

**ANDHRA PRADESH PARA MEDICAL BOARD  
HYDERABAD**

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**Syllabus for  
DIPLOMA IN CARDIOLOGY TECHNICIAN COURSE  
(TWO YEARS COURSE)**

**B.N.S. Kumar  
Secretary**

In view of representation from the Faculty in Government colleges, in State of AP.  
 The Syllabus for the 1<sup>st</sup> year in all Para medical courses is modified accordingly the  
 modified Syllabus for 1<sup>st</sup> year is kept on website.

<b>DIPLOMA IN CARDIOLOGY TECHNICIAN COURSE (TWO YEARS COURSE)</b>	
<b>Syllabus for First Year</b>	
<b>Paper-I</b>	<p><b><u>BASIC HUMAN SCIENCES</u></b></p> <p>A) Basics of Anatomy            B) Basics of Physiology            C) Basics of Bio-chemistry            D) Basics of Bio-statistics</p>
<b>Paper-II</b>	<p><b><u>PHYSICAL SCIENCES</u></b></p> <p>A) Basics of Pathology            B) Basics of Blood Banking            C) Basics of Microbiology            D) Basics of Central sterilization.</p>
<b>Paper-III</b>	<p>A) Hospital awareness,            B) Familiarization of different tables/tubes in surgical dept. Surgical Awareness, Preparation of patient for surgery.            C) Patient related services.            D) Communication &amp; Computer Skills,            Audio And Visual Aids</p>

**DIPLOMA IN CARDIOLOGY TECHNICIAN COURSE  
(TWO YEARS COURSE)**

**Syllabus for Second Year**

<b>Paper-I</b>	<p>A) Clinical Cardiology, <b>Congestive heart diseases</b>, Physical set up of Cardiology and OPD Lab Procedures</p> <p>B) <b>Cardiac arrest, Heart Failure.</b></p> <p>C) <b>Myocarditis, Peripheral vascular diseases. Shock.</b></p> <p>D) <b>Prevention &amp; treatment of heart disease</b></p>
<b>Paper-II</b>	<p>A) Hypothermia, Pharmacology, Classification, signs and symptoms, causes, management</p> <p>B) <b>External Pacemaker, ECG Reading of normal &amp; abnormal ECG.</b> Cardio Vascular System.</p> <p>C) <b>Introduction to cardiac catheterization</b></p> <p>D) <b>Cardio pulmonary resuscitation (CPR),</b> Cardiac Profile Tests</p>
<b>Paper-III</b>	<p><b>A) Introduction of ICU, and its structure, Furniture.</b> <b>Utensils used,</b></p> <p><b>B) Oxygen application</b></p> <p><b>C) Emergency disaster &amp; death, Mobile ICU</b> <b>Medico legal aspect.</b></p> <p><b>D) Instrumentation Study, Instrument Measurement &amp; Critical Care</b> <b>Equipment.</b></p>

# 1<sup>st</sup> YEAR

## PAPER-I

### Basics of Anatomy & Physiology

#### **Basics of Anatomy**

1. Introduction to Human Anatomy
2. Cell- Tissues Properties, Different Tissues
3. Digestive System & Hepatobiliary System
4. Respiratory System
5. Cardio Vascular System
6. Lymphatic System
7. Bones and Joints
8. Nervous System
9. Endocrine System
10. Sense Organs
11. Excretory System
12. Reproductive System

#### **Basics of Physiology**

1. Introduction to Human Physiology
2. Blood
3. Cardio Vascular System
4. Lymphoid System
5. Digestive System
6. Respiratory System
7. Nervous System
8. Endocrine System
9. Excretory System
10. Reproductive System
11. Sense Organs

## **Basics of Bio – Chemistry**

1. Introduction to Basics of Bio-chemistry including code of ethics for Medical Lab Technicians and Medical Lab Organization.
2. Reception, Registration and bio-chemical parameters investigated.
3. Glassware and plastic ware used in a bio-chemical laboratory.
  - a. **Glassware:**
    - 1) Types of glass and composition.
    - 2) Types of glassware used, their identification, application & uses.
    - 3) Cleaning, drying, maintenance and storage of glassware.
  - b. **Plastic ware: Brief outline**
4. Instrumental methods of Bio-chemical analysis.
  - a. **Colorimetry :**

Visual and photoelectric methods, instrumentation, principle & laws involved construction, operation, care and maintenance, applications.
  - b. **Spectrophotometry**

Principle and theory, types, construction, & applications
5. Basic lab operations like
  - a. **Separation of solids from liquids**
    1. Centrifugation: Principle, Different types of centrifuges care and maintenance, applications.
    2. Filtration using funnel.
    3. Weighing : Different types of balances used, care and maintenance.
    4. Evaporation
    5. Distillation
    6. Refluxing
    7. Drying different salts and dessicotion.

6. Water Chemicals and related substances
  - a. Purity of chemicals
  - b. Corrosives
  - c. Hygroscopic Substance
7. Prevention, Safety and first aid in lab accidents.
8. Collection of Specimens
  - a. **Blood:** Types of Specimens, Collection, Precautions during collection processing and preservation.
  - b. **Urine:** Types of Specimens, Collection, Precautions during collection, Processing and Preservation.
9. Urine biochemical parameters.
10. Units of measurements
11. **Solutions** : Types based on solute and solvent, Types based on method of expressing concentration, calculations.
12. **Carbohydrates:** Definitions, Biological importance, Acid value, iodine value, saponification value.
13. Amino acids and Proteins Definition, Biological importance, Classification, Qualitative tests.
14. **Diagonistic tests** : Blood sugar, Glucose tolerance test, Blood urea, Serumuric acid, Serum creatinine.
15. **Vitamins and Minerals**
  - a. **Vitamins:**  
Water Soluble vitamins, Fat Soluble vitamins, Sources, Daily requirements, Deficiency diseases.
  - b. **Minerals :**  
Sources, Daily requirements, Deficiency diseases.

# Paper-II

## Basics of Pathology

### Introduction to Pathology in brief

1. Urine – Analysis – Physical Examination – specific gravity PH, reaction, colour.  
Chemical Examination – Sugar Albumin, bile salts, bile Pigments etc.  
Microscopic, Sediment for RBC, WBC, Epitheleal cells, casts, crystals, parasites.  
Preparation of Reagents, procedure and principle of tests.
2. **Sputum Analysis** – Physical Examination, Preparation and staining smear for Microscopic Examination.
3. **Semen Analysis** – Physical Examination Microscopy – counting, motility, staining, Morphology, abnormal and normal forms.
4. **Body Fluids** – Differential count of Peritoneal, pericardial, pleural fluids and CSF, charging chamber, Identifying and counting the cells.

# Basics of Microbiology

## I. Introduction to Microbiology in brief

Definition,  
History

## II. Microscopy

- a) Principle working and maintenance of compound Microscope.
- b) Principle of Fluorescent microscope, Electron Microscope, Dark Ground Microscope.

### **History**

**Types of Microscope:** (a) Light Microscope, (b) DGI, (c) Fluorescent, (d) Phase contrast.

**(e) Electron Microscope :** a). Transmission, b) Scanning, Principles of operational mechanisms of various types of Microscopes.

## III. Sterilization and disinfection – classification and Methods of sterilization.

### **Sterilization: Definition, types and principles of sterilization methods:**

(a) Heat (dry heat, moist heat with special reference to autoclave, (b) Radiation, (c) Filtration, efficiency testing to various sterilizers.

### **Antiseptics and Disinfectants :**

Definition, types and properties, mode of action, uses of various disinfectants, precautions while using the disinfectants, qualities of a good disinfectants, testing efficiency of various disinfectants.



- 1) Principle and Methods of sterilization by heat
  - a) By Dry Heat, flaming, Red Heat, Hot air oven, incineration.
  - b) By Moist Heat-pasteurization, Inspissation, tyndalisation, autoclave.

2) Filtration Methods

- 3) Ionising Radiation – Disinfection, Mode of action and uses of important chemical disinfectants – Phenol and Phenolic compounds, alcohols, halogens, dyes and acids and alkalis.

4) Gaseous Methods of sterilization.

- IV. Cleaning, drying & Sterilization of Glassware disposal of contaminated material i.e. clinical infective material inoculated culture media. Handling and Disposal of Biomedical waste.
- V. **Biomedical waste management in a Microbiology Laboratory** : types of the waste generated, segregation, treatment, disposal.
- VI. Morphology and classification of Bacteria Sp. of cell, capsule, flagella, spore, Anaerobic Methods of cultivation of Bacteria.

# Paper-III

## **A. Hospital Awareness**

A brief idea of hospital as an organization management different units of a hospital effective communication skills, communication channel

Maintenance of records  
Effective leadership  
General patient care  
Medical terminologies  
Vital signs  
Unit preparation  
Transporting & Transferring patients  
Sterilization Techniques  
Control of infection  
Medication – Oral & parenteral  
Admission – Discharge procedure  
Bandages

Practicals : Posted in ward & taught clinically

## **A. Surgical Department**

Familiarization of different tubes

1. Drainage tube
2. Post Operative Exercises
3. Post OP Management of Patient
4. Shock of Management
5. Changing Surgical Dressing.

1. Preoperative preparation of patient
2. Preanesthetic preparation
3. Assisting in operation
4. Anaesthesia
5. CSSD
  1. Recovery room
  2. Movement of papers
  3. Scheduling of theaters
  4. Supplying of articles
  5. Specific area practices
    - a. As scrubnurse
    - b. As circulating nurse

## **D).Communication and Computer Skills, Audio & Visual Aids.**

### **COMMUNICATION**

Process  
Types of communication  
Strategies for effective Communication  
Barriers of communication

### **SOFT SKILLS**

Presentation with the use of visual aids such as power point  
Conversation  
Extempore speech, usage of effective language for communication of health work.  
Case studies and situational analysis  
Survey and Reporting

### **COMPUTER**

Computer basic  
MS – Office  
MS – Word  
MS – Excel  
MS – Power Point

### **INTERNET CONCEPTS**

Browsing  
Down- Loading  
Use of Slide Projector

## SECOND YEAR PAPER I

### CLINICAL CARDIOLOGY

Cardiac Arrhythmia, Congenital heart disease, Infective Endocarditic  
Valvular diseases, Ischemic heart disease, Cardiac arrest, Heart Failure.  
Hypertension, Pericarditis, Myocarditis, Peripheral vascular diseases. Shock  
Health & heart diseases, Epidemiology of heart disease. Early detection,  
Prevention & treatment of heart disease Common warning signs of heart diseases  
Obesity

## PAPER II

### ELECTRO CARDIO GRAPHY. (ECG)

#### a) Basic E.C.G. concepts :

1. Electro Physiology, Einthoven's Law, The Hexaxial System.
2. The 12 lead System
3. Normal E.C.G. Reading, Abnormal E.C.G
4. Recognition of Myocardial Infarction, Basic Arrhythmias and Conduction disturbances
5. Treatment of the above conditions : basic concepts

#### b) E.C.G. Machines :

1. Operation and maintenance of E.C.G. machines.
2. Identification of basic defects and repair.

Safety Standards of E.C.G. Machines.  
External Pacemaker, Pediatric ECG Recording,  
Reading of normal & abnormal ECG.  
Stress ECG recording.  
Introduction to cardiac catheterization  
Control oxygen & section unit, TMT,  
Echo, Ultrasound dropper,  
Demonstration of working of all instruments & using it.

### **Cardiopulmonary resuscitation**

Respiratory distress,  
IV Infusion & precaution,

### **Hypothermia**

Classification, signs and symptoms, causes, management

### PAPER III

ICU: - Introduction, structure, Furniture.

Utensils used,

Assessment of patient condition, treatment protocol

Medicines used in ICU & ITS role, Repair; standby power arrangement of beds, Trays & trolleys & attendants space

Infections & disinfectant procedures, Sterilization of ICU articles & Room, Importance of Disinfectant & sterilization,

Detail of Types mode & Source of infections in ICU.

Use of antiseptic technique, Diet & nutrition of patient.

Duty record, division of work, disposal of materials,

Collection & transportation of body sample

Minor routine & emergency procedures like RT,

Catheterization, enema, Oxygen application, Laryngoscope & tracheotomy, Routine cleaning of ICU,

Admission protocol, Record keeping, Operative preparation.

Electric & fire hazards, Recovery room, Stock maintenance of the department,

Emergency disaster & death, Mobile ICU

Medico legal aspect.

#### **List of Practicals:**

1. Operation, Calibration, and Servicing of E.C.G. machines.
2. E.C.G. Recording – in Adult & pediatric patients.
3. Stress E.C.G. Recording.
4. Holter Recording.
5. Recording and interpretation of Blood Pressure.
6. Operation of Echocardiographic equipment and maintenance.
7. Operation of the control system in C.C. Lab.
8. Operation of blood Oximeter.
9. Operation of Tagarno
10. Monitoring in I.C.C.U.
11. Operation of Film Processing machine.
12. Operation of CD recording in C.C. Lab.
13. Assisting during Temporary and Rermanent pacing.
14. Cardio Pulmonary Resuscitation.