Pathology

Year: Second Year D.Voc

Teaching and Examination Scheme:

Teaching Scheme (Hrs./Week)			Examination Scheme					Total
			External		Internal			
L	T	P	Theory	Practical	Theory	*C.E.	Practical	
3	-	-	70	-	15	15	-	100

L-Lectures; T-Tutorial; P-Practical; C.E.-Continuous Evaluation

Contents

Sr. No.	Topic	Weightage %	Teaching hours
1	**Unit-1: Introduction of pathology:** • Definition • Types of pathology - histopathology, hematology, chemical etc.	9	10
2	**Unit-2: Techniques for studying pathology:** • Introduction to different techniques • Types of Stains used in Pathological examinations (gram stains, AFB stains, etc.) • Basic microscopy and examinations • Computers in pathology lab	17	18
3	**Unit-3: Outline of Cell injury and pathology:** • Normal cell • Cell adaptation • Etiology of cell injury • Pathogenesis of cell injury • Necrosis and types • Gangrene	19	20
4	**Unit-4: Outline of Immuno-pathology:** • Introduction to Immune System • Types of Immunity • Cells of Immune system	19	20

	• Functions of Immunity • Diseases of Immune System		
5	**Unit-5: Outline of Inflammation and wound healing:** • Introduction • Types of inflammation • Regulation of inflammation • Regeneration, repair, wound healing, healing in specialized tissues • Neoplasia	**19**	**20**
6	**Unit-6: Outline of Haemodynamics disorder**: • Normal water and electrolytes • Acid-base balance and Disturbances in Acid-base balance • Edema and Disturbances in electrolytes • Disturbances in circulating blood : Hyperemia, Congestion • Shock • Thrombosis, Ischemia, Infarction.	**19**	**20**
	Total teaching hours for the academic year		**108**

Pharmacology

Year: Second Year D.voc.

Teaching and Examination Scheme:

Teaching Scheme (Hrs./Week)			Examination Scheme					Total
			External		Internal			
L	T	P	Theory	Practical	Theory	*C.E.	Practical	
3	-	-	70	-	15	15	-	100

L-Lectures; T-Tutorial; P-Practical; C.E.-Continuous Evaluation

Contents

Sr. No.	Topic	Weightage %	Teaching hours
1	**Unit-1: Outline of General Pharmacology:** • Introduction • Definitions • Source of drugs • Distribution of drugs	17	18
2	**Unit-2: Outline of Administration and Fate of Drugs:** • Route of drugs administration • Form of drugs and dosage • Absorption and bioavailability of drugs • Factors affecting drug metabolism • Biotransformation of drugs	17	18
3	**Unit-3: Outline of Drug Action, Receptors and Excretion:** • Methods of prolonging the duration of drug action • Site of drug action • Mechanism of drug action • Adverse drugs reaction in man ±ADR • Manifestation of ADR • Treatment of drug poisoning • Factors modifying the effect of drug • Drug receptors • Dose response relationship • Introduction about excretion of drug • Route other than absorption site	17	18
4	**Unit-4: Outline of drugs acting on different systems:**	17	18

	• Drugs acting on central Nervous System • Drugs acting on Kidney • Drugs acting on GIT • Drugs acting on Respiratory system		
5	**Unit-5: Outline of :** • Drugs acting on skin & mucous membrane • Hormones & related drugs • Drugs affecting blood & blood formation	**17**	**18**
6	**Unit-6: Outline of** : • Autacoids and related drugs • Antiseptics, Disinfectants, Ectoparasiticides • Chelating Agents	**17**	**18**
	Total teaching hours for the academic year		**108**

Microbiology

Year: Second Year D.Voc

Teaching and Examination Scheme:

Teaching Scheme (Hrs./Week)			Examination Scheme					Total
			External		Internal			
L	T	P	Theory	Practical	Theory	*C.E.	Practical	
3	-	-	70	-	15	15	-	100

L-Lectures; T-Tutorial; P-Practical; C.E.-Continuous Evaluation

Contents

Sr. No.	Topic	Weightage %	Teaching hours
1	**Unit-1: Outline of General Bacteriology:** • Introduction and Historical background • Differences between Prokaryotes and Eukaryotes • Morphology and fine structure of Bacteria and Fungi • Function and structure of Cell wall, Cell membrane, Flagella and Capsule in bacteria • Morphology and Cultivation of Animal viruses • Morphology and Replication of Bacteriophage.	15	16
2	**Unit-2: Outline of Microbial Physiology:** • Microbial Nutrition: Requirements for growth, Physical requirements, Chemical requirements. • Culture media: Aerobic, Anaerobic, Selective, Differential, Enrichment. • Microbial growth, Bacterial growth curve, Factors affecting growth.	15	16
3	**Unit-3: Outline of Immunology:** • Introduction to Immunity and Immune system • Types of Immunity • Antigen, Antibody, Antigen - Antibody reactions. • Different Immunological techniques	15	16
4	**Unit-4: Outline of Systemic Bacteriology:** • Gram positive cocci: Streptococci, Staphylococci, Pneumococci. • Gram negative bacilli: Enterobacteriacae group • Gram positive bacilli: Clostridium	15	16

	• Acid fast bacilli: Mycobacterium		
5	**Unit-5: Outline of Disease and Transmission:** • Normal flora of skin, eye, respiratory tract, mouth, intestinal tract, genitourinary tract. • Infection and Mode of Transmission • Events in infection • Nosocomial infections. • Candidiasis, Aspergillosis	**20**	**22**
6	**Unit-6: Outline of Microbial Metabolism**: • Classification and Nomenclature Enzymes • Property of Enzymes • Enzyme mechanisms • Enzyme inhibition and Enzyme regulation • Chemotherapy • Antimicrobial drugs and Mechanism of Antimicrobial agents	**20**	**22**
	Total teaching hours for the academic year		**108**

Applied Medicine

Year: Second Year D.Voc

Teaching and Examination Scheme:

Teaching Scheme (Hrs./Week)			Examination Scheme					Total
			External		Internal			
L	T	P	Theory	Practical	Theory	*C.E.	Practical	
3	-	-	70	-	15	15	-	100

L-Lectures; T-Tutorial; P-Practical; C.E.-Continuous Evaluation

Contents

Sr. No.	Topic	Weightage %	Teaching hours
1	**Unit-1: General Surgery:** • History Taking and clinical examination in Surgery (General & local examination) • Over view of sign & symptoms of abdominal diseases with figure of abdominal organ and organ wise diseases • Visits of OPD, Casualty, OT, wards, laboratory, CSSD etc. • Common surgical emergencies like burns, trauma – abdominal, chest & head, intestinal obstruction & perforation, Appendicitis. • Emergency Resuscitation of above diseases. • Preparation of different trays like **emergency drugs tray**, venesection tray, intubation tray, suturing tray, dressing tray • Common **investigations** like X-Rays, USG, CT-Scan etc. with relevant indication	**15**	**16**
2	**Unit-2: Anaphylactic Shock Management:** • Wound • Ulcer • Inflammation, Abscess • Medico legal record maintenance • Ethics & Consent • Sterilization	**15**	**16**
3	**Unit-3: General Medicine:** • History taking & clinical examination in Medicine (General & systemic Examination)	**15**	**16**

	• Overview of sign and symptoms of abdominal diseases with figure of abdominal organ and organ wise diseases • Overview of Common medical emergencies like poisoning, snake bite, convulsions, MI, status asthmatics, status epileptics, acute LVF, acute pulmonary Embolism, unstable angina, Tension Pneuthorax, Diabetic Ketoacidosis • Emergency Resuscitation of above medical emergencies • Preparation of different trays like emergency drugs tray, venesection tray, intubation tray, suturing tray, dressing tray • Common investigations like X-Rays, ECG, USG, CT-Scan etc. with relevant indication • Medico legal record maintenance & consent. • Anaphylactic shock management • Post exposure prophylaxis • **Overview of** Diabetes, jaundice, Hypertension, Fever, TB, AIDS, Anaemia, RESPIRATORY Diseases		
4	**Unit-4: OBGY:** • History taking & clinical examination in OBGY (General & local examination) • Antenatal Care & labour management • Bleeding P.V., Leucorrhoea • Common emergencies in OBGY Like PPH, APH , Eclampsia • Emergency Resuscitation of above emergencies • Infection control • Biomedical waste management	**15**	**16**
5	**Unit-5: Orthopaedics:** • History taking, clinical examination in Ortho (General & local examination) • Bone fracture management, arthritis • Plaster & cast application	**15**	**16**
6	**Unit-6: Pediatric:** • History taking, clinical examination in Pediatric (general & systemic) • Overview of Diarrhea, Fever, Cough, Basic new born care • Common pediatric emergencies with emergency resuscitation	**15**	**16**
7	**Unit-7: Anesthesia:** • Overview of Anaesthesia • Machine & Circuit • Intubation set • CPR	**11**	**12**
	Total teaching hours for the academic year		**108**

Clinical laboratory: Pathology

Year: Second Year D.Voc

Teaching and Examination Scheme:

Teaching Scheme (Hrs./Week)			Examination Scheme					Total
			External		Internal			
L	T	P	Theory	Practical	Theory	*C.E.	Practical	
-	-	2	-	70	-	15	15	100

L-Lectures; T-Tutorial; P-Practical; C.E.-Continuous Evaluation

List of Practicals:

1. Microscopic examinations
2. Hematological staining
3. Cytology staining
4. Total cell count
5. Differential blood count - RBC, WBC
6. Cell counts of body fluids and biochemistry
7. Semen analysis
8. Basic histological techniques
9. BT, CT, PT, APTT, INR etc
10. Electrophoresis

Clinical laboratory: Pharmacology

Year: Second Year D.Voc

Teaching and Examination Scheme:

Teaching Scheme (Hrs./Week)			Examination Scheme					Total
			External		Internal			
L	T	P	Theory	Practical	Theory	*C.E.	Practical	
-	-	2	-	70	-	15	15	100

L-Lectures; T-Tutorial; P-Practical; C.E.-Continuous Evaluation

List of Practicals:

1. Definition , sources of drugs and drug development
2. Clinical pharmacy introduction
3. Solid dosage forms
4. Liquid dosage forms – oral
5. Liquid dosage forms – parenteral
6. Liquid dosage form of topical formulations
7. Liquid dosage form of semi solid formulations
8. Dosage calculation
9. Sources of drug information
10. Communication with patients
11. Introduction to experimental pharmacology
12. Adverse drug reaction reporting

Clinical laboratory: Microbiology

Year: Second Year D.Voc

Teaching and Examination Scheme:

Teaching Scheme (Hrs./Week)			Examination Scheme					Total
			External		Internal			
L	T	P	Theory	Practical	Theory	*C.E.	Practical	
-	-	2	-	70	-	15	15	100

L-Lectures; T-Tutorial; P-Practical; C.E.-Continuous Evaluation

List of Practicals:

1. Simple staining techniques
2. Gram positive staining
3. Gram negative staining
4. ZN staining
5. Preparation of culture media
6. Methods of isolation
7. Instruments used in microbiology including sterilization equipments
8. Hanging drop preparation
9. Isolation and identification of fungi on SDA agar media
10. Use of U.V in Germicidal activity
11. Serological testing
12. Culture and drug sensitivity of blood, CSF, body fluids, etc.

SKILL MODULE 1- ADVANCE ECG & BASIC ECG

Type of Course: UG- D.voc Med. Sci.
Total duration of Skill Module: 80 hrs in Year 2nd Diploma Cardiology
Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					TOTAL
LectHrs/ Tut Hrs/	Week	ClinHrs/ Week		External		Internal			
				T	P	T	CE	P	
2	-	1		70	-	15	15	-	100

Lecture, Tut - Tutorial, Clin. - Clinical, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

Contents

Sr. No	Topics	Weightage	Teaching Hours
1	**1.Basic Electrocardiography (ECG)** • Fundamental principles of electrocardiography - Cardiac electrical field generation during activation - Cardiac electrical field generation during ventricular recovery - Leads and their position - Standard limb leads - Precordial leads and the Wilson central terminal - Augmented limb leads - The hexaxial reference frame and electrical axis - Recording adult and pediatric ECGs - Normal electrocardiogram-explaining PQRST - Normal timings - Heart rate calculations - Sinus tachycardia - Sinus bradycardia - Sinus arrhythmia- Removal of leads **2. Advanced Electrocardiography (ECG)** • Interpretation of and ECG strip - Steps involved - ECG abnormalities - Atrial arrhythmias - Left atrial abnormality - Right atrial abnormality - Ventricular arrhythmias - 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 - Repolarization (ST-T wave) abnormalities - Evolution of electrocardiographic changes - Non-infarction	100%	80

	Q waves - Primary and seconday T wave change - Electrolyte and metabolic ECG abnormalities - Cardiac arrhythmias - Premature atrial contraction - Supra-ventricular tachycardias - Atrial flutter/fibrillation - Junctional rhythm - Accelerated junctional rhythm - Ventricular premature beats - Ventricular Tachycardia/Ventricular fibrillation - Torsedes de pointes - Idioventricular rhythm - Accelerated idioventricular rhythm - Atrio Ventricular block - First degree - Second degree- Mobitz type 1 and 2 block - Complete heart block - A technologist's role in ECG interpretation - Maintenance and Care of the ECG Machine.		
	Total teaching hours for the academic year	**100%**	**80**

SKILL MODULE 2- BASIC CARDIOVASCULAR INVESTIGATIONS

Type of Course: UG- D.voc Med. Sci.
Total duration of Skill Module: 60 hrs in Year 2nd Diploma Cardiology
Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					TOTAL
LectHrs/ Tut Hrs/	Week	Lab Hrs/ Week		External		Internal			
				T	P	T	CE	P	
1	--	1		70	-	15	15	-	100

Lect- Lecture, Tut - Tutorial, Clin. - Clinical, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

Contents

Sr. No	Topics	Weightage%	Teaching Hours
1	**GENERAL:** 1. Recording a 12 lead ECG and a rhythm strip 2. Steps in interpretation of an ECG 3. Identification of various abnormal ECG rhythms 4. Identification of various atrial & ventricular arrhythmias. 5. Maintenance and care of ECG machines. 6. Conducting a Holter test 7. Interpretation of a Holter test 8. Conducting a Tread Mill test 9. Spotting cardiac arrhythmias and conduction abnormalities. **1.Holter** • Introduction to the Holter test - Indications for a holter test - Precautions to be taken during holter testing - Principles of Holter Recording - Connections of the Holter recorder - Holter Analysis - Guidelines for ambulatory electrocardiography - Procedure for a Holter test. **2.Treadmill Exercise Stress Testing** • History Taking- Exercise physiology - Exercise protocols - Lead systems - Patient preparation - ST segment displacement – types and measurement - Non-electrocardiographic observations - Exercise test indications, contra-indications and precautions- Recognition of patient risk factors associated with exercise tolerance - Cardiac arrhythmias and conduction disturbances during stress testing - Emergencies in the stress testing laboratory- Care of equipment (Set up	100	60

	&calibration , identification of associated work load measurements such as MET and aerobic impairment) - Absolute indicators to cancel or discontinue the test – Recognition of results (positive, negative, false positive, and false negative results)		
	Total teaching hours for the academic year	**100**	**60**

SKILL MODULE -3 MEDICAL ELECTRONICS, BIOPHYSICS & NUCLEAR CARDIOLOGY

Type of Course: UG- D.voc. Med. Sci.
Total duration of Skill Module: 90 hrs in Year 2nd Diploma Cardiology
Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					TOTAL
LectHrs/ Tut Hrs/	Week	Lab Hrs/ Week		External		Internal			
				T	P	T	CE	P	
1	--	2		70	-	15	15	-	100

Lect- Lecture, Tut - Tutorial, Clin. - Clinical, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

Contents

Sr. No	Topics	Weightage%	Teaching Hours
1	**1.Medical Electronics, Biophysics** • Introduction to hemodynamic monitoring - concepts of hemodynamic monitoring **-** Hemodynamic monitors - Blood pressure recording - Pulse oximetry - End tidal carbondioxide monitoring - Ventilators - introduction to ventilators - indications for use - modes of ventilation - Medical ultrasound and Doppler - Electrocardiographic processing and display system - Direct Current (DC) shock - Definition of a defibrillator - Indications Defibrillator use and procedure - types - Monophasic and biphasic shock - Technique of cardioversion - Indications for cardioversion - Measures to reduce radiation exposure **2.Introduction to Nuclear Cardiology** • Radiopharmaceuticals - Patient preparation - Myocardial perfusion imaging - First pass cardiac study - Radionuclide ventriculography - multiple gated acquisitions (MUGA) scans – Contraindications **3.General principle of hospital practice** • Hospital structure and organization, Care of Patient , Basic Assessment Skills, First aid & Basic Life Support, Maintenance of Hygiene & Infection Control Practices, Principles of asepsis, Maintenance of Medications in the department, Specialized Investigations - Care of Patients, Medico - Legal Issues	**100**	**90**
	Total teaching hours for the academic year	**100**	**90**

SKILL MODULE 4- CARDIAC CATHETERIZATION & IMAGING PHYSICS

Type of Course: UG- D.voc. Med. Sci
Total duration of Skill Module: 60 hrs in Year 2nd Diploma Cardiology
Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					TOTAL
LectHrs/ Tut Hrs/	Week	ClinHrs/ Week		External		Internal			
				T	P	T	CE	P	
2	-	1		100	-	50	50	-	200

Lect- Lecture, Tut - Tutorial, Clin. - Clinical, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

Contents

SR. NO	TOPICS	WEIGHTAGE	TEACHING HOURS
1	1.**Introduction To Cardiac Catheterization** • Equipments And Catheters - Catheter Cleaning And Packing - Setting Up The Cardiac Catheterization Laboratory For A Diagnostic Study - Table Movement - Angioscope - X-Ray Generating System - Image Intensifier - C-Arm - Contrast Pressure Injector - Hemoximeter - Mingograf - Transducer - Manifold - Pressure Line- Sheath - Percutaneous Transluminal Coronary Angioplasty – Indications, Contraindications, Instruments, & Procedure Guidelines. Percutaneous Transvenous Mitral Commisurrotomy – Indications, Contraindications, Instruments & Procedure Guidelines. Post Cardiac Catheterization Management. Coronary Angiography - Coronary Angiographic Catheters - Angiographic Views In Coronary Angiography - Left Ventriculography – Catheters, Views, Use Of The Injector - Atrial Septal Defect – Oximetry, Pressure Data, Device Closure Procedure - Ventricular Septal Defect -Device Closure Procedure - Patent Ductus Arteriosus -Device Closure Procedure - Shunt Calculations. Introduction To Pacemakers - Definition - Pacemaker Indicatons - Modes - Types - Parts Of A Pacemaker - Permanent Pacemaker – Indications, Contraindications, Procedure. **2.Introduction To Imaging Physics** • Types And Working Principle - Fluoroscopy - Angiography	**100%**	**60**

	And Cine Radiography - Conventional And Digital Radiography - Ultrasound - Mammography - Computed Tomography - Magnetic Resonance Imaging		
	Total teaching hours for the academic year	**100**	**60**

SKILL MODULE- 5 CARDIAC EMERGENCIES & CLINICAL EXAMINATION

Type of Course: UG- D.voc. Med. Sci.
Total duration of Skill Module: 20 hrs in Year 2nd Diploma Cardiology
Teaching and Examination Scheme:

Teaching Scheme			Credit	Examination Scheme					TOTAL
LectHrs/ Tut Hrs/	Week	ClinHrs/ Week		External		Internal			
				T	P	T	CE	P	
1	-	1	-	30	-	10	10	-	50

Lect- Lecture, Tut - Tutorial, Clin. - Clinical, T - Theory, P - Practical, CE - CE, T - Theory, P – Practical

Contents

SR. NO	TOPICS	WEIGHTAGE	TEACHING HOURS
1	**1.Cardiac Emergencies:** • Heart attack • Cardiac arrest • Chest Pain • Heart failure • Pericarditis And Cardiac Temponade • Massive Pulmonary Embolism • Myocardial Ischemia • Acute Pericarditis, etc **2. Clinical Examination** • Vital Signs • Hemostasis • Cardiac Output • Multiparametric Approach • Fluid Responsiveness • Basic life support • Advanced cardiac life support (BLS & ACLS), • Introduction to Cath lab • Interventional procedures • Diagnostic procedures • Administration of oxygen, Endo tracheal intubations, tracheotomy tube insertion, suctions procedure etc. • X-ray • ECG findings in acute cardiac emergencies.	100%	20
	Total teaching hours for the academic year	100%	20