Syllabus and Curriculum
of
Diploma in Cardiology Technician course

(To be implemented From 2015 - 16 session)

Uttar Pradesh State Medical Faculty, Lucknow.

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OBJECTIVES OF THE COURSE

To prepare a **Cardiac technician** who -

- Can work in ICU / ICCU and Cardiac catheterization lab.
- Can record vitals (manually and with multiparameter monitor), ECG and TMT.
- Can help in Echo- Cardiography, Cardiac catheterization.
- Can perform BLS & help in ACLS implementation.
- Can perform basic nursing procedures like IV/IM/SC injections, Nebulization, Oxygen therapy, use of infusion pump.
- Can use emergency drugs supporting the heart under guidance of doctor.
- Can provide Psychological support to the patient & counsel him & his/her relatives.

Outline of Curriculum of Diploma in Cardiology Technician course

FIRST YEAR

THEORY (Classes: 9 AM to 12 Noon)

First paper : **Syllabus covers** -
1. General Anatomy & Physiology (Cytology, Histology, Osteology and only basics of all organ systems of body). 2. Only basics of relevant Pathology, Pharmacology & Microbiology. 3. Basic Physics related to cardiology.

Second paper : **Syllabus covers** -
1. Detailed Cardiovascular system's Anatomy & Physiology (Heart & Blood vessels). 2. Basics of Vital monitoring, ECG, TMT, Echo- Cardiography. 3. Hand hygiene & prevention of cross infection. 4. Basic life support (BLS) & Cardio-pulmonary resuscitation (CPR).

FIRST YEAR

PRACTICAL (Classes: 1 PM to 4 PM)

Practical classes will be after lunch; from 1 PM to 4 PM.

Students must present in the hospital/ cardiac lab for practicals.

During first year, they should be there only as "Observers" in practical classes.

(Observership for ECG electrode placement, Vital monitoring, TMT, Echo- Cardiography ,Use of different drugs).

Following subjects must be taught; though there will not be any exam from these-
1. Basic Computer skills. 2. Basic English. 2. **Soft skills like** - Interpersonal relationship skills & moral education. .

Outline of Curriculum of Diploma in Cardiology Technician course

SECOND YEAR

THEORY (claases:9 AM to 12 Noon)

First paper : **Syllabus covers -**
1. Only relevant surgical & medical conditions (relevant to cardiac tech but other than cardiology). 2. Nursing Procedures like vital recording, IM/IV/SC injection, Oxygen therapy, Nebulization, IV infusion. 3. Advanced cardiac life support (ACLS).

Second paper : **Syllabus covers -**
1. Diseases related to Cardio-vascular system (CVS). 2. Drugs used in Cardiology & BLS, ACLS. 3. Details about BLS, ACLS, Cardiac- Catheterization, Coronary angiography and angioplasty. 4. Basic biomedical engineering physics of ECG, ECHO, TMT, multipara monitors Cath.lab etc.

SECOND YEAR

PRACTICAL (claases:9 AM to 12 Noon)

Practical exams syllabus should cover-

- Hands on training of Vital Monitoring (invasive & non-invasive).
- Hands on training of ECG, ECHO, TMT, multipara monitor , Cardiac catheterization.
- Hands on training of BLS & ACLS.
- Hands on training of use of drugs used in ICCU.

ELIGIBILITY CRITERIA FOR ADMISSION & DURATION OF THE COURSE

COURSE DURATION:-

- It is 2 years, **full time** Diploma Course.

ELIGIBITY:-

- Candidate must have passed 12th with

  Physics, Chemistry, Biology

  Or

  Physics, Chemistry, Maths

  with 35% marks in Intermediate exams.

  (From UP board or any other recognised board).

- Candidate must have completed age of 17 years of age as on 31st December of admission year. There is no maximum age limit for the admission.

SCHEDULE OF EXAMINATION

FIRST YEAR

Paper	Subjects	Mark	Internal Assessment Marks	Total Marks	Pass Marks	Duration of Exam.
First Paper Theory	**1**.General Anatomy & Physiology (Cytology, Histology, Osteology and only basics of all organ systems of body). **2**.Only basics of relevant Pathology, Pharmacology & Microbiology. 3.Basic Physics related to cardiology	75	25	100	50	3 Hours
Second Paper Theory	**1**.Detailed Cardiovascular system's Anatomy & Physiology (Heart & Blood vessels). **2**.Basics of Vital monitoring, ECG, TMT, Echo- Cardiography. **3**.Hand hygiene & prevention of cross infection. **4**.Basic life support (BLS) & Cardio-pulmonary resuscitation (CPR).	75	25	100	50	3 Hours
Practical	Oral & Practical	75	25	100	50	3 Hours

SCHEDULE OF EXAMINATION

SECOND YEAR

Paper	Subjects	Mark	Internal Assessment Marks	Total Marks	Pass Marks	Duration of Exam.
First Paper Theory	**1.**Only relevant surgical & medical conditions (relevant to cardiac tech but other than cardiology). **2.**Nursing Procedures like vital recording, IM/IV/SC injection, Oxygen therapy, Nebulization, IV infusion. **3.** Advanced cardiac life support (ACLS).	75	25	100	50	3 Hours
Second Paper Theory	**1**.Diseases related to Cardio-vascular system (CVS). **2**.Drugs used in Cardiology & BLS, ACLS. **3**.Details about BLS, ACLS, Cardiac-Catheterization, Coronary angiography and angioplasty. **4**.Basic biomedical engineering physics of ECG, ECHO, TMT, Cath.lab etc.	75	25	100	50	3 Hours
Practical	Oral & Practical	75	25	100	50	3 Hours

SCHEDULE OF COURSE

(List of holidays, Total hours, Subject wise allottement of hours)

- **List of Holidays:-**

Sundays	- 52 days
Summer vacation	- 10 days
Winter vacation	- 10 days
Gazetted holidays	- 23 days
Preparatory holidays	- 10 days
Total Holidays	- 105 days

- **Total Hours :-**

Theory classes per day	- 3 Hours
Practical classes per day	- 3 Hours
Total hours per day	- 6 Hours
Total days & hours in One year (after deduction of holidays)	- 260 days or - 1560 Hours

SCHEDULE OF COURSE

Subject wise allottement of hours

FIRST YEAR

Theory (780 Hours) Practical (780 Hours)

First Paper Theory	**1**.General Anatomy & Physiology (Cytology, Histology, Osteology and only basics of all organ systems of body).	300 Hrs
	2.Only basics of relevant Pathology, Pharmacology & Microbiology.	100 Hrs
	3.Basic Physics related to cardiology.	40 Hrs
Second Paper Theory	**1**.Detailed Cardiovascular system's Anatomy & Physiology (Heart & Blood vessels).	100 Hrs
	2.Basics of Vital monitoring, ECG, TMT, Echo- Cardiography.	100 Hrs
	3.Hand hygiene & prevention of cross infection.	30 Hrs
	4.Basic life support (BLS) & Cardio-pulmonary resuscitation (CPR).	40 Hrs
Third Paper Practical	As described in curriculum	780 Hrs
Theory: Other Subjects (These subjects must be taught; though there will not be any exam from these)	**1**.Basic Computer skills.	30 Hrs
	2.Basic English.	30 Hrs
	3.Soft skills like - Interpersonal relationship skills & moral education	10 Hrs

SCHEDULE OF COURSE

Subject wise allottement of hours

SECOND YEAR

Theory (780 Hours) Practical (780 Hours)

First Paper Theory	**1.**Only relevant surgical & medical conditions (relevant to cardiac tech but other than cardiology).	250 Hrs
	2.Nursing Procedures like vital recording, IM/IV/SC injection, Oxygen therapy, Nebulization, IV infusion.	20 Hrs
	3. Advanced cardiac life support (ACLS). .	20 Hrs
Second Paper Theory	**1**.Diseases related to Cardio-vascular system (CVS).	140 Hrs
	2.Drugs used in Cardiology & BLS, ACLS.	60 Hrs
	3.Details about BLS, ACLS, Cardiac- Catheterization, Coronary angiography and angioplasty.	230 Hrs
	4.Basic biomedical engineering physics of ECG, ECHO, TMT, Cath.lab, multi para monitors etc.	60 Hrs
Third Paper Practical	As described in curriculum	780 Hrs

Details of Curriculum for First Year Diploma in Cardiology Technician

PAPER 1st Theory	Topics	Hours.
1.General Anatomy & Physiology (Cytology, Histology, Osteology and only basics of all organ systems of body).	**1.** General Orientation about parts of human body. Various terms used in Anatomy. Total numbers of bones, their names & location. Basic idea about organzation of body ,from cell to organ systems.	06 Hrs
	2. Structure of Animal cell, Cell organelles & their functions	06 Hrs
	3. Human tissue, types, structure & functions.	10 Hrs
	4. Osteology: Names, location, identification and basic details of all bones. (Details of skull bones is not required).	20 Hrs
	5. Joints: types, basic structure & examples.	06 Hrs
	6. Skin & appendages.	02 Hrs
	7. GIT: : Location, Gross structure, various parts & their functions. Details of process of food ingestion, digestion, absorption & defaecation. (Microscopic structure is not required.)	30 Hrs
	8. Respiratory tract: Location, Gross structure, various parts & their functions. Details of breathing mechanism, different respiratory volumes. (Microscopic structure is not required.)	30 Hrs
	9. Urinary tract: Gross structure, various parts & their functions. (Microscopic structure is not required.) Process of urine formation & voiding.	20 Hrs
	10. Male reproductive system: Only gross structure & functions of different parts. (Microscopic structure is not required.)	10 Hrs
	11. Female reproductive system: Only gross structure & functions of different parts. (Microscopic structure is not required.) Menstrual cycle.	10 Hrs

Details of Curriculum for First Year Diploma in Cardiology Technician

PAPER 1st Theory	Topics	Hours.
1.General Anatomy & Physiology (Cytology, Histology, Osteology and only basics of all organ systems of body).	**12.** Endocrine system: Hormones secreted by Pituitary, Thyroid, Parathyroid, Pancreas, Adrenal cortex, Adrenal medulla, Gonads & functions of different hormones. (Details of structure of these glands not required).	20 Hrs
	13. Gross structure of brain & spinal cord. Functions of different parts of brain & spinal cord.(Details not required.)	20 Hrs
	14. Blood: Composition & Functions. Details about Plasma, RBCs, WBCs, Platelets, Clotting system.	30 Hrs
	15. Gross structure & functions of sensory Organs - Eye, Ear, Nose, Tongue.(Details not required).	20 Hrs
	16. Basic gross structure of heart, vessels opening into heart & Leaving the heart. Arterial & Venous tree of body.	20 Hrs
	17. Lymphatic system: Structure & Functions.	10 Hrs
	18. Inumune system: Components & various mechanisms of defense.	20 Hrs

Details of Curriculum for First Year Diploma in Cardiology Technician

PAPER 1st Theory	Topics	Hours.
2.Only basics of relevant Pathology, Pharmacology & Microbiology.	1. Basic steps of Acute & chronic inflammation.	03 Hrs
	2. Basics of Necrosis & apoptosis. Atherosclerosis.	03 Hrs
	3. Basics of Shock.	03 Hrs
	4. Basics of Disorders of blood coagulation system.	08 Hrs
	5. Basics of Disorders of Immune system of body.	05 Hrs
	6. Modes of disease transmission & prevention of infection.	05 Hrs
	7. Sterilization & methods of sterilization used in hospitals.	10 Hrs
	8. Basic idea about types of Bacteria, Virus, Fumgi.	20 Hrs
	9. Rouths of drug administration.	02 Hrs
	10. Adverse effects & side effects of drugs. 11.	02 Hrs
	12. Basic idea of Analgesics : Opioid & NSAIDs.	02 Hrs
	13. Basic idea of Drugs use in Cough & expectoration.	02 Hrs
	14. Basic idea of Drugs used in B.asthma & COPD.	02 Hrs
	15. Basic idea of Drugs used in GIT.	08 Hrs
	16. Basic idea of Anti Microbials.	20 Hrs
	17. Basic idea of Anti H-1 Histaminics & Corticosteroids.	02 Hrs
	18. Basic idea of Diuretics.	03 Hrs

Details of Curriculum for First Year Diploma in Cardiology Technician

PAPER 1st Theory	Topics	Hours.
3.Basic Physics related to cardiology.	1. Principles of AC & DC.	10 Hrs
	2. Ohm's law.	10 Hrs
	3. Types of batteries & power supply.	10 Hrs
	4. Electrodes.	10 Hrs

Details of Curriculum for First Year Diploma in Cardiology Technician

PAPER 2nd Theory	Topics	Hours.
1.Detailed Cardiovascular system's Anatomy & Physiology (Heart & Blood vessels).	1. Details of sternum, ribs & dorsal vertebrae.	05 Hrs
	2. Detaited structure of Mediastinum. Contents of Mediastinum.	05 Hrs
	3. Gross structure of Heart & precordial surface markings.	10 Hrs
	4. Histology of Heart.	05 Hrs
	5. Great vessels.	05 Hrs
	6. Systemic & Pulmonary Cirurtation	05 Hrs
	7. Blood supply of Heart.	05 Hrs
	8. Nerve supply of Heart.	02 Hrs
	9. Cardiac cycle.	12 Hrs
	10. Cardiac out put & stroke voloure.	06 Hrs
	11. Cardiac sounds.	05 Hrs
	12. Conduction system of Heart.	05 Hrs
	13. Blood pressure.	05 Hrs
	14. Pulse.	05Hrs
	15. General structure of Arteries, veins, capillaries.	05 Hrs
	16. Arterial & Venous tree of body.	15 Hrs

Details of Curriculum for First Year Diploma in Cardiology Technician

PAPER 2nd Theory	Topics	Hours.
2.Basics of Vital monitoring, ECG, TMT, Echo-Cardiography.	1. Temperature monitoring & Fever.	05 Hrs
	2. Pulse monitoring & applied aspects.	05 Hrs
	3. Blood Pressure monitoring (manual).	05 Hrs
	4. Respiration monitoring.	05 Hrs
	5. Placing & using multipara-monitors.	10 Hrs
	6. ECG recording.	30 Hrs
	7. Basics of ECG.	10 Hrs
	8. Common anomalies of ECG & their interpretation.	10 Hrs
	9. Basics of TMT.	10 Hrs
	10. basics of Echo-cardiography	10 Hrs

PAPER 2nd Theory	Topics	Hours.
3.Hand hygiene & prevention of cross infection.	1. Hand hygiene & method of Hand washing.	15 Hrs
	2. Prevention of cross infection.	15 Hrs

PAPER 2nd Theory	Topics	Hours.
4.Basic life support (BLS) & Cardio-pulmonary resuscitation (CPR).	1. Code blue.	05 Hrs
	2. Details of basic life support (BLS) & Cardio-pulmonary resuscitation (CPR).	35 Hrs

Curriculum
for
Practical :- First Year
Diploma in Cardiology Technician

	Topics
Practical	1.Orientation for Cardiac technician towards importance & need of the technician.
	2.Care of Unconscious patient.
	3.Monitoring Temperature(manual).
	4.Monitoring Pulse (manual).
	5.Monitoring Respiration (manual).
	6.Monitoring BP (manual).
	7. Monitoring Temperature (with Multiparamonitor).
	8.Monitoring Pulse (with Multiparamonitor).
	9.Monitoring Respiration (with Multiparamonitor).
	10.Monitoring BP (with Multiparamonitor).
	11.Invasive monitoring.
	12.ECG procedure (as technician).
	13.Echo- Cardiography procedure (as assistant).
	14.Basic life support (BLS).

Details of Curriculum for Second Year Diploma in Cardiology Technician

PAPER 1st Theory	Topics	Hours.
1.Only relevant surgical & medical conditions (relevant to cardiac tech but other than cardiology).	1. History taking. General examination of the patient. Filling Case-sheet. Common clinical words.	15 Hrs
	2. Hypertension:- Def, Causes, Pathology, Clinical fectures, Investigation & Management.	05 Hrs
	3. Hypotension :- Def, Causes, Pathology, Clinical fectures, Investigation & Management.	02 Hrs
	4. Diabetes mellitus :- Def, Causes, Pathology, Clinical fectures, Investigation & Management.	10 Hrs
	5. Diseases of blood :- Anaemia, Basics of coagulation Bleeding disorders & Haemophilia.	30 Hrs
	6. Respiratory Tract :- Pneumonia, Tuberculosis, B.asthma, COPD, Bronchiectasis, Collapse of lung, Pneumonitis, Pleural effusion, Pneumothorax, Empyema thoracis, Cancer lung.	50 Hrs
	7. Diseases of GIT & Liver & GB :-Reflux Oesophagitis, Peptic ulecrs, Gastritis, Instestinal Obstruction, Hepatitis, Cirrhosis of liver, Cholecystitis.	40 Hrs
	8. Diseases of Nervous system:- Stroke, Meningo-encephalitis, Glasgow coma scale, Epilepsy, Head Injury.	30 Hrs
	9. Diseases of Urinary tract:- Urolithiasis, Benign prostatic hyperplasia.	13 Hrs
	10. Endocrine system :- Diabetes mellitus, hypo & Hyper thyroidism.	10 Hrs
	11. Miscellaneous:- Hypo & Hyper Natraemia, Hypo & Hyper Kalaemia, Hypo & Hyper Calcaemia.	10Hrs
	12. Infections diseases :- TB, Typhoid, Malaria, Dengue fever, Leprosy, AIDS, Amoebiasis.	30 Hrs

Details of Curriculum for Second Year Diploma in Cardiology Technician

PAPER 1st Theory	Topics	Hours.
2.Nursing Procedures like vital recording, IM/IV/SC injection, Oxygen therapy, Nebulization, IV infusion.	1. Temperature monitoring & Fever.	02 Hrs
	2. Pulse monitoring.	02 Hrs
	3. BP monitoring.	02 Hrs
	4. Respiration monitoring.	01 Hrs
	5. Types of Injection routes.	01 Hrs
	6. IM Injection.	01 Hrs
	7. IV Injection.	01Hrs
	8. SC Injection.	01 Hrs
	9. Oxygen Therapy.	03 Hrs
	10. Nebulization	03 Hrs
	11. IV Infusion (Also with infusion pump).	01 Hrs
	12. Care of Unconscious patient.	02 Hrs

PAPER 1st Theory	Topics	Hours.
3. Advanced cardiac life support (ACLS).	**1.** Advanced cardiac life support (ACLS).	20 Hrs

Details of Curriculum for Second Year Diploma in Cardiology Technician

PAPER 2nd Theory	Topics	Hours.
1.Diseases related to Cardio-vascular system (CVS).	1. Auscultation & Heart Sounds.	05 Hrs
	2. Hypertensive vascular disease and hypertensive emergencies.	05 Hrs
	3. Cardiogenic shock.	05 Hrs
	4. Congestive Heart failure.	05 Hrs
	5. Cardiac arrest.	10 Hrs
	6. Ischemic heart disease.	20 Hrs
	7. Valvular heart diseases.	20 Hrs
	8. Rheumatic heart diseases.	20 Hrs
	9. Congenital heart diseases.	20 Hrs
	10. Cardiac arrhythmia.	10 Hrs
	11. Infective endocarditis.	05 Hrs
	12. Pericarditis & pericardial effusion.	05 Hrs
	13. Myocarditis & cardiomyopathies.	05 Hrs
	14. Epidemiology of heart diseases.	05 Hrs
	15. Preventive cardiology.	05 Hrs

Details of Curriculum for Second Year Diploma in Cardiology Technician

PAPER 2nd Theory	Topics	Hours.
2.Drugs used in Cardiology & BLS, ACLS.	1. Use of Adrenaline/ Nor-adrenaline.	10 Hrs
	2. Use of Dopamine/ Dobutamine.	10 Hrs
	3. Use of Atropine.	10 Hrs
	4. Use of Anti arrythmic drugs.	10 Hrs
	5. Use of Anti hypertensives.	10 Hrs
	6. Use of DC shock.	05 Hrs
	7. Use of Defibrillator.	05 Hrs

PAPER 2nd Theory	Topics	Hours.
3.Details about BLS, ACLS, Cardiac-Catheterization, Coronary angiography and angioplasty.	1. Basic life support (BLS).	20 Hrs
	2. Advanced cardiac life support (ACLS).	30 Hrs
	3. <u>Cardiac Catheterization, Angiography & Plasty:-</u> Equipments & instruments used, Dyes & drugs used, Indications of procedure, Steps of procedure, Pre and post procedure care of the patients, Part Preparation, before procedure & discharge advices.	180 Hrs

PAPER 2nd Theory	Topics	Hours.
4.Basic biomedical engineering physics of ECG, ECHO, TMT, Cath.lab, multi para monitors etc	1. About Multiparamonitor.	10 Hrs
	2.About ECG machine.	10 Hrs
	3.About Echo-Cardiography machine.	10 Hrs
	4. About TMT.	10 Hrs
	5. About Infusion pump.	10 Hrs
	6. About Defibrillator.	10 Hrs

Curriculum
for
Practical :- Second Year
Diploma in Cardiology Technician

	Topics
Practical	1. IM Injection.
	2. IV Injection.
	3. SC Injection.
	4. Use of Infusion pump.
	5. Nebulisation.
	6. Use of Defibrillator.
	7. Use of TMT machine.
	8. Practical exposure in Cardiac Cath lab(Pre, Intra & Post procedure)
	9. Use of Kits/Cards for Troponin measurements.
	10. Advanced cardiac life support(ACLS training).
	8. Use of ionotropic, chronotropic & dromotropic drugs like Dopdmine, Dobutamine, Adrenaline, NA, Atropine etc.