STATEBOARDOFALLIEDMEDICAL SCIENCES,ODISHA

B.Sc. EMERGENCY MEDICALTECHNOLOGY (BEMT)

Preface: EmergencymedicineTechnologyhelpstodiagnoseandpreventdiseasethroughclinical laboratory tests. It is complementary to medical science. It involves analysis of bodymattersuchasfluid,tissue,andblood.Italsocoversmicro-organismscreening,chemicalanalyses,andcell count.

Emergency medicine Technologists are an integral part of the medical profession. Theseprofessionals get involved in practical and technical work to aid correct diagnosis andeffectivefunctioning ofBiochemical Laboratories.

Withadequateknowledgeandexperience,EmergencyMedicineLaboratoryTechnologistshaving B.Sc. EMT qualification can work in supervisory or management positions in laboratoriesand hospitals. They can also work as Laboratory Manager/Consultant/supervisor, health careAdministrator,HospitalOutreachcoordination,laboratoryinformationsystemAnalyst/Consultant, educational consultant/coordinator etc. Additional opportunities are availableinmoleculardiagnostics,molecularbiotechnologycompaniesandinvitrofertilizationlaboratoriesaswell as inresearch labs.

Programme:B.Sc. in Emergencymedicine technology

Duration: Three years (Six semesters) full-time programme with 6 months internship in thelastsemester.

Eligibility:+2 Sciencewith Physics,Chemistry&Biologyorequivalent degree

Examination: Examination rules will be as per guideline of State Allied Board. Government ofOdisha.

Internship: A candidate will have to undergo internship for a period of six calendar months in ahospital/Diagnostics Centre equipped with modern pathology laboratory facility or in a fullyequippedpathologylaboratory,whichfulfils thenorms decided bythe University.

Dissertationwillbecompulsorytoallstudents.Studentswillcarryoutdissertationworkindividuallyorin thegroupofnotmorethanthreestudents.Theformatfordissertation/Internship report will be similar to the research thesis style; incorporating chapterson: Introduction, Materials and Methods, Results and Discussion and References / Bibliography.Thedissertation will besubmittedin atypewrittenand boundform.

PlanofClasses&ExaminationPatternforDegree course

- Totaldurationofeachcourseis3years(6Semesters).
- Eachsemesteris of6monthsduration.
- In each semester the classes will be of 5months duration & internal assessmentwillbeconducted inthelast month of eachsemesterexcept 3rd&6thsemester .
- Universityexamination will beconducted at theendof 3rd&6th Semester.
- Ineachsemester,theclasseswillbeof500hoursincludingtheoryandpractical/clinical.
- **Distribution of classes**: There will be 5 hours of classes / day for 5 days in aweek,25 hours /week, 100 hours/month and 500hours in eachsemester.
- Of the 500 hours of classes, 200 hours will be dedicated for the theory classes;rest300 hours will bepractical / clinical.
- **Attendance in Class:** A Student will be eligible to appear in the semester anduniversity examination if he/she has attended minimum75% theory classes and85%practical classes.

EXAMINATION PATTERN

- **Internal assessment:** Internal assessment will be conducted in the last monthofeachsemesterexcept3rd&6thsemester(wheretherewillbeUniversityexamination.)
- **MarkDistribution:**50markspereachsubject(30Theoryand20practical/clinical).Minimumqualifyingmark:50%ineachtheoryandpractical/clinical.
- **QuestionPatternforTheory(SemesterExamination):**
  i. Shortquestionsof2marks eachX5 =10
  ii. Multiplechoicequestion1mark eachX 5=5
  iii. Fillintheblanks1markeachX5 =5
  iv. Matchthe following1mark eachX 5 =5
  v. LongQuestion (Choice) 1 X5 =5
- **University Examination:** Candidate has to pass two university examinationstobe conducted attheend of 3rdSemester &6th Semester, of 100 marks/Paper. A student will be eligible to appear in the university examination ifhe/she has secured 50% in internal assessment doneat the end of1st, 2nd, 4th&5thsemester.
- **University Examination.** A student will be eligible to appear in the university examination
- if he/she has secured 50% in each internal assessment (both Theory and Practical) done at the end of semester.
- Each Paper is of 100 marks (Theory -50, Practical-30, Internal Assessment-20). The duration of the examination is 2hours.
- **Question Pattern for Theory (University Examination):**
- i. Short questions of 2 marks each X 5 = 10
- ii. Multiple choice question1 mark each X 5 = 5
- iii. Fill in the blanks 1mark each X 5 = 5
- iv. Match the following 1 mark each X 5 = 5
- v. Long Question (Choice) 1 X 5 = 5

Degree: Onsuccessfulcompletionofthreeyearsprogramme,thecandidatewillbeawardedwith

"Bachelorof Sciencein EmergencyMedicineTechnology(B.Sc.-EMT)".

BACHELOROFSCIENCEINEMERGENCYMEDICINETECHNOLOGY

	FIRSTSEMESTER		
	Sl. No.	**Subject**	**Teaching hrs Theory &Practical/lab duty**
		Foundation Course	50
PAPER I	1	GeneralAnatomy	60+40
	2	GeneralPhysiology	60+40
	3	Biochemistry	60+40
SECOND SEMESTER			
PAPERII	4	Microbiology	60+40
	5	Pharmacology	60+40
	6	Clinical Pathology	60+40
		MedicalTerminology&Recordkeeping(including anatomicalterm)	40
		Medical Laboratory Management	60+40
	THIRD SEMESTER		
PAPER III	7	BasicprinciplesofHospitalmanagement	60+40
	8	Introductiontoemergencyservices-PartI	60+40
	9	EmergencyDepartmentEquipmentPart–I	60+40
	10	EmergencyDepartmentPharmacologyPart-I	60+40
	11	BasicComputerandInformationScience	40
	FOURTH SEMESTER		
PAPER IV	12	Introductiontoemergencyservices-PartII	60+100
	13	Emergencydepartmentequipment-PartII	60+100
	14	EmergencyDepartmentPharmacology-PartII	60+100
	15	Biostatistics and Research Methodology	30
	16	MedicalPsychology	30
		FIFTH SEMESTER	
PAPERV	17	Medicalemergencies -PartI	60+200
	18	Trauma,Burns and Electrocution	60+100
	19	Pediatric Emergencies	60+100
		SIXTH SEMESTER	
	20	IntroductiontoQualityandPatient Safety	30
PAPER VI	21	Medicalemergencies-PartII	60+100
	22	Surgical Emergencies	60+100
	23	Psychiatric,Geriatric&ObstetricEmergencies	60+100
	PROJECT		
	INTERNSHIP		

Courses: The-Theory,Prac-Practicals, ,Proj-Project

Basic computersand informationScience	Communicationandsoftskills	Introduction to Quality andPatient safety (including Basicemergencycareandlife support skills, Infection prevention andcontrol,	Medical Terminologyand Record keeping(including anatomicalterms)
Disastermanagement andAntibioticresistance)	Professionalism and values	Biostatistics & introduction toResearchmethodology	MedicalLawand ethics Biostatistics

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FOUNDATIONCOURSE

GENERALANATOMY

Description

- General anatomy deals with the entire human anatomy with emphasis on different tissues,bloodvessels, glands,nerves andthe entirecentralnervous system inparticular.

Learningoutcome

Atthe end ofthesemester, thestudent should beable to:

1. Comprehendthenormaldisposition,inter-relationships,gross,functionalandappliedanatomyof various structures in thehuman body.

2. Identify the microscopicstructuresofvarioustissues,andorgansinthehumanbodyandcorrelatethe structurewith thefunctions.

3. Comprehend the basic structure and connections between the various parts of the centralnervous system so as to analyze the integrative and regulative functions on the organs andsystems.

Module-1INTRODUCTIONTOANATOMYANDSKELETON

Introduction to Anatomy: Sub division of anatomy, terms and terminology, systems of the Body.Skeleton: Bones: function of bones, classification of bones, parts of young bone, development ofbone,classification ofbones, blood supplybone,cartilage, clinicalanatomy

Module–2MUSCLES&JOINTS

Muscle: types of muscles, structure of striated muscle, naming of muscle, fascicular architectureofmuscle, actions of muscle, nervesupply.
Joints:Classification,structuresofjoints,movements,mechanismoflubrication,biomechanics,levers, blood supply, nervesupply,and appliedanatomy.

Practice:- Identification ofdifferentjointsandbonesfromChartsandHumanSkeleton

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Module-3CIRCULATORYSYSTEM,LYMPHATICSYSTEM;SKIN

Circulatorysystem:Typesofcirculationofblood,arteries,veins,capillaries,endarteries,appliedaspect. Lymphatic system: components, lymph nodes, clinical anatomySkin:structureofskin,superficialfacia,deepfacia,clinical aspects**Module-4 UPPER LIMB& LOWER LIMB**

(A) **Upperextremity**:BonyarchitectureJoints–structure,rangeofmovementMuscles–origininsertion,actions,nervesupplyMajornerves–course,branchesandimplicationsofnerveinjuries Development of limb bones, muscles and anomalies Radiographic identification of boneand jointsApplied anatomy

(B) **Lower extremity**: Bony architecture Joints – structure, range of movement Muscles – origin,insertion,actions,nervesupply Major nerves–course,branchesandimplicationsof nerveinjuries Development of limb bones, muscles and anomalies Radiographic identification of boneand jointsApplied anatomy

Module-5THORAX,ABDOMEN&;BACKMUSCLES

Thorax: skeleton of thorax, intercostal spaces, pleura, lung, mediastinum, heart: morphology, bloodsupply,interiorofheart,generalinformationaboutupperrespiratorytract(trachea, oesophagus,pharynxandlarynx) clinical anatomy.

Abdomen: Anterior and posterior abdominal wall, general information about viscera: stomach,liver,pancreas, duodenum, kidney,ureter, urinarybladder,uterusand itsadnexa.

Practice: -identification of structure, position, and different parts of Lungs, Heart, Kidney fromcharts,Models.

Back muscles: Superficial layer, Deep muscles of back, their origin, insertion, action and nervesupply. Vertebral column – Structure & Development, Structure & Joints of vertebraThoracic cage. Radiographic identification ofboneand joints Applied anatomy

Practice: - Radiography identification of different architecture joins, structure and position ofBonesfrom Skeleton, Model orPPT.

Module-6NERVOUSSYSTEM;SPECIALSENSEORGANS

Nervous system: parts of nervous system, neurons, peripheral nerves, spinal nerves, summary of cranialnerves, parasympathetic nervous system.

Specialsenseorgans:StructureandfunctionofVisualsystem,auditorysystem,gustatory system, olfactorysystem.

Module-7 HEADANDNECK; CENTRAL NERVOUSSYSTEM

Headandneck:scalp,facialmuscles,cranialskeleton,trianglesofneck,parotidregion,temporomandibularjoint, muscles of mastication,applied.

Centralnervoussystem:Generalideaaboutspinalcord,brainstem,cerebrum,cerebellum,ventricularsystem,diencephalon,bloodsupplyofbrainanditsapplied,meningesandcerebrospinalfluid.

Practice:-Identification ofstructureanddifferent partsofCentralnervoussystemfrom chart. Identificationofdifferent blood supplyin brain from PPT.

Demonstrationofdissectedparts(upperextremity,lowerextremity,thoracic&abdominalviscera,faceand brain).

Recommended books:

1. Ross and Wilson: Anatomy and Physiology in Health and illness
2. Understanding Human Anatomy and Physiology, William Davis (p) MC Graw Hill
3. Essentials of Human Embryology. Bhatnagar, Orient Blackswan Pvt. Ltd.
4. Anatomy for B.Sc Nursing by Renu Chauhan. Arichal publishing company 2012
5. Hand book of Anatomy BD Chaurasia
6. Basics in Human Anatomy for B.Sc. Paramedical Courses 1st edition 2008 Jaypee Publishers

Reference books:

1. B D Chaurasia: Regional Anatomy. Vol I, II, III 6th edition

GeneralPhysiology
CourseOutline

Module-I

Scope of physiology. Definition of various terms used in physiology. Structure of cell, the function of its components with special reference to mitochondria and microsomes. Elementary tissues: Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connective tissue, andnervous tissue.

Module-II

Cardiovascular System: Composition of the blood, functions of blood elements. Blood group andcoagulation of blood. Brief information regarding disorders of the blood. Heart: myocardium–innervations– transmission of cardiac impulse- Events during the cardiac cycle–cardiac output.Structureand functions of various parts oftheheart.

Module-III

Circulation:Generalprinciples,Peripheralcirculation:peripheralresistances–arterialbloodpressure–measurements–factors, Regulation variations–capillary circulation–venous circulation.Special circulation: coronary cerebral–miscellaneous, Arterial and venous system with specialreferencetothenamesandpositionsofmainarteriesandveins.Briefinformationaboutcardiovascular disorders.

Module-IV

Respiratory system: Various parts of the respiratory system and their functions, physiology ofrespiration. Mechanics of respiration–pulmonary function tests–transport of respiratory gases-neuraland chemical regulationofrespiration–hypoxia, cyanosis,dyspnoea–asphyxia.

Module-V

Urinary System: Various parts of the urinary system and their functions, structure, and functionsof the kidney, the structure of nephron– mechanism of urine formation, composition of the urineandabnormalconstituents, urinarybladder &micturition. Pathophysiologyofrenaldiseasesandedema.

Module-VI

Digestive System: names of various parts of the digestive system and their functions. structureand functions of the liver, physiology of digestion- functions, and regulations of Salivarydigestion, Gastric pancreatic digestion, Intestinal digestion, and absorption.Lymphatic system:Name and functions of lymph glands, Reticuloendothelial system: Spleen, lymphatic tissue,Thymus

Module-VII

Nervous System: Neuron–Conduction of impulse– synapse–receptor. Sensory organization– pathways and perception, Reflexes–the cerebral cortex– functions. Thalamus–Basal gangliaCerebellum, the hypothalamus. Autonomic nervous system– motor control of movementsReproductive system. Structure and function of Male reproductive system–control & regulation,Femalereproductivesystem–uterus–ovaries–menstrualcycle–regulation– pregnancy&delivery–
breast–familyplanning

Practice:

1. Identificationofdifferentorgansandsystemsfrom charts
2. Identificationofdifferentbloodcells,theirnormalandabnormalmorphologyfromslides .
3. Examinationofpulse,B.P.,Respiratoryrate.
4. Reflexes
5. Spirometryto measurevarious lungcapacities& volumes,Respiratoryrate,Tidalvolume,IRV,IC
6. ERV,EC,residualvolumeonSpirometry.
7. AnestimateofHemoglobin,R.B.C.,W.B.C.,TLC,DLC,ESRcount.
8. Bloodindices,Bloodgrouping,Bleeding&Clottingtime

Recommend Books

1. A.K.Jain, Human Physiology and Biochemistry for physical therapy and occupational Therapy, 1st edition Arya publication.
2. Dr. Venkatesh .D and Dr. Sudhakar H.S.Basic of medical physiology, 2nd edition, Wolter-Kluwer publication.
3. Chaudhari (Sujith K) Concise Medical Physiology 6th Ed. New Central Book.

Reference Books

1. A.K.Jain, Text book of Physiology for medical students, 4th edition Arya publiction.
2. Guyton (Arthur) Text Book of Physiology.11th Ed. Prism publishers.
3. Ganong (William F) Review of Medical Physiology. 23rd Ed . Appleton.

Biochemistry

Objective

- Tounderstandtheconceptofmetabolismofcarbohydrates
- Tounderstand thesignificanceofamino acids,proteins
- Useofenzymesin enhancingmetabolicreactions
- Role oflipids

Learningoutcome

- Aftercompletion ofthecoursethe student willbedevelopedaverygoodunderstandingof various biomolecules which arerequired fordevelopmentandfunctioningof cells.
- Wouldhaveunderstoodthe significanceof carbohydratesin energygeneration andasstoragefood molecules forcells.
- Theywouldhaveunderstoodthesignificanceofproteinsandenzymesinaccele ratingvarious metabolicactivities.
- Theconceptual understandingof thesubject provides opportunities forskill enhancementandscopesforhigher education.

Course Outline

Module-1

Chemistry of Cell & Chemistry of Carbohydrates, Proteins, Lipids &Nucleotides-

Cell- Structure & Function of Cell Membrane, Subcellular Organelles and theirFunctions.
Carbohydrates- Definition, Classification & Biological importance of carbohydrates, Derivatives of Monosaccharides.
Proteins- Definition & Classification of amino acids & Proteins, Biologically important peptides Plasma proteins, Immunoglobulins.
Lipids- Definition, Classification & Biological importance and Functions of Lipids. Structure and functions of Cholesterol, types and functions of Lipoproteins.

Nucleotides- Structure and Functions of DNA & RNA. Biologically important nucleotides.

Module **II-12hrs**

Enzymes & Acid base balance

Enzymes- Definition and Classification. Factors affecting enzyme activity. Coenzymes and Cofactors. Enzyme inhibition & Regulation of enzyme activity

Acid Base balance- Acids, Bases & Body Buffers, Regulation of pH, Acid base disorders.

Module III- 12hrs

Vitamins & Minerals

Vitamins-Classification, Sources, RDA, Functions(in brief), deficiency manifestations and hypervitaminosis.

Minerals- Classification, Sources, RDA, Functions (in Brief), deficiency manifestations of the following: calcium, phosphorous, iron, copper, iodine, zinc, fluoride, magnesium, selenium, sodium, potassium and chloride.

Module IV- 12hrs

Nutrition, Blood chemistry & Urine Chemistry

Nutrition- Nutrients, Calorific value of food, BMR, SDA, respiratory quotient and its applications, Balanced diet based on age, sex and activity, biological value of proteins, nitrogen balance, Protein energy malnutrition, Total parenteral nutrition, dietary fibers.

Blood chemistry- Biochemical components & their reference ranges in normal & diseased states.

Urine chemistry- Biochemical components & their reference ranges in normal & diseased states

Module V- 12hrs

Clinical Biochemistry-

Specimen Collection- Blood,Urine and Body fluids.

Preanalytical, analytical and postanalytical errors

Clinical Biochemistry- Parameters to diagnose Diabetes & Cardiovascular diseases. Diagnostic enzymology, Assessment of arterial Blood gas status and electrolyte balance, Point of Care Testing. Renal Function tests(in brief), Liver function tests(in brief), Biomedical Waste Management.

Practicals

1. General Reactions of Carbohydrates.
2. Color reactions of Proteins.
3. Reactions of Non Protein nitrogenous substances.
4. Demonstration of pH meter, Colorimeter and spectrophotometer.
5. Demonstration of Chromatography and Electrophoresis.

Recommended books Recent edition

1. Textbook of Biochemistry -D.M.Vasudevan
2. Biochemistry -Pankaja Naik
3. Clinical Biochemistry-Principles and Practice-Praful.B.Godkar
4. Textbook of Biochemistry-Chatterjea and Shinde
5. Textbook of Clinical Chemistry-Norbert W Teitz

Reference Books Recent Edition

1. Harpers Biochemistry
2. Clinical Biochemistry-Michael L.Bishop
3. Textbook of Biochemistry-Rafi M.D
4. Lippincott's Illustrated review of Biochemistry
5. Practical Clinical Biochemistry-Harold Varley

Microbiology

Objective

- ToknowvariousCulturemediaandtheirapplicationsandalsounderstand variousphysicaland chemical means of sterilization
- ToknowGeneralbacteriologyandmicrobial techniquesforisolationofpurecultures ofbacteria, fungi and virus
- To master aseptic techniques and be able to perform routine culture handling tasks safelyand effectively

Learningoutcome

- Thisstudydemonstratesthetheoryandpracticalskillsinmicroscopyandtheirhandlingtechniquesand stainingprocedures.
- Understandingthedetailsof microbialcellorganelles.
- Providesknowledgeongrowthofmicroorganism.
- ProvidesknowledgeCulturingmicroorganism.

Course

OutlineModule

-1

Microbiology:Definition,history,host-microberelationship,andsafetymeasuresinamicrobiology laboratory. Morphology of bacterial cell wall, Bacterial anatomy (Bacterial cellstructure: including spores, flagella, pili and capsules). Sporulation. Classification of bacteriaaccording to cell wall and shape (arrangement), Classification of micro-organisms.Growth andNutritionofMicrobes**:**Generalnutritionalrequirementsofbacteria,Bacterialgrowthcurve

Practice:

1. Handlingof Microscope
2. TolearntechniquesforInoculationofbacteriaonculturemedia.
3. Toisolatespecificbacteriafrom amixtureoforganisms.

Module-2

Sterilization: Definition, sterilization by dry heat, moist heat (below, at & above 100ºC),Autoclave, Hot air oven, Radiation and Filtration, preventive measures, controls and sterilizationindicators.Useoflaminar flow in sterilization.

AntisepticsandDisinfectants:Definition,types,properties,modeofactionanduseofdisinfectantsand antiseptics, efficiencytestingofdisinfectants.

Practice:

1. Todemonstratesimplestaining(Methyleneblue)

2. Bacterial identification: To demonstrate reagent preparation and procedure forGram stain,Z-N staining, Capsule staining, Demonstration of flagella by staining methods, Sporestaining,To demonstratespirochetes byFontanastainingprocedure

Module-3

Staining techniques: Methods of smear preparation, Gram stain, AFB stain, Albert's stain andspecial staining for spore, capsule and flagella, Culture Media, Liquid and solid media, definedand synthetic media, routine laboratory media (basal, enriched, selective, enrichment, indicator,andtransportmedia).DifferentCulture,mediatheir preparationandusesinmicrobialgrowth.

Practice:

1. Biochemicaltestsforidentificationofbacteria
2. Preservationofstockculturesofbacteria
   Antibioticsusceptibility test

3.Demonstration of common serological tests: Widal, VDRL, ASLO, CRP, RF, Rapid tests for HIV, Hbsag and HCV.

3. Principles and practice of Biomedical waste management

Reference Books

1. Anathanarayana&Panikar: Medical Microbiology - Revised 8th Edition University Press.
2. Parasitology by Chatterjee - Interpretation to Clinical medicine.
3. Textbook of microbiology- Baveja, 5th edition, Arya publications
4. Textbook for laboratory technicians by RamnikSood. Jaypee publishers
5. Textbook of parasitology by Paniker. 7th edition

Pharmacology

Module IGeneralPharmacology ANS, PNS.

Sources of Drugs
Route of drug administration
Pharmacokinetics (Absorption, Metabolism, Distribution, Excretion)
Pharmacodynamics (Mechanisms of action)
Adverse drug reactions

ANS : ADRENERGIC drugs -Adrenaline, Noradrenaline, Ephidrine, Dopamine,

Dobutamine
Anti adrenergic-Phentolamine, Phenoxybenzamine, Prazocin, Tamsulosin,
Propranolol, Atenolol, Carvidelol
Cholinergic drugs-Acetyl choline, Pilocarpine, Neostigmine, Organophosphorous compounds
Anti cholinergic agents-Atropine, Glycopyrrolate, Ipratropium Bromide,
Dicyclomine

Module II PNS,CVS, Renal system

Skeletal muscle relaxants-D Tubocurarine, Succinyl choline, Diazepam, Dantroline
Local anaesthetics-lignocaine,la+vasoconstrictor
CVS-ionotropic agents -Digoxin,
Antianginal drugs-GTN,
Antihypertensives- Betablockers (Propranolol, Atenolol, carvidelol) ,CCBs (Nifedeine), Diuretics(Thiazide, Furesemide, ,ace inhibitors, ARBs, Clonidine

Drugs used in treatment of different types of shock, Plasma expanders
Renal system-Diuretics Furosemide, Thiazide, Spiranolactone
Antidiuretics-Vasopressin

Module III CNS,Blood
CNS-general Anaesthetics-nitrous oxide, Halothane, iv anaesthetics
Sedative hypnotics-diazepam,barbiturates,zolpidem
Antiepileptics-Phenytoin,carbamezapine,phenobarbitone,valproate
Opioid analgesics-morphine,pethidine ,codiene
NSAIDS-Aspirin, Diclofenacibuprofen, Selective COX2 inhibitors
Respiratory system-treatment of cough And Bronchial asthma
Blood-Hematinics, Anticoagulants -Warfarin, Heparin
Thrombolytics & Antiplatelet drugs-streptokinase,/ aspirin, clopidogrel

Module IVGIT,Chemotherapy
GIT-drugs used in peptic ulcer-ppi,H2 blockers, Antacids
Antiemetics -Metaclopromide, Domperidone, Ondensetron
Purgatives & Laxatives-bran, ispaghula, Lactulose, Bisacodyl &senna
Drugs used in Diarrhoea- ORS, Super ORS, Antimotility
drugs(loperamide,diphenoxylate)
Chemotherapy-general considerations MOA,Resistance,Prophylaxis
Sulfonamides, cotrimoxazoles,Quinolones
Tetracyclines,chloramphenicol
Betalactam antibiotics
Module VChemotherapy, Hormones.
Aminoglycosides
Macrolides,other antibiotics(vancomycin,linezolid) & treatment of UTI
Antifungal(clotrimazole,flucanozole)
Antiviral (Acyclovir, Few drugs used inHAART,)
Cancer chemotherapy
(names, common Adverse effects, general principles in the treatment of cancer)
Hormones-Corticosteroids its uses and adverse effects,
Treatment of Diabetes mellitus(insulin, Metformin, Glibenclamide)

Practicals Syllabus
Dosage forms
Solid Dosage forms
Liquid Dosage forms
Gaseous Dosage forms
Oral route
Parentral routes
Novel routes
Fixed dose combination-Amoxycillin+clavulinic acid-cotrimoxazole,
Lignocaine+Adrenaline
Drug stations-Adrenaline, dopamine, Dobutamine)
Drug stations-Corticosteroids(hydrocortisone, prednisalone, inhaltional steroids)
Drug stations-common antibiotics (amoxycillin, ciprofloxacin, Azithromycin,
Metronidazole, Cephalosporins)
Drug stations-Insulin preparations
Instrument & devices(Nasogastric tube, laryngoscope, Different Cathetors,
nebulizers, Inhalers, Rotahalers)

Recommended Books

1. K.d. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post Box, 7193, G-16, Emca House, 23/23, Bansari Road, Daryaganj, New Delhi.
2. Padmaja Udaykumar -Pharmacology for Allied Sciences
3. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, Single Volume, M/s Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay - 400 034.

PATHOLOGY

Module I

Introduction& scope of pathology

Cell injury and Cellular adaptations- Normal cell, Cell injury- types, etiology, morphology, Cell death-autolysis, necrosis, apoptosis, Cellular adaptations- atrophy, hypertrophy, hyperplasia, metaplasia.

Inflammation-Introduction, acute inflammation-vascular events, cellular events, chemical mediators, chronic inflammation- general features, granulomatous inflammation, tuberculosis.

Healing and repair- Definition, different phases of healing, factors influencing wound healing, fracture healing.

Haemodynamic disorders-
Oedema,hypermia,congestion,haemorrhage,embolism,thrombosis,infarction.

Neoplasia- Defintion, nomenclature, features of benign and malignant tumors, Spread of tumors, Dysplasia, carcinoma in situ, precancerous lesions.

Environmental and nutritional pathology- smoking, radiation injury, malnutrition, obesity, vitamin deficiencies

Module **II**

Haematological Disorders

Introduction and Haematopoiesis

Anaemia- introduction and classification(morphological and etiological), iron deficiency anemia: distribution of body iron, iron absorption, causes of iron deficiency , lab findings, megaloblastic anamia: causes ,labfindings, Haemolytic anemias: definition. Causes, classification and labfindings.

WBC disorders- quantitative disorders, leukemia-introduction and classification, acute leukemias, chronic leukemias. Bleeding disorders- introduction, physiology of hemostasis. Classification, causes of inherited and acquired bleeding disorders, thrombocytopenia DIC, laboratory findings.Pancytopenia.

Module III

Basic Hematological Techniques

Characteristics of good technician, Blood collection- methods (capillary blood, venipuncture, arterial puncture) complications, patient after care, anticoagulants, transport of the specimen, preservation, effects of storage, separation of serum and plasma, universal precautions, complete hemogram- CBC, peripheral smear, BT, CT,

PT, APTT, ESR, disposal of the waste in the laboratory.

ModuleIV

TransfusionMedicine

Selection of donor , blood grouping, Rh typing, cross matching, storage, transfusion transmitted diseases, transfusion reactions, components- types, indications.

Module V

ClinicalPathology

- Introduction to clinical pathology- collection, transport, preservation, and processing of various clinical specimens.

Urinalysis- collection. Preservatives, physical, chemical examination and microscopy, physical examination; volume, color, odor, appearance, specific gravity and ph, chemical examination; strip method- protein- heat and acetic acid test, sulfosalicylic acid method, reducing sugar- benedicts test, ketone bodies- rotheras test, bile pigments- fouchet method, bile salt- hays method, blood- benzidine test, urobilinogen and porphobilinogen- ehrlich aldehyde and schwartz test, bence jones protein., microscopy.

Examination of cerebrospinal fluid-physical examination , chemical examination, microscopic examination, examination of body fluids (pleural, pericardial and peritoneal), physical examination, chemical examination, microscopic examination, sputum examination.

Practicals:

organization-

Reception of specimen, dispatch of reports, records keeping, coding of cases.
Laboratory safety guidelines.
SI units and conventional units in hospital laboratory.
Haematology techniques
Basic requirements for hematology laboratory
Glasswares for hematology
Equipments for haematology.
Anticoagulant vials
Complete blood counts.
Determinations of haemoglobin.
RBC count and TLC by hemocytometer.
Differential leukocyte count.
Determination of platelet count
Determination of ESR and PCV.
Erythrocyte Indices- MCV, MCH, MCHC.
Reticulocyte count
Absolute eosinophilic count
Morphology of blood cells

Urinanalysis

Examination of cerebrospinal fluid

Examination of body fluids (pleural, pericardial, peritoneal)
Sputum examination.

1.Recommended Books Recent Editions.

1. Basic pathology Robbins Saunders, an imprint of Elsevier Inc.,Philadelphia,

USA.
2. Text book of pathology Harsha mohan jaypee brothers, new delhi.
3. Practical pathology P. Chakraborthy, Gargi Chakarborty New Central book agency, Kolkata.
4. Text book of Haematology Dr Tejinder singh Arya publications, sirmour (H P)
5. Text book of Medical Laboratory Technology Praful Godkar Bhalani publications house, Mumbai.
6. Textbook of medical Laboratory Technology Ramanik sood
7. Practical Haematology Sir John Dacie Churchill Livingstone, London.
8. Todd and Sanford, clinical diagnosis and management by Laboratory
9. Methodsjohn Bernard Henry All India Traveller Bookseller.
10. Histopathology Techniques, Culling.
11. Histopathology Techniques Bancroft
12. Diagnostic Cytopathology Koss
13. Diagnostic Cytopathology Winfred grey
14. Hand book of Medical laboratory Technology CMC Vellore
15. Basic Haematological Techniques Manipal.

MedicalTerminologyandRecordkeeping(includinganatomicalTerms)

This course introduces the elements of medical terminology. Emphasis is placed on buildingfamiliaritywithmedicalwordsthroughknowledgeofroots,prefixes,andsuffixes.Topicsinclude: origin, word building, abbreviations and symbols, terminology related to the humananatomy, reading medical orders and reports, and terminology specific to the student's field ofstudy.Spellingis critical and will becounted when grading tests

CourseOutline

1. Derivationofmedicalterms.
2. Definewordroots,prefixes,andsuffixes.
3. Conventionsforcombined morphemesandthe formationofplurals.
4. Basicmedicalterms.
5. Formmedicalterms utilizingroots, suffixes,prefixes, andcombiningroots.
6. Interpretbasicmedicalabbreviations/symbols.
7. Utilize diagnostic, surgical, and procedural terms and abbreviations related to theintegumentarysystem,musculoskeletalsystem,respiratorysystem,cardiovascular system, nervous system, and endocrinesystem.
8. Interpretmedicalorders/reports.
9. Dataentryandmanagementonelectronichealthrecord system.

MedicalLaboratoryManagement

Objective

- Explainand applyprinciple ofeffectivetest utilization
- Interpret,implementandcomplyinglaw,regulation,accreditingstandardsandguideline sofGovt. andNGorganizations.
- Design,implementand evaluateresourcesinlab

- Communicateeffectivelywithlaboratorypersonneland healthcareprofessional.
- Explainand applythe major principleand tactics oflaboratoryadministration.

Learningoutcome

- Becomeprofessionalcompetentinmedicallaboratory
- Exhibitasenseofcommitmenttothe ethicalandhumanaspectofpatient care
- Recognizetheroleofclinicallaboratoryscientistintheassuranceofqualityhealthcare
- Applicationofsafetyandgovernmentalregulationandstandardsasappliedtomedicallabo ratorypractice.

Course

OutlineModule

-I

Ethics of pathological clinics, Code of conduct for medical laboratory personal, Safety measurein the laboratory, Organization of Pathology laboratory under board of quality control, Clinicallaboratory science, Functional components of the clinical laboratory, A Standardized clinicallaboratory set up, Various types of laboratories, PPE in labs, Important instruction to minimizeinfectionin laboratoryworkers

Practice:PPEPractice,LabSetup,Samplecollectionandpreservation.

Module-2

Releaseoflaboratory reports,Clinicalalerts,Reportingresults:Basicformatofpathologyreports, Transportation and preservation of lab sample, Patient management for clinical samplecollection,Nationalandinternationalagencyforclinicallaboratoryaccreditation,Good laboratorypractice,Medicallegalproblems, Laboratoryregulation, Factorsaffectingproductivityoflaboratory, Responsibilityof lab worker.

Practice: Reportwriting,Labrecordmanagement

Module-3

Quality management system, NABL Policy, Clinical establishment act policy, Annual maintenance contactforlaboratory,Generalsafetyprecautions incaseofSTDanddrug resistanttuberculosis, Procurement and supply management, Different types of laboratory recordmanagement, Laboratory information management system (LIMS), Profit and loss analysis,WHOPolicyformedicallab

Practice: Managementinformationsystem,Procurementmanagement,Profitandlossanalysis

BasicPrinciplesofHospitalManagement

CourseObjects:

- ToimpartknowledgeaboutthePrinciplesofHospitalManagementandOrganization
- Tofamiliarizethestudentwiththeimportanceand differentfunctionsofManagement.
- Tolearnaboutthe conceptsofinventorycontrolandgetawarenessregardingtheNationalProgrammes of Health and diseaseeradication/control.

LearningOutcomes:

- The student acquires knowledge about the Principles of Hospital Management andOrganization.
- Thestudentunderstandstheimportanceand differentfunctionsof theManagement.
- Thestudent gets familiarizethoroughlywith theconcepts of inventorycontrolandgets awareness regarding the National Programmes of Health and diseaseeradication/control

ModuleI:Introductiontomanagement&Organization:
TheevolutionofManagement,DefinitionandimportanceofManagement.Planning–Organizing–staffing – Motivating –Leading – Controlling. Management of health care units(inbrief).
Module II: Individual behaviour in organization; organizational functioning (Group/Individual);Perception;Motivation MBO; Organizational Development.
ModuleIII:PlanningandManagementofHospitals&ClinicalServices:
Building and physical layout – space required for separate function – Planning of infrastructurefacilities,clinical services,equipment &Humanresources– Typesof Hospitals.

Module IV: Organization and administration of various clinical services; outpatient services. In-patientservices,emergencyservices,operationtheatres,ICU's andsuperspecialtyservices.

ModuleV:Organizingofsupportclinicalservices&Hospital management:
Imaging–CSSD–Laboratory–BloodBank–diet–MedicalRecords–Mortuary.Housekeeping – Maintenance (Water, Electricity, Civil, air Conditioning, Lift)-Pest Control-transport-Security. Forecasting-Purchasing&procurement(Sourcing,methodsandprocedures)

Module VI: Storing& issuing, Concept of inventory control, Maintenance of equipment andcontracts (with special reference to major biomedical equipment). Trends in financing of Healthand HospitalServices – Classification of Hospitals depending on source of financing – roles offinancialinstitutions.

ModuleVII: NationalProgrammesofHealthanddiseaseeradication/control

Health Programmes*:*

i. FamilyWelfareProgramme
ii. NationalProgrammeforwatersupplyand sanitation.
iii. NutritionalProgrammes.
iv. Immunizationanduniversalimmunizationprogramme.

DiseaseEradication programme: Leprosy&Guineaworm,poliomyelitis.

Disease control programmes: Tuberculosis, Malaria, Filaria, S.T.D, Goitre, Cholera and otherdiarrhoeal diseases and National Programme for prevention of blindness including trachoma,vectorbonedisease.

BasicComputerandInformationScience

Objective

- Identifythefunctionof computerhardwarecomponents.
- Identifythefactorsthatgointoanindividualororganizationaldecisiononhowtopurchase computer equipment.
- Identifyhowtomaintaincomputerequipmentandsolvecommonproblemsrelatingtocom puterhardware.
- Identifyhowsoftwareandhardwareworktogethertoperformcomputingtasksandhowsof twareis developed and upgraded
- Identifydifferenttypesofsoftware,generalconceptsrelatingtosoftwarecategories, andthetasksto whicheachtypeofsoftwareismostsuitedor notsuited.

Learningoutcome

- Understandthefundamentalhardwarecomponentsthatmakeupacomputer'shardwarean d therole of each of thesecomponents.
- **Understandthedifferencebetweenanoperatingsystemandanapplicationprogram ,and whateach isusedforina computer.**
- Describesomeexamplesofcomputersandstatetheeffectthattheuseofcomputertechnolo gyhas had on some common products

Course

OutlineModule

-I

Introduction to computer: introduction, characteristics of computer, block diagram of computer,generations of computer. Types of Input output devices. Processor and memory: The CentralProcessingUnit(CPU), main memory. StorageDevices.

Module-II

Introduction to MS-Word: introduction, components of a word window, creating, opening andinsertingfiles, editingadocument file,pagesettingandformatting thetext,savingthedocument,

spell checking, printing the document file, creating and editing of table, mail merge. Introductionto Excel: introduction, about worksheet, entering information, saving workbooks and formatting,printing the worksheet, creating graphs. Introduction to power-point: introduction, creating andmanipulatingpresentation, views, formattingandenhancingtext, slidewith graphs.

Module-III

Introduction to MS-DOS: History of DOS, features of MS-DOS, MS-DOS Commands (internalandexternal).Introductionofwindows:History,features,desktop,taskbar,iconsonthedesktop , operation with folder, creating shortcuts, operation with windows (opening, closing,moving, resizing, minimizing and maximizing, etc.). Computer networks: introduction, types ofnetwork (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree,hybrid).InternetanditsApplications:definition,briefhistory,basicservices(E-Mail,FileTransferProtocol,telnet,theWorld WideWeb(WWW)),wwwbrowsers, useoftheinternet.

Introductiontoemergencyservices-PartI

Module-I

1. Structureandorganizationofahospitalanditsdepartments
2. Functioningofanidealemergencymedicinedepartment
3. Conceptoftriage
   a) Componentsof triage
   b) Triageofficer
   c) Triageprocedure
4. Multipleandmasscasualties

a.Differencebetweenmultipleandmasscasualtiesb. Triage
c.Scenariosd.Equipment
e.Disasterpreparedness

Module-II

Ambulanceservices(A)

1. Preparationofanambulance

a. EQUIPMENT

I. Medical

1. Basicsupplies
2. Patienttransferequipment
3. Airways
4. Suctionequipment

5. Artificialventilationdevices
6. Oxygeninhalationequipment
7. Cardiaccompression equipment
8. Basicwoundcaresupplies
9. Splintingsupplies
10. Childbirthsupplies
11. Medications
12. Automatedexternaldefibrillator

II. Non-Medical

1. Personalsafetyequipmentasperlocal,state,andcentralstandards
2. Pre-planned routesorcomprehensivestreetmaps

b. PERSONNEL

1. Dailyinspections
   a) Inspectionofvehiclesystems
   b) Equipment
2. Utilizationofsafetyprecautionsand seatbelts

Module-III

Ambulanceservices(B)

1. Respondingto a call
2. Emergencyvehicleoperations
3. PositionandTransportofpatient:
   a. Patientposition,prone,lateral,dorsal,dorsalrecumbent,Fowler'spositions,comfortmeasures,bedmaking,rest and sleep.
   b. Liftingandtransportingpatients:liftingpatients upinthebed,transferringfrombedtowheel chair,transferringfrom bedtostretcher.
4. Loadingpatientstoanambulance
   a) Wheeledambulancestretcher
   b) Portableambulancestretcher
   c) Scoopstretcher
   d) Longspine board
5. Transferringpatients
6. Thephasesofanambulancecall
7. Disinfectionofambulancefollowingambulance usage
8. Airambulances

Module-IV

Prehospitalcare1.Introduction2.Vehicles

3.Communications

4.Patientrecord

5.Personalprotectiveequipment

6.Multiple/mass casualty-pre-hospital lifesupport

Module-V

Communication

1. Communicationwithdoctors,colleaguesandotherstaffs.
2. Non-verbalcommunication,Inter-personnelrelationships.
3. Patientcontacttechniques,communicationwithpatientsandtheirrelatives

Practicals:

PreparationofanambulanceProblemsbasedontriageBas
iclifesupport skills

Emergency Department Equipment Part - I

Module- I

Basic principle, description, types, usage, calibration and maintenance of:
1. Laryngoscopes
2. Endo-tracheal tubes (ETT), boogie
3. Ambu bag and mask

Module -II

Basic principle, description, types, usage, calibration and maintenance of:
1. Airway adjuncts, supra-glottic airway devices including Laryngeal mask airway (LMA)
2. Types of oxygen masks, venturi etc.
3. Oropharyngeal and nasopharyngeal airways (OPA and NPA)

Module - III

Basic principle, description, types, usage, calibration and maintenance of:
1. ICD tubes, bags, jars, instrument tray
2. Suction apparatus

Module - IV

Basic principle, description, types, usage, calibration and maintenance of:
1. Pulse oximeter
2. EtCO2 monitor

Module - V

Basic principle, description, types, usage, calibration and maintenance of:
1. Oxygen pipe-line and medical gas cylinders, pipelines and manifold
2. Ambulance (Cervical) Collar, Philadelphia Collar

Practicals:

Application/ connection to patient, usage, calibration, changing settings, demonstrating maintenance of equipment (5 marks x 8 equipment) 40 marks

Reference Books (latest edition)

1. Handbook of Emergency Care - Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

Emergency Department Pharmacology Part - I

Module - I

1. Preparation of injections and infusions
2. Dilution, reconstitution, infusion, bolus, setting rate of infusion, apparatus for infusion

Module - II

Routes of administration of medications, advantages, disadvantages, few common medications given by that route:

Ointments Subcutaneous
Creams Intra muscular
Drops: Eye and ear Intra venous
Intra nasal Intra arterial
Per oral Intra thecal
Sublingual Epidural
Intra dermal Rectal suppository
Trans dermal Vaginal pessary

Module - III

Indications for use, dosage, route and method of administration and adverse effects of drugs commonly used in the Emergency Department

INJ 25% and 50% Dextrose
IVF DNS
IVF NS
IVF RL
IVF 5% Dextrose
Anti-Tetanus immunization
Anti-Snake Venom
Anti-Rabies immunization
Lidocaine, Lidocaine +Adrenaline

Module - IV

Indications for use, dosage, route and method of administration and adverse effects of drugs commonly used in the Emergency Department

Diclofenac
Paracetamol
Fentanyl
Pethidine
Morphine
Pentazocine (Fortwin)
Tramadol
Dicyclomine
Hyoscine
Ketamine
Propofol
Thiopentone
Etomidate
Succinyl Choline
Vecuronium, Atracurium
Neostigmine
Glycopyrolate

Module - V 12 hrs
Indications for use, dosage, route and method of administration and adverse effects of drugs commonly used in the Emergency Department
Atropine
Adrenaline
Chlorpheniramine (Avil)
Frusemide (Lasix)
Adenosine
Noradrenaline
Vasopressin
Dopamine
Dobutamine
Labetalol
Nitroglycerine
Diltiazem
Amiodarone

Practicals:
Problems based on drug dosage calculation 10 marks
Demonstration of strategies to reduce medication error (Role-play) 10 marks
Preparation of IV injection/ infusion 20 marks

Reference Books (latest edition)
1. Handbook of Emergency Care - Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

Introduction to Emergency Services - Part II

Module - I
Principles of resuscitation
1. Sudden cardiac death
2. Cardiac, respiratory arrest
3. Basic cardiopulmonary resuscitation in adults
4. Advanced cardiac life support
5. Resuscitation in neonates
6. Resuscitation in paediatrics
7. Resuscitation in pregnancy
8. Ethical issues

Module - II
Specific resuscitative procedures
1. Airway management
2. Breathing and ventilation management
3. Venous and intraosseous access
4. Defibrillation and cardioversion
5. Fluid and blood resuscitation
6. Vasoactive agents in resuscitation
7. Arrhytmias
8. Emergency surgical procedures including cricothyroidotomy, needle thoracocentesis, ICD tube insertion, pericardiocentesis, and tourniquet application

Module - III

The emergency response team

Characteristics of team leader, roles of team members, closed loop communication, constructive criticism

Module- IV

Universal Precautions and Infection Control:

1. Hand washing and hygiene.
2. Injuries and Personal protection, Insulation and safety procedures.
3. Aseptic techniques, sterilization and disinfection.
4. Disinfection and Sterilization of devices and equipment
5. Central sterilization and supply department
6. Biomedical Medical waste management

Module- V 12 hrs

1. Documentation

The patient's medical record, charting, electronic medical records, hand-off at shift change and when transferring the patient

2. Medico legal aspects

Practicals:

Preparation of an ambulance 10 marks
Problems based on triage 10 marks
Basic life support skills 20 marks

Reference Books (latest edition)

1. Handbook of Emergency Care - Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

Emergency Department Equipment - Part II

Module- I

Basic principle, description, types, usage, calibration and maintenance of:

1. Electrocardiograph
2. Multi-parameter monitors

Module - II

Basic principle, description, types, usage, calibration and maintenance of:

1. Defibrillator, AED
2. Ventilator

Module - III

Basic principle, description, types, usage, calibration and maintenance of:

1. Crash cart
2. Trolleys and stretchers
3. Anesthesia work-station

Module - IV 1

Basic principle, description, types, usage, calibration and maintenance of:

1. Splints, Plaster Of Paris and immobilization devices
2. Dressing and procedure packs and materials
3. Foleys catheter
4. Nasogastric tube

Module - V
Basic principle, description, types, usage, calibration and maintenance of:
1. Point of care (POC) investigations including POC ultrasound, Bedside X ray, POC blood and urine investigations
Practicals: Emergency Department Equipment
Application/ connection to patient, usage, calibration, changing settings, demonstrating maintenance of equipment (5 marks x 8 equipment) 40 marks
Reference Books (latest edition)
1. Handbook of Emergency Care - Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

Emergency Department Pharmacology - Part II

Module - I

Review of prescription writing, parts of a prescription, abbreviations used and their interpretation
Module - II
Medication errors, look alike and sound alike drugs, strategies to reduce error
Module - III
Indications for use, dosage, route and method of administration, and adverse effects of drugs commonly used in the Emergency Department
Glyceryl Trinitrate
Sorbitrate
Aspirin
Clopidogrel
Atorvastatin
Pottasium Chloride
Sodium Bicorbonate
Calcium Gluconate
ORS Sachets
Module - IV
Indications for use, dosage, route and method of administration, and adverse effects of drugs commonly used in the Emergency Department:
Pralidoxime
Tranexamic Acid
Thiamine
Human Actrapid
Vit K
Octreotide
Protamine Sulphate
Heparin
Activated Charcoal
Deriphyllin
Salbutamol
Ipratropium
Budesonide
Hydrocortisone

Dexamethasone
Methylprednisolone

Module - V
Indications for use, dosage, route and method of administration, and adverse effects of drugs commonly used in the Emergency Department:
Pantoprazole
Ranitidine
Ondansetron
Metoclopramide
Phenytoin, Fosphenytoin
Phenobarbitone
Lorazepam, Diazepam, Midazolam
Mannitol
Oxytocin
Methyl Ergometrine
Magnesium Sulphate
Practicals: Emergency Department Pharmacology
Problems based on drug dosage calculation 10 marks
Demonstration of strategies to reduce medication error (Role-play) 10 marks
Preparation of IV injection/ infusion 20 marks
Reference Books (latest edition)
1. Handbook of Emergency Care - Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

Biostatistics and Research Methodology

Learning Objectives
1. To have a basic knowledge of biostatistics and its applications in medicine
2. To know various types of data presentation and data summarization in Medical field
3. To have overview of data analysis and sampling techniques
4. To understand various study designs in Medical field
5. To know applications of various study designs in Medical Research

Module I
Introduction and Presentation of data
Meaning, Branches of Statistics, Uses of statistics in medicine, Basic concepts, Scales of measurement, Collection of data, Presentation of data; Tabulation, Frequency Distribution, Diagrammatic and Graphical Representation of Data.

Module II
Measures of central tendency and Measures of Variation
Arithmetic Mean (Mean), Median, Mode, Partition values, Range, Interquartile range , Mean Deviation, Standard Deviation, Coefficient of Variation.

Module III
Probability and standard distributions
Definition of some terms commonly encountered in probability, Probability distributions; Binomial distribution, Poisson distribution, Normal distribution, Divergence from normality; Skewness and kurtosis

Module **IV**

Census and Sampling Methods

Census and sample survey, Common terms used in sampling theory, Non-probability (Non random) Sampling Methods; Convenience sampling, Consecutive Sampling, Quota sampling, Snowball sampling, Judgmental sampling or Purposive sampling, Volunteer sampling, Probability (Random) Sampling methods; Simple random sampling, Systematic Sampling, Stratified Sampling, Cluster sampling, Multi-stage sampling, Sampling error, Non-sampling error.

Module V Inferential statistics

Parameter and statistic, Estimation of parameters; Point estimation, Interval Estimation, Testing of hypothesis; Null and alternative hypotheses, Type-I and Type-II Errors.

Research Methodology

Module I -

Introduction to research methodology

Types of research; Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, Some Other Types of Research

Module II -

Study Designs-Observational Studies

Epidemiological study designs; Observational studies, Descriptive studies; Case reports, Case series, Analytical studies; Case control studies, Cohort studies, Cross sectional

Module III ExperimentalStudies

Experimental studies (Interventional studies); Randomized control Trials (Clinical trials), Field trials, Community trials, Nm-Randomized Trials

Module IV Uses of Epidemiology

Module V Applicationof study Designs in Medical Research

References

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2. NSN Rao and NS Murthy (2008), Applied Statistics in Health Sciences, Second Edition, Jaypee Brothers Medical Publishers (P) Ltd.
3. J.V.Dixit and L.B.Suryavanshi (1996), Principles and practice of biostatistics, First Edition, M/S Banarsidas Bhanot Publishers.
4. GetuDegu and Fasil Tessema (2005), Biostatistics, Ethiopia Public Health Training Initiative.
5. Essentials of Community Medicine for Allied Health Sciences, JSS University Publications, 20.
6. Park K. Park's Textbook of Preventive and Social Medicine. 23rd ed. Jabalpur: Banarsidas Bhanot Publishers, 2015. p.135-141.
7. Suryakantha. Textbook of Community medicine with recent advances. 4th edition.
8. Bhalwar R. Textbook of Public Health and Community Medicine.2nd Edition. Pune, Department of Community Medicine AFMC, 2012.
9. Leon Gordis. Epidemiology Fourth Edition - Elsevier Saunders Publication.

MedicalPsychology

Unit-I:
IntroductiontoPsychology;MeaningandDefinitionspsychology.Evolutionofmodernpsychology.ScopeofPsychology.Branchesofpsychology.Conceptofnormalityandabnormality.

Unit-II:
Identifying psychological disorders. Anxiety disorders (panic, phobia, OCD, PTSDSignssymptoms and management).

Unit-III.:
Stress,HansSelyeModelofstress.
LazarusandFolkmanmodelofstress.Sourcesofstress.Stress,diseaseandhealth. Changinghealth-impairingbehavior.

Unit-IV:

Learning;Meaning,definition,Theoriesoflearning.Pavlov'sclassicalconditioning.

Skinner'soperantconditioning.

Unit-V:

TherapeuticTechniques.Counselling-meaning anddefinition.Psychotherapy-meaning anddefinition. Relaxation- types. (Brief introduction to psychoanalytical, behavioural and cbttechniques)

Medicalemergencies-PartI

Module-I:

CardiovascularEmergencies

1. Approach to Chest pain-possible differential diagnosis, clinical assessment and pointofcareinvestigations in the emergencydepartment
2. Acute coronary syndrome-presenting symptoms, clinical assessment and point of careinvestigations in the field and emergency department, emergency management, ACLSprotocols
3. Acute decompensated heart failure - presenting symptoms, clinical assessment andpointofcareinvestigationsinthefieldandemergencydepartment,basicinitialmanagement
4. Bradyarrythmia-presentingsymptoms,clinicalassessmentandpointinvestigationsinthefieldandemergencydepartment, ACLSprotocols of Care
5. Tachyarrhytmia-presentingsymptoms,clinicalassessmentandpointinvestigationsinthefieldandemergencydepartment, ACLSprotocols of Care
6. Aorticdissection-presentingsymptoms,clinicalassessmentandpointinvestigationsinthefieldandemergencydepartment,basicinitialmanagement of Care
7. Deepveinthrombosis-presentingsymptoms,clinicalassessmentandpointofcareinvestigationsin

theemergencydepartment,basicinitial management

8. Pulmonarythromboembolism-presentingsymptoms,clinicalassessmentandpointofcareinvestigationsin thefieldand emergencydepartment,basic initialmanagement

Module-II:

PulmonaryEmergencies:Approachtothepatientwithbreathlessnessandpossibledifferentialdiagnosis;presentingsymptoms,clinicalassessmentandpointofcareinvestigationsin the emergencydepartment of

1. Respiratoryfailure
2. Upperairwayobstruction
3. Pneumothorax
4. Acuteasthma
5. Acuteexacerbation ofCOPD
6. Hemoptysis
7. Pleuraleffusionandempyema
8. Pneumonia

Module-III

FluidandElectrolyteDisturbances:Fluidcompartments;possiblecauses,presentingsymptoms, clinical assessment and point of care investigations in the field and emergencydepartment,basic initialmanagement of

1. Hypovolemia
2. Fluidoverloadstates
3. Hyperkalemia
4. Hypokalemia
5. Hypernatremia
6. Hyponatremia
7. Hypocalcemia

Module-IV:

1. NeurologicalEmergencies
2. Approachtotheunconscious patient
3. SeizuredisorderandStatusepilepticus-possiblecauses,presentingsymptoms,clinicalassessmentandpointofcareinvestigationsin thefieldandemergencydepartment,basic initialmanagement
4. Ischemicstroke-presentingsymptoms,clinicalassessmentandpointofcareinvestigationsin thefieldandemergencydepartment,ACLS protocol
5. Intracerebral hemorrhage-presenting symptoms, clinical assessment and point of careinvestigationsin thefieldandemergencydepartment,ACLS protocol
6. Meningoencephalitis-presentingsymptoms,clinicalassessmentandpointofcare investigationsinthefieldandemergencydepartment,basicinitialmanagement

Module-V:Shockandsepsis

1. Definitionandtypesofshock
2. Cardiogenicshock -possiblecauses, investigationsandemergencymanagement

3. Anaphylaxisandanaphylacticshock-possiblecauses,investigationsandemergencymanagement
4. Sepsis-presentingsymptoms,clinicalassessmentandpointofcareinvestigationsinthefield and emergencydepartment, basic initialmanagement

Practical:

1. MedicalEmergencies
2. Preparingan ambulance formedicalemergency
3. RespondingtoacallandscenemanagementofmedicalemergencyReceivingandresuscitatingapatientwithamedicalemergencyintheemergencydepartment

Trauma, Burns and Electrocution

Module- I: **12 hrs**

Hemorrhagic shock

1. Grading of hemorrhagic shock
2. Initial management
3. Blood transfusion - blood products, method of administration, precautions, identification and initial management of complications
4. Massive transfusion

Module- II:

Trauma (A)

1. Approach to the trauma victim - initial assessment, primary and secondary survey, ABCDE approach
2. Head injury - presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management
3. Thoracic Trauma - blunt and penetrating trauma, the open sucking chest wound, tension pneumothorax, cardiac tamponade, rib fractures, flail chest, pneumothorax, hemothorax, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management
4. Abdominal Trauma - blunt and penetrating trauma, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management

Module - III:

Trauma (B)

1. Spinal injury - spinal shock, neurogenic shock, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management
2. Extremity trauma - fracture, neurovascular injury, compartment syndrome, crush syndrome, immobilization and tourniquet, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management
3. Pediatric trauma - special considerations
4. Trauma in pregnancy - special considerations

Module- IV:

Burns

1. Type, depth and percentage of burns
2. Fluid resuscitation - Parkland formula, choice of fluid
3. Criteria for referral to burns center
4. Burns wound management in the ED

5. Escharotomy/ Fasciotomy
6. Medicolegal aspects

Module - V:
Electrocution
Presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management
Practicals: Trauma emergencies
Preparing an ambulance for trauma
Responding to a call and scene management of trauma
Receiving and resuscitating a patient with trauma in the emergency department

Reference Books (latest edition)
1. Handbook of Emergency Care - Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for Practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

Paediatric Emergencies

Module - I
Possible causes, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of
1. Stridor in children
2. Wheezing

Module- II
Possible causes, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of
1. Cyanosis in infants and neonates
2. Diphtheria
3. Pneumonia

ModuleIII
Possible causes, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of
1. Fever, febrile convulsions
2. Diarrhea and dehydration

Module IV
Possible causes, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of
1. Status asthmaticus in children
2. Status epilepticus in children

Module V
Possible causes, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of
1. Septic Shock in children
2. Child abuse

Practicals:

Airway management and resuscitation of an infant
Airway management and resuscitation of a child
Reference Books (latest edition)
6. Handbook of Emergency Care - Suresh David
7. Introduction to Clinical Emergency Medicine
8. Guide for practitioners in ED
9. Medicine Preparation Manual- George Mathew, KBI Churchil
10.Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

IntroductiontoQualityandPatientSafety

Objective

- Knowingpatientsafety
- ReportDistributionsystem
- Laboratoryinfection control Policy
- Bio-Medicalwastemanagement
- UnderstandingPatientrights
- ISO Policyformedical laboratory

Learningoutcome

- Knowaboutrightsand dutiesofpatient
- Knowaboutrightand dutiesoflabtechnician
- Understandvarious policyto managelab
- Understandinfectioncontrolprocedure

Course

OutlineModule

-I

HumanfactorEngineering,Patientsafety,Healthliteracy,Reportdistributionsystem, Errorinreportingsystem,respondingtoadverseevents,Investigationoferror/Rootcauseanalysis,Medical Error,Thescienceof safety

Practice: Safetyprecautioninlaboratory,Reportdistribution,Prescriptionreading

Module-II

Team work and communication, Leadership, Quality control policy, Major development andevaluation in diagnostic division, Clinical establishment act policy, National accreditation boardoflaboratory,ISOPolicyformedicallaboratory,Fireandsafetypolicyformedical laboratory

Practice: FireSafetyinlab, Documentation for Lab establishment

Module-III

Personal protective equipment in the laboratory, AIDS and laboratory safety, Safety protection

inlab in STD and other infectious disease., Biomedical waste management, Patient care in medicallaboratory,Patientrights.,Counsellingofpatientduringphlebotomy,Firstaidinmedicallaboratoryservice.

Practice:PPE,Bio-Medicalwastemanagement, First-Aid,PatientCounselling

MedicalEmergencies –II

Module-I:GastrointestinalEmergencies:

Presentingsymptoms,clinicalassessmentandpointofcareinvestigationsinthefieldandemergencydepartment, basic initial managementof

1. Acutegastroenteritis
2. UpperGIbleed
3. LowerGIBleed
4. Acutepancreatitis

Module-II:EndocrineandMetabolicEmergencies:

Presentingsymptoms,clinicalassessmentandpointofcareinvestigationsinthefieldandemergencydepartment, basic initial managementof

1. Hypoglycemia
2. Hyperosmolarhyperglycemicstate
3. Diabeticketoacidosis
4. Adrenalcrisis
5. Myxedemacoma
6. Thyroidstorm

Module-III:RenalEmergencies

Presentingsymptoms,clinicalassessmentandpointofcareinvestigationsinthefieldandemergencydepartment, basic initial managementof

1. Urinarytract infections
2. Acuterenalfailure
3. Acutepulmonaryedema in renalfailure

Module-IV:BitesandStings

Snakebites-commonIndianvenomoussnakes,presentingsymptoms,clinicalassessmentandpointofcareinvestigationsinthefield andemergencydepartment,basicinitialmanagement

1. Animalbites-dogbites,wildanimalbites,earlymanagementandrabiesprophylaxis
2. Bee,wasp,spider,scorpionandotherstings-initialmanagement

Module-V:OtherMedicalEmergencies

1. Fever -assessmentofthepatient,earlyidentificationofwarningsignsof sepsis,earlymanagement
2. Poisoninganddrugoverdose- Decontamination,common poisonsencountered,basicinitialmanagement
3. Purpura,Urticaria,Fixeddrugeruptions,Toxicepidermonecrolysis,StevenJoh nson'ssyndrome

Practicals:

- Preparingan ambulance formedicalemergency
- Respondingtoa callandscenemanagementofmedicalemergency
- Receiving and resuscitating a patient with a medical emergency in the emergencydepartment

SURGICAL EMERGENCIES

Module I

Abdominal Emergencies

Approach to pain abdomen and presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of

- 1. Peritonitis
- 2. Acute cholecystitis
- 3. Cholangitis
- 4. Hollow viscus perforation
- 5. Acute appendicitis
- 6. Intestinal obstruction
- 7. Peptic ulcer disease
- 8. Renal and ureteric calculi
- 9. Acute retention of urine
- 10. Paraphimosis

Module II

Skin and soft tissue infections

Presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of

- 1. Cellulitis
- 2. Nectrotising fascitis
- 3. Carbuncle
- 4. Abscesses
- 5. Gas gangrene

Module III

Emergencies of the Ear, Nose, and Throat

Presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of

- 1. Epistaxis
- 2. Foreign body in ear, nose, throat
- 3. Foreign body in trachea
- 4. Stridor for evaluation
- 5. Emergencycricothyroidotomy
- 6. Emergency tracheostomy

Module IV

Oral and Neck Emergencies

- 1. Gingivitis, dental caries, and dental abscesses - presenting symptoms, clinical
- assessment, basic initial management
- 2. Ludwig's angina - presenting symptoms, clinical assessment, basic initial
- Management

ModuleV

Ophthalmic Emergencies

- Presenting symptoms, clinical assessment, basic initial management of
- 1. Foreign body in the eye
- 2. Trauma to the eye
- 3. Eye infections
- 4. Red eye

Practicals: Surgical Emergencies

- Preparing an ambulance for patient with surgical emergencies
- Responding and communicating back to a hospital of a surgical patient
- Receiving and resuscitating a patient with surgical emergencies in the emergency
- department

Reference Books (latest edition)

- 1. Handbook of Emergency Care - Suresh David
- 2. Introduction to Clinical Emergency Medicine
- 3. Guide for practitioners in ED
- 4. Medicine Preparation Manual - George Mathew, KBI Churchil
- 5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

Psychiatric, Geriatric and Obstetric Emergencies

Module - I

1. Approach to the geriatric patient
2. Fall in elderly - presenting symptoms, clinical assessment, basic initial Management

Module - II

1. Acute mania,Anxiety and panic attacks - presenting symptoms, clinical assessment, basic initial management
2. Depression - presenting symptoms, clinical assessment, basic initial management
3. Restraints, pharmacological restraint and medico-legal issues of restraint

Module- III

1. Assessment of a pregnant patient
2. Conducting normal delivery
3. Emergency Caesarean section

Module - IV

Possible causes, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of

1. Antepartum hemorrhage
2. Post partum hemorrhage

Module - V

Possible causes, presenting symptoms, clinical assessment and point of care investigations in the field and emergency department, basic initial management of

1. Preeclampsia
2. Eclampsia
3. Ectopic pregnancy

Practicals:

Airway management and resuscitation of a pregnant woman
Responding to a frail elderly patient with fall at home

Reference Books (latest edition)

1. Handbook of Emergency Care - Suresh David
2. Introduction to Clinical Emergency Medicine
3. Guide for practitioners in ED
4. Medicine Preparation Manual- George Mathew, KBI Churchil
5. Fundamentals of Respiratory Care- Egan's - Craig l. Scanlon

MedicalLaw andEthics

Objective

- Thecourseprovidesanintroductiontoethicsgenerally andmorespecifically tomedical ethics, examining in particular the principle of autonomy, which informsmuch of medical law. The course then considers the general part of medical lawgoverning the legal relationship between medical practitioners and their patients. Itconsiders the legal implications of the provision of medical advice, diagnosis andtreatment. Selected medico-legal issues over a human life are also examined. Thesemay include reproductive technologies, foetal rights, research on human subjects,organdonation, the rightsof thedyingandthe legal definitionofdeath.

Learningoutcome

- Theethical underpinningsof thelawasit relatesto medicine,
- Thelawofnegligenceinthecontextof theprovisionofhealthcare,
- Legalandethicalissuessurroundingend andbeginningoflifedecisions,
- Themaintenanceofprofessional standardsinthehealthcareprofession,and
- Theroleofpolicyintheformation oflaw asit relatesto medicine.

Course

OutlineModule

-I

1. Medicalethics-Definition -Goal -Scope

2. IntroductiontoCodeofconduct

3. Basicprinciplesofmedicalethics –Confidentiality

Module-II

4. Malpracticeandnegligence -Rational andirrational drugtherapy

5. Autonomyand informedconsent-Rightof patients

6. Careof theterminallyill-Euthanasia

7. Organtransplantation

Module-III

8. Medico legal aspects of medical records – Medico legal case and type- Records and documentrelated to MLC - ownership of medical records - Confidentiality Privilege communication -Release of medical information - Unauthorized disclosure - retention of medical records - othervariousaspects.

9. Professional Indemnityinsurancepolicy

10. Developmentofstandardizedprotocoltoavoid nearmissorsentinelevents

11. Obtaininganinformedconsent

INTERNSHIP

For a period of 6 months in the department ofMedicine , Surgery ,O & G, ICU and Pediatricemergency

InternshipThesisGuideline

This Guideline is designed to provide students the knowledge and practice of public healthresearch activity, to enable them to carry out researches and solve research related problemsand to help them in writing thesis and defend their work. Upon successful completion of thecourse,the students shallbeable to:

1. Searchrelevantscientificliterature
2. Developaresearchproposal
3. Employappropriatedata collectiontechniquesandtools
4. Managecollecteddata
5. Analyzedatawithappropriatestatisticaltechniques
6. Writethesis
7. Defendthefindings

ProposalDevelopment:

Attheendingofthirdyear(SixthSemester),studentsindividuallyconsultationwithdesignated faculties and extensive literature survey will develop research proposal during theinitial6 months period.

DataCollection/ThesisWriting:

Studentswillcarryoutdatacollection,datamanagement,dataanalysis,andthesiswritingduringtherem ainingperiod (SixSemester).
TheDissertation shouldhavefollowingformat:

1. Title
2. Introduction
3. MaterialsandMethods
4. Results
5. Discussion
6. Conclusion
7. Recommendation
8. References
9. Appendix

Internship

1. Caserecord
2. Labmanagementandethics
3. Evaluation-Guide(internal)
    a. -Industriesguide(external)
    b. -University-projectreport/Viva

Project

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DRAFT