

VI Semester

601-BVCCT -CARDIAC ACTHETERIZATION LABORATORY ADVANCE

UNIT-1

Aortic angiography – aortic root, arch, abdominal aorta Peripheral angiography and carbondioxide angiography Catheterization and angiography in children with conGeneralital heart disease Contrast aGeneralts

Ionic and non-ionic

Types of non-ionic aGeneralts

Contrast nephropathy

Measures to reduce incidence of contrast neophropathy

Coronary angioplasty (PTCA)

Equipment and harware used in PTCA:

Guiding catheters

UNIT-2

Guidewires

Balloons

Stents

Setting up the laboratory for a PTCA case

Management of complications:

Slow flow/no flow

Acute stent thrombosis

Dissection

Perforation

Pediatric Interventions

Aortic and pulmonary valvuloplasty

Coarcation angioplasty and stenting

Device closure of PDA, ASD,VSD

Technique and decices used

Sizing of devices

Coil.closure of PDAs

UNIT-3

Balloon Mitral valvuloplasty (BMV)

Techniques and hardware used in BMVSetting up the laboratory for a BMV case

Technique and equipment used for transseptal puncture

Recording of transmitral pressure gradients

Management of cardiac tamponade

Peripheral intercentions

Equipment and techniques used

Endovascular exclusion of aneurysms

Self-expanding stents, covered stents and cutting ballons

Intra-aortic balloon pump (IABP)

Theory of intra-aortic balloon couonterpulsation

Indications for IABP use

Setting up the IABP system

UNIT-4

Thromboembolic disease

Indications and use of venacaval filters

Techniques of thrombolysis – drug and catheters used

Thrombus aspirations systems – coronary, peripheral

Thrombus aspirations systems – coronary, peripheral

Cardiac pacing

Temporary pacing – indications, technique

Permanent pacing

Indications

Types of pacemakers and leads

Setting up the laboratory for permanent pacing

Pacemaker parameter checking

Follow-up of pacemaker patients

Cardiac electrophysiology

Catheters used in electrophysiology studies

Connection of catheters during an EP study

Equipment used in arrhythmia induction

PRACTICALS:

601-BVCCTP - PRACTICAL CARDIAC ACTHETERIZATION LABORATORY ADVANCE

Demostration of:

- Aortic angiography
- carbondioxide angiography Catheterization and angiography in children with conGeneralital
- use of Contrast aGeneralts
- Measures to reduce incidence of contrast neophropathy
- Coronary angioplasty (PTCA)
- Equipment and harware used in PTCA

use of:

- Guidewires
- Balloons
- Stents
- Setting up the laboratory for a PTCA case
- Balloon Mitral valvuloplasty (BMV)