

# OPJS UNIVERSITY, CHURU (RAJASTHAN)



## **SYLLABUS**

For  
**B.Sc. in Cardiac Care Technology**  
**(BSCCT)**

(Academic Program)

**School of Para-Medical Science**  
**OPJS UNIVERSITY, CHURU**  
**(RAJASTHAN) 2016-17**



**YEAR I (500 Marks)**

Course Code	Course Title	Distribution of Marks	
		Theory/ Practical	Continuous Assessment
BSCC-101	Human Anatomy	70	30
BSCC-102	Physiology	70	30
BSCC-103	Biochemistry	70	30
BSCC-104	Pathology-(Clinical Pathology, Hematology& Blood Banking)	70	30
BSCC-105	Microbiology	70	30
<b>TOTAL</b>		<b>350</b>	<b>150</b>

**YEAR II (400 Marks)**

Course Code	Course Title	Distribution of Marks	
		Theory/ Practical	Continuous Assessment
BSCC-201	Medicine Relevant to Cardiac Care Technology	70	30
BSCC-202	Applied Pathology Microbiology	70	30
BSCC-203	Applied Pharmacology	70	30
BSCC-204	Introduction to Cardiac Care Technology	70	30
<b>TOTAL</b>		<b>280</b>	<b>120</b>

**YEAR III (300 Marks)**

Course Code	Course Title	Theory/ Practical	Continuous Assessment
BSCC-301	Cardiac Care Technology-Clinical	70	30
BSCC-302	Cardiac Care Technology-Applied	70	30
BSCC-303	Cardiac Care Technology-Advanced	70	30
<b>TOTAL</b>		<b>210</b>	<b>90</b>

DETAILED SYLLABUS  
**BSCC101-HUMAN ANATOMY**

Unit-I: Introduction

Definition of Anatomy and Physiology, land marks of the body, common anatomical terminologies, anatomical positions & anatomical Planes, definition of Cell & Tissues, Various types of cells and tissues.

Unit II: Skeletal System

Introduction to bone & joints, different bones & joints of the body, various types of movements at the bony joints

Unit-III: Blood & Lymphatic System

Blood as a connective tissue, composition of blood, Lymph & Lymphatic System- brief overview, clinical terminologies

Unit-IV: Cardiovascular System

Anatomical Structure of Heart, Cardiac output, stroke Volume, Heart sounds, brief description of blood supply in upper & lower limb, circle of Willis or blood supply in Brain, Clinical notes

Unit-V: Digestive System

Introduction to digestion, brief anatomical description of various parts of the digestive system & their functions, nine regions of the abdominal cavity,

Unit-VI: Excretory System

Definition of excretion & excretory system, gross anatomy of Kidney, Ureters & Urinary Bladder. Clinical terminologies.

Unit-VI: Respiratory System

Introduction & definition of respiration, inspiration & expiration, various parts of the respiratory system, clinical terminologies.

Unit-VII: Reproductive System

Introduction & definition of reproduction, brief anatomical description of the male and female reproductive system, related clinical notes

Unit- VIII: Endocrine System

Definition & classification of glands, brief anatomical description of various endocrine glands

Unit-IX: Nervous System

Introduction to nervous system, various parts of brain & their functions, Meninges as protective coverings of brain, different regions of brain, ventricles of brain, hypothalamus as specialized centre of brain, cranial & spinal nerves

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Unit X: The Sensory System

Brief overview of structure & functions of eye, ear, nose, tongue

PRACTICAL

1. Osteology: Bones identification (right and left side) and prominent features and muscle attachment of the bone, clavicle, scapula, radius, ulna, humerus, femur, hip bone, sacrum, tibia, and fibula.
2. Histology: Slides for identification and general features

## **BSCC-102- PHYSIOLOGY**

### Unit-I: Introduction

Definition of Physiology, functions of cells, cell organelles and tissues.

### Unit II: Skeletal System

Functions of Skeletal System

### Unit-III: Blood & Lymphatic System

Functions of Blood and Lymphatic System, related clinical terminologies

### Unit-IV: Cardiovascular System

Systemic or body circulation, Pulmonary or lesser circulation, Cardiac cycle, Cardiac output, stroke Volume, Heart sounds, circle of Willis or blood supply in brain, clinical notes

### Unit-V: Digestive System

An overview of the mechanism of digestion, digestive Juices, outlines of the Hepato-biliary system.

### Unit-VI: Excretory System

Functions of Kidney, Ureters & Urinary Bladder, hormones secreted from kidney and their role in the body, formation of Urine, composition of urine, clinical terminologies.

### Unit-VI: Respiratory System

Mechanism of gaseous exchange, clinical terminologies.

### Unit-VII: Reproductive System

Functions of the male and female reproductive system, hormones secreted from the male and female gonads and overview of their functions.

### Unit- VIII: Endocrine System

Hormones of Pituitary gland, thyroid gland, parathyroid gland and adrenal gland with special emphasis on pituitary gland

### Unit-IX: Nervous System

Functions of Mid brain, Hind Brain and Forebrain, Composition of CSf and its function.

Protective functions of meninges

Unit X: The Sensory System

Brief overview of functions of eye, ear, nose, tongue

### **BSCC-103- BIOCHEMISTRY**

**Unit1. Bio-molecules and the cell:** Major complex bio-molecules of cell and cell organelles- Prokaryotic and eukaryotic cell

**Unit2.Carbohydrates:** Chemical structure, function and Classification: Monosaccharide, Disaccharides, Polysaccharides, Homo polysaccharides, Hetero polysaccharides, Glycoproteins

**Unit3.Proteins:** Amino acids, Classification, Structure of proteins, Determination of protein structure, Properties of proteins, Denaturation, Classification of proteins, Antigen Antibody Types, Plasma proteins, Blood clotting.

**Unit4.Lipids:** Chemical structure, functions and Classification, fatty acids, Triacylglycerols, Phospholipids, glycoproteins, Lipoproteins, Steroids, Amphipathic lipids.

**Unit5.Nucleic acids:** Purines and pyrimidine, Structure of DNA, Watson & Crick model of DNA, Structure of RNA, types of RNA

**Unit6.Enzymes:** Definition, Nomenclature, Classification, Factors affecting enzyme activity, Active site, Coenzyme, Enzyme Inhibition, Mechanism of enzyme action, Units of enzyme, Isoenzymes, Enzyme pattern in diseases.

**Unit7.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), respiratory quotient(RQ), Specific dynamic action(SDA), Balanced diet, Marasmus, Kwashiorkor

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**Unit8.Hormones:** Classification, Mechanism of action, hypothalamic hormones, Pituitary– Anterior, posterior; Thyroid – Adrenal cortex, Adrenal medulla; Gonadal hormones, menstrual cycle, GI hormones

**Unit9.Acids and bases:** Definition, pH, Henderson Hasselbach equation, Buffers, Indicators, Normality, Molarity, Molality

## **PRACTICAL**

### **I. Qualitative tests of monosaccharide (glucose and fructose)**

- a. Molisch's test
- b. Fehling's test
- c. Benedict's test
- d. Seliwanoff's test

### **II. Qualitative tests of lipids**

- a. Solubility tests
- b. Emulsification tests
- c. Saponification tests

### **III. Qualitative tests of proteins**

- a. Isoelectric precipitation tests
- b. Heat coagulation tests

## **BSCC-104- Pathology (Clinical Pathology, Hematology & Blood Banking)**

### **Unit1. Cardiovascular System:**

Definition, causes, brief pathogenesis and morphology, types (if any), risk factors, clinical significance, effects and preventive measures of the following cardio vascular diseases

- Atherosclerosis
- Hypertension
- Aneurysms
- Cardiac hypertrophy
- Ischemic heart diseases
- Valvular Heart diseases
- Cardiomyopathy
- Pericardial effusion
- Congenital heart diseases
- Pathophysiology of heart failure

### **Unit2. Hematology:**

Definition, causes, brief pathogenesis, types (if any), risk factors, clinical significance, diagnosis and preventive measures of the following hematological disorders:

- Anaemia
- Hypervolemia
- Leukemia, leukocytosis and agranulocytosis
- Bleeding disorders

### **Unit3. Respiratory System:**

Definition, causes, brief pathogenesis, types (if any), risk factors, clinical significance, diagnosis and preventive measures of the following hematological disorders

- Chronic Obstructive Pulmonary Diseases (COPD)
- Dispnoea
- Bronchitis and bronchiectasis
- Pulmonary Edema
- Bronchospasm and respiratory arrest
- Brief concept about pulmonary obstructive versus pulmonary restrictive diseases

### **Unit4. Renal System:**

Clinical significance of renal diseases briefly causes, mechanism, effects and laboratory diagnosis



- Hydronephrosis
- Obstructive Uropathies
- Renal failure
- VUR
- ARF & CRS
- Brief overview of role of dialysis and renal transplantation in management of end stage renal diseases

### **Unit5. Clinical Pathology**

- Introduction to clinical pathology, collection, transport, preservation and processing of various clinical specimens,
- Urine Examination- collection and preservation of urine, physical, chemical, microscopic examination
- Examination of body fluids-examination of cerebrospinal fluid (CSF)
- Sputum Examination
- Examination of faeces

## **BSCC-105- MICROBIOLOGY**

### **Unit1. General & Clinical Morphology**

● Introduction and definition, branches of microbiology, introduction and definition of microbes, virus, bacteria and microorganisms, size, shape and structure of bacteria and virus, use of microscope in the study of bacteria

### **Unit2. Growth and Nutrition:**

● Nutrition, growth and multiplication of bacteria, common bacterial diseases, use of culture media in diagnostic bacteriology.

### **Unit3. Sterilization and Disinfection:**

● Introduction and importance, principles and use of equipments of sterilization namely hot air oven, autoclave and serum inspissator  
● Pasteurization, antiseptic and disinfectants  
● Antimicrobial sensitivity test.

### **Unit4. Immunology:**

● Immunity- vaccines, types of vaccine and immunization schedule  
● Principles and interpretation of commonly done serological tests like Widal, VDRL, ASLO, CRP, RF & ELISA  
● Rapid tests for HIV and HbSAg

### **Unit5. Systematic Bacteriology:**

● Morphology, cultivation, diseases caused by bacteria, laboratory diagnosis including specimen collection of Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C. diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, E. coli, Klebsiella, Proteus, Vibrio cholerae, Pseudomonas & Spirochaetes.

### **Unit6. Parasitology:**

● Morphology, life cycle, laboratory diagnosis of E. histolytica, Plasmodium Vivax, Bucheria bancrofti, tape worms and intestinal nematodes.

### **Unit7. Mycology:**

● Morphology, diseases caused and lab diagnosis of fungi like candida, cryptococcus, dermatophytes etc., opportunistic fungi

**Unit8. Virology:**

● General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses: Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

**Unit9. Nosocomial Infection:**

● Causative agents, transmission methods, investigation, prevention and control of Nosocomial/Hospital infection, principles and practice, biomedical waste management.

**SECOND YEAR****BSCC-201- MEDICINES RELEVANT TO CARDIAC CAE TECHNOLOGY**

**Unit1. Anti-anginal agents: Beta blockers-** propranolol, atenolol, metoprolol, bisoprolol carvedilol, esmolol; **Nitrates**-nitroglycerine, isosorbide dinitrate, isosorbide mononitrate, transdermal nitrate patches; **Calcium channel blockers-** nifedipine, verapamil, diltiazem, amlodipine

**Unit2. Anti-failure agents: Diuretics-**furosemide, torsemide, thiazide diuretics, metolazone, spironolactone, combination diuretics; **Angiotensin converting enzyme (ACE) inhibitors-** captopril Enalapril, ramipril, lisinopril, ACE inhibitors for diabetics and hypertensive renal disease; **Digitalis and acute ionotropes** – digoxin, dobutamine, dopamine, adrenaline, noradrenaline, isoprenaline

**Unit3. Anti-hypertensive drugs:** Diuretics, beta-blockers, ACE inhibitors, calcium antagonists, direct Vasodilators, centrally acting and peripherally acting vasodilators

**Unit4. Anti- arrhythmic agents:** Amiodarone, adenosine, verapamil, diltiazem, lidocaine, mexiletine, Phenytoin, flecainide, bretylium, atropine

**Unit5. Antithrombotic agents: Platelet inhibitors:** aspirin, clopidogrel; **Anticoagulants:** heparin, low molecular weight heparin, warfarin; **Fibrinolytics:** streptokinase, urokinase; **Glycoprotein 2b3a antagonists:** abciximab, tirofiban, eptifibatide

**Unit6. Lipid lowering and anti-atherosclerotic drugs:** statins, ezetimibe, niacin, fenofibrate

**Unit7. Miscellaneous drugs:Narcotics:** morphine, pethidine, fentanyl

**Unit8. Sedatives:** diazepam, midazolam

**Unit9. Steroids:** hydrocortisone, prednisolone,

**Unit10. Antihistamines:** diphenhydramine

**Unit11. Antibiotics:** penicillins, cephalosporins, aminoglycosides

**Unit12. Anesthetic agents:** local, general

**Unit13.** Antacids and proton pump inhibitors, Protamine

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### **BSCC-202- APPLIED PATHOLOGY & MICROBIOLOGY**

**Unit1. 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

**Unit2. 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, Surgical treatment, Cardiac rehabilitation

**Unit3. Systemic hypertension:** Essential and secondary hypertension

**Unit4. Heart failure:** Surgical and medical treatment

**Unit5. Myocardial diseases:** Dilated Cardiomyopathy, Hypertrophic Cardiomyopathy, Myocarditis, and Restrictive Cardiomyopathy.

**Unit6. Pericardial Diseases:** Pericardial effusion, Constrictive pericarditis, Cardiac tamponade

**Unit7. Electrical disturbances of the heart:** Sinus node dysfunction, Arrhythmias and conduction disturbances, Treatment of arrhythmias, pharmacological, radiofrequency ablation and surgery

**Unit8. Pulmonary hypertension:** Primary pulmonary hypertension, pulmonary thrombo-embolism

**Unit9. Peripheral Vascular Disease:** Atherosclerotic peripheral vascular disease, Aortic aneurysms, Aortic dissection, takayasu arteritis

**Unit10. Congenital Heart Disease(CHD):** (a) Acyanotic heart disease, Atrial septal defect, Ventricular, septal defect, Patent ductus arteriosus, Congenital valvular disease, Coarctation of aorta, Cyanotic vongenital heart disease, Tetralogy of Fallot , Double outlet right ventricle, Pulmonary atresia, Transposition of great arteries, Truncus arteriosus, Total anomalous pulmonary venous connection

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## **BSCC-203- APPLIED PHARMACOLOGY**

### **Unit1-General Concepts**

- Principles involved in drug activity
- Drug dose, route of administration, indications, contra-indications and adverse drug reactions
- Drugs acting on Autonomic Nervous System- anti-sialagogues, atropine, glycopyrolate and other drugs

### **Unit2-Cardiovascular Drugs:**

A brief overview of mode of action, side effects and therapeutic uses of the following drugs:

- Antihypertensive, Beta Adrenergic antagonists, Alpha Adrenergic antagonists, Vasodilators, Peripheral Vasodilators, Calcium channel blockers, Antiarrhythmic drugs, Cardiac glycosides
- Sympathetic and non-sympathetic inotropic agents
- Coronary vasodilators, Antianginals and drugs used in congestive heart failure
- Lipid lowering & anti-atherosclerotic drugs
- Drugs used in Haemostasis, anticoagulants, Thrombolytics and antithrombolytics
- Cardioplegic drugs - Introduction, principles and types of cardioplegia, primary solutions, drugs used in the treatment of shock.

### **Unit3-Anesthetic Agents and Common Drugs:**

- Introduction to anesthesia
- Types of anesthesia- general, local, spinal, epidural, regional, caudal and tropical anaesthesia
- General anesthesia- Dose, route and stages of GA administration, methods of GA administration, complications of GA administration and their management
- Clinical indications, dose, frequency, route of administration and counter effects of the following drugs:
  - Ketamine
  - Hydrocortisone
  - Dopamine
  - Atropine Sulphate
  - Propofol
  - Succinilecholine
  - Sodium Thiopentone Ether
  - Nitroglycerine etc

### **Unit4-Analgesics:**

- Definition and classification, routes, dose, frequency and side effects of administration of analgesics and their management

#### **Unit5- Anti-Histaminics and Antiemetic:**

- Introduction, classification, dose, route of administration, mechanism of action, adverse effects and their management

#### **Unit6-CNS Stimulants and Depressants:**

- Alcohol, Sedatives, hypnotics and narcotics, CNS stimulants
- Neuromuscular blocking agents and muscle relaxants
- Inhalational gases and emergency drugs
- Pharmacotherapy of respiratory disorders viz. bronchial asthma, cough, bronchiectasis, Bronchospasm etc.
- Mucokinetic and mucolytic agents
- Corticosteroids- Use, classification, dose, frequency, action mechanism, side effects and their management

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#### **Unit7- Chemoprophylaxis**

- Introduction, classification, action mechanism, dose, route of administration, adverse reactions and management of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol and antitubercular drugs

#### **Unit8-Diuretics and Miscellaneous Drugs:**

- Physiology of Glomerular filtration, introduction to diuretics, clinical indications, types, dose, frequency, route of administration, mechanism of action, adverse reactions and management of adverse site of action of diuretic drugs, . Adverse effects. Preparation, dose and routes of administration.

#### **Unit9. Miscellaneous:**

Fluids - Various preparations and their usage. Electrolyte supplements, plasma expanders. Immunosuppressive agents. New drugs included in perfusion technology.

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## **BSCC-204-INTRODUSCTION TO CARDIAC CARE TECHNOLOGY**

### **PART-A (ELECTROCARDIOGRAPHY)**

#### **Unit1.Orioumentation to Instrumentation in ECG**

- 1.1 Introduction
- 1.2 Parts of Manual, Semi Automated & Automated ECG Machine
- 1.3 Mode of Functioning & Advantages & Disadvantages

#### **Unit2. ECG Leads, Jelly & ECG Paper**

- 2.1 Unipolar & Bipolar Limb Leads
- 2.2 Augmentation Leads
- 2.3 Esophageal Leads
- 2.4 Color Codes in ECG Leads
- 2.5 ECG Jelly Its Role
- 2.6 ECG Paper & Properties
- 2.7 Normal Paper Speed & Standardization
- 2.8 Calibration
- 2.9 Filter

#### **Unit3. ECG Techniques**

- 3.1 Basics of ECG Technique
- 3.2 Getting the Patient Prepared for ECG
- 3.3 Application of Jelly
- 3.4 Placement of Chest & Limb Leads
- 3.5 Parameters for Recording a Good Electrocardiogram

#### **Unit4. Normal Electrocardiogram**

- 4.1 Normal P, Q & T Wave
- 4.2 P-R Interval
- 4.3 QRS Complex
- 4.4 QT Interval & ST Segment
- 4.5 Duration & Amplitude of Different Normal Waves

#### **Unit5. Exercise ECG & Tread-Mill Test**

- 5.1 Introduction
- 5.2 TMT & Exercise ECG

## **Unit6. Abnormal Electrocardiogram & Interpretation**

- 6.1 Abnormal P-Wave & A-V Node
- 6.2 LBBB & RBBB
- 6.3 LVH & RVH
- 6.4 Pulmonary Embolism & COPD
- 6.5 Myocardial Infarction & Mitral Stenosis
- 6.6 Sinus Tachycardia & Sinus Bradycardia
- 6.7 Sick Sinus Syndrome

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## **PART-B (TMT & HOLTER)**

### **Unit1. TMT**

- 1.1 Introduction
- 1.2 Working Principles
- 1.3 Tread Mill Test
- 1.4 Stress Test (ECG recording during Exercise)

### **Unit2. Equipment**

- 2.1 Treadmill
- 2.2 ECG Machine
- 2.3 Various parts of ECG Machine
- 2.4 Ambulatory BP Monitoring Machine
- 2.5 Computer

### **Unit3. Conducting TMT**

- 3.1 Preparation of Patient
- 3.2 Application of Electrodes
- 3.3 Procedure-entry of patients data
- 3.4 Choice of Protocol (Bruce, Modified Bruce)
- 3.5 Precautions while doing TMT

### **Unit4. Other Issues**

- 4.1 Normal and abnormal TMT recording
- 4.2 Complications while doing TMT

### **Unit5. Holter Techniques**

- 5.1 Introduction
- 5.2 Holter Instrumentation
- 5.3 Patient Preparation
- 5.4 Principles of Holter Recording
- 5.5 Connections of the Holter recorder
- 5.6 Holter Analysis Guidelines for ambulatory electrocardiography

## **PART-C (ECHOCARDIOGRAPHY)**

### **Unit1. Introduction**

- 1.1 Basic Principles of USG/Echocardiography



1.2 Clinical uses of echocardiography

## **Unit2. The Types**

- 2.1 Types of Echocardiography
- 2.2 Trans Thoracic Echocardiography
- 2.3 Trans esophageal Echocardiography

## **Unit3. Instrumentation in Echocardiography**

- 3.1 Equipments
- 3.2 Echo Machine
- 3.3 Probe
  - 3.3.1 Mechanical Probes
  - 3.3.2 Electronic phased array
  - 3.3.3 Echocardiography- 2D mode, M mode, 3D

## **Unit4. Principles of Doppler**

- 4.1 Introduction
- 4.2 The Doppler Wave
- 4.3 Pulse wave Doppler
- 4.4 Continuous Wave Doppler
- 4.5 Color Doppler
- 4.6 Color M Mode(Q mode)

## **Unit5. Advantages, Maintenance and Patient Preparation**

- 5.1 Advantages of Echocardiography
- 5.2 Cleaning, Disinfection & Maintenance
- 5.3 Preparation of Patient
- 5.4 Approach of Tran thoracic Echocardiography
- 5.5 Different Views
  - 5.5.1 Parasternal long Axis View
  - 5.5.2 Parasternal Short Axis View
  - 5.5.3 Apical 4 Chamber View
  - 5.5.4 Subccostal view

## **Unit6. Stress Echocardiography**

- 6.1 Introduction to Stress echo & Contrast echo
- 6.2 Exercise stress echo
- 6.3 Cardiac Medications
- 6.4 Cardiac Emergencies
- 6.5 Cardiac Revascularization
- 6.6 Pharmacological Agents for Stress Echo
- 6.7 Emergency Echocardiography

## **Unit7. Measurement of Cardiac Dimensions**

- 7.1 Evaluation of systolic and diastolic left ventricular function
- 7.2 Regional wall motion abnormalities
- 7.3 Stroke volume and cardiac output assessment
- 7.4 Transvalvular gradients, Orifice area, Continuity equation

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## **THIRD YEAR**

### **BSCC-301- CARDIAC CARE TECHNOLOGY-CLINICAL**

#### **Unit1. Introduction to interventional Cardiology**

- 1.1 Introduction to interventional Cardiology
- 1.2 The selection of patient for Interventional Cardiology
- 1.3 Technical Consideration for performing Percutaneous Coronary Interventions (PCI)
- 1.4 Managing Complications in PCI

#### **Unit2. Instrumentation**

- 2.1 Types of catheters
- 2.2 Catheter cleaning and packing
- 2.3 Techniques of sterilization-advantages and disadvantages of each
- 2.4 Setting up the cardiac catheterization laboratory for a diagnostic study
  - 2.4.1 Table movement
  - 2.4.2 Image intensifier movement
  - 2.4.3 Image play back

#### **Unit3. Basic Cardiac Concepts**

- 3.1 Measuring Intra cardiac pressures
- 3.2 Pressure recording systems
- 3.3 Fluid filled catheters versus catheter tipped manometers
- 3.4 Artifacts
- 3.5 Damping
- 3.6 Ventricularization
- 3.7 Pressure gradient recording pullback
- 3.8 Peak-to peak Cardiac output determination
- 3.9 Thermo dilution method, Oxygen dilution method,
- 3.10 Principles of oximetry
- 3.11 Shunt detection and calculations

#### **Unit4. Vascular Access for Interventional Procedures**

- 4.1 Vascular Access
- 4.2 Complications of Vascular Access
- 4.3 Coronary Artery Access and Guide wire Catheters

#### **Unit5. Basic Coronary Balloon Angioplasty**

- 5.1 Overview of basic PCI Method
- 5.2 Mechanism of Angioplasty
- 5.3 Indications for PCI
- 5.4 PCI Equipments
- 5.5 Stents
- 5.6 Managing Complications During Stent Delivery & Implantation
- 5.7 Clinical Procedures for PCI
- 5.8 Medical Therapy After PCI

## **Unit6. Angiography for Percutaneous Interventions**

- 6.1 Objectives of PCI Angiography
- 6.2 Common Angiographic Views for Angioplasty
- 6.3 Techniques of Coronary Arteriography
- 6.4 Angiographic & Video Imaging System
- 6.5 Medications Used in Coronary Angiography
- 6.6 Pacemakers During PCI

## **Unit7. Complications of Percutaneous Coronary Interventions**

- 7.1 Myocardial Infarction During PCI
- 7.2 Hypotension & Arrhythmias
- 7.3 Peripheral Vascular Complications
- 7.4 Complications of Radiographic Contrast Media

## **BSCCT302-CARDIAC CARE TECHNOLOGY-APPLIED**

### **Unit1. Cardiac Monitoring**

- 1.1 Definition & purpose of cardiac monitoring
- 1.2 How to Recognize various arrhythmias
- 1.3 Methods to set up a intensive coronary care unit
- 1.4 Use fullness of ICCU

### **Unit2. Cardiac Diagnostic Modalities and Diagnosis Interpretation**

- 2.1 Diagnostic Interpretation of TMT report
- 2.2 Criteria for TMT positive test
- 2.3 Contraindication for TMT conditions where TMT is not useful
- 2.4 Complications of TMT room and its management

### **Unit3. Cardiac Emergencies and Management**

- 3.1 Cardiac Arrest – Definition & causes
- 3.2 External cardiac massage
- 3.3 Artificial respiration and other drugs and procedures used in the management of Cardiac arrest
- 3.4 Use of defibrillator
  - 3.4.1 Indications
  - 3.4.2 How to use the defibrillator
  - 3.4.3 Complications during the procedure and its management

### **Unit4. Management of Angina**

- 4.1 Introduction and Classification of Angina
- 4.2 Treatment of Stable Angina
- 4.3 Management of Unstable Angina
- 4.4 Variant Angina

### **Unit5. Management of Acute Myocardial Infarction**

- 5.1 Introduction to MCI
- 5.2 Coronary Care Therapeutics
- 5.3 Limitation of Infarct Size and Increased Survival
- 5.4 Drugs in MCI: Overview
- 5.5 Management of Complications of Infarction

### **Unit6. Management of Heart Failure**

- 6.1 Introduction
- 6.2 Diagnosis
- 6.3 Basic Cause
- 6.4 Factors Precipitating Heart Failure
- 6.5 Specific Treatment of Heart Failure
- 6.6 Vasodilators
- 6.7 Diuretics
- 6.8 Beta Blockers
- 6.9 Management of Pulmonary Edema

## **Unit7. Management of Cardiac Arrhythmias**

- 7.1 Introduction and Classification
- 7.2 Diagnosis
- 7.3 Management of Supraventricular Arrhythmia
- 7.4 Ventricular Arrhythmia
- 7.5 Ventricular Tachycardia
- 7.6 Antiarrhythmic Agents and their Classification: Overview

## **Unit8. Cardiac Arrest**

- 8.1 BLS
- 8.2 ACLS

## **Unit9. Management of Infective Endocarditis**

- 9.1 Introduction, Classification and Diagnosis
- 9.2 Prophylaxis of Bacterial Endocarditis

## **Unit10. Cardiac Drugs during Pregnancy**

- 10.1 Anti Hypertensive Agents in Pregnancy
- 10.2 Drug Therapy for Heart Failure in Pregnancy
- 10.3 Antiarrhythmic Agents in Pregnancy
- 10.4 Cardiac Drugs during Lactation

## **BSCC-302-CARDIAC CARE TECHNOLOGY-ADVANCED**

### **Unit1. Aortic Angiography:**

- 1.1 Aortic root, arch, abdominal aorta
- 1.2 Peripheral angiography and carbon dioxide angiography
- 1.3 Catheterization and angiography in children with congenital heart disease,

### **Unit2. Contrast Agents:**

- 2.1 Definition
- 2.2 Classification- Positive, Negative, HOXM, LOXM, Ionic, Non Ionic
- 2.3 Routes of Contrast Media Administration
- 2.4 Reactions of Contrast media
- 2.5 Management of Contrast Media Reactions
- 2.6 ABCD Management

### **Unit3. Coronary angioplasty (PTCA):**

- 3.1 Equipment and hardware used in PTCA
- 3.2 Setting up the laboratory for a PTCA
- 3.3 Case Management of complications: Slow flow/no flow, acute stent thrombosis
- 3.4 Dissection, Perforation

### **Unit4. Pediatric Interventions:**

- 4.1 Aortic and pulmonary valvuloplasty
- 4.2 Coarctation angioplasty and stenting
- 4.3 Device closure of PDA, ASD, VSD, Technique and devices used, Sizing of devices & Coil

### **Unit5. Balloon Mitral Valvuloplasty (BMV):**

- 5.1 Techniques and hardware used in BMV
- 5.2 Setting up the laboratory for a BMV case

### **Unit6. Trans Septal Puncturing**

- 6.1 Technique and equipment used for trans-septal puncture
- 6.2 Recording of transmitral pressure gradients
- 6.3 Management of cardiac tamponade
- 6.4 Peripheral interventions, Equipment and techniques used
- 6.5 Endovascular exclusion of aneurysms

### **Unit7. IABP Techniques**

- 7.1 Self-expanding stents, covered stents and cutting balloons
- 7.2 Intra-aortic balloon pump (IABP)
- 7.3 Theory of intra -aortic balloon counters pulsation
- 7.4 Indications for IABP use
- 7.5 Setting up the IABP system

## **Unit8. Thromboembolic Diseases & Diagnosis**

- 8.1 Introduction, indications and use of vena caval filters
- 8.2 Techniques of thrombolysis
  - 8.2.1 Drug and catheters used
- 8.3 Thrombus aspirations systems – coronary & peripheral

## **Unit9 Cardiac Pacing**

- 9.1 Temporary pacing
  - 9.1.1 Indications
  - 9.1.2 Technique
- 9.2 Permanent pacing
  - 9.2.1 Indications
  - 9.2.2 Types of pacemakers and leads
  - 9.2.3 Setting up the laboratory for permanent pacing
  - 9.2.4 Pacemaker parameter checking
- 9.3 Follow-up of pacemaker patients,

## **Unit10. Cardiac Electrophysiology**

- 10.1 Catheters used in electrophysiology studies
- 10.2 Connection of catheters during an EP study
- 10.3 Equipment used in arrhythmia induction and mapping
- 10.4 Radiofrequency ablation
- 10.5 Image archival systems and compact disc (CD) writing