BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE

Faculty of Medical Sciences
B.Sc - Perfusion Technology
New Syllabus

BHARATI VIDYAPEETH

(Deemed to be University) Pune, India

MEDICAL COLLEGE, PUNE

PUNE –SATARA ROAD, PUNE – 411 043.

SYLLABUS

SEM I TO SEM VI

B. Sc (PERFUSION TECHNOLOGY)

and

ABILITY ENHANCEMENT

ELECTIVE COURSES

BHARATI VIDYAPEETH

MEDICAL COLLEGE PUNE, 411043

Under Faculty of Medical Science

(To be implemented from Academic Year 2021- 22)

DOCUMENT ON CONDUCT OF COURSE

PREAMBLE – BSc (PERFUSION TECHNOLOGY)

1. **Introduction**

Bharati Vidyapeeth Deemed University, Pune has developed the training programme for capacity building since we have 'State of Art' infrastructure, the necessary renowned, experienced and dedicated faculty. We are attached to a spacious well equipped tertiary care hospital and excellent clinical exposure.

Cardiovascular perfusion is the science of providing extracorporeal circulation in order to artificially support and temporarily replace a patient's respiratory and circulatory systems.

A perfusionist is a skilled allied health professional, trained and educated specifically as a member of an open-heart surgical team, responsible for the selection, setup and operation of a Heart-Lung Machine and other life support system like IABP, LVAD, RVAD & ECMO.

Additionally the perfusionist must be capable of handling stressful situations, pay great attention to detail, communicate effectively, and be willing to stay abreast of new developments in the profession. While most perfusionists are employed by medical centres but clinical perfusion often requires on-call responsibilities at night, on weekends and holidays also. Perfusionists also work in educational institutions as teachers and/or researchers. Further, some perfusionists are hired by industry that manufacture various perfusion related supplies and equipment.

It will help in overall development of technical and interpersonal skills required to work under the supervision of Cardiologists, CTVS surgeons and Anaesthetists.

2. **Aims and objectives**

a. To learn Basic Sciences including Anatomy and functions of various body parts and systems.
b. To learn Perfusion technology and cardiopulmonary bypass.
c. Introduction to skills of a perfusion technician and ability to assist in routine, emergency and complicated cases Blood bank including legal aspects.

3. **Eligibility**

a. Age – Completed 17 years of age at the time of admission.
b. Qualification – Candidate who has successfully passed the Higher Secondary Examination (10+2 Science) course with Physics, Chemistry and Biology and English with minimum 50% marks from recognised board is eligible for admission

4. **Selection Process:** On merit and interview,by board of doctors / nurses appointed by the Principal of the Bharati Vidyapeeth Deemed University Medical College

5. **Intake Capacity** – 10

6. **Course Duration** – 3 Years and one year of internship

7. **Course in brief**

   The course would be run by the Department of CTVS Bharati Vidyapeeth Deemed University Medical College. The candidates would be trained in the Department of Cardiology and CTVS. At the end of the every year it would be mandatory for the candidates to appear for written and practical examinations.

   Major Areas of Training

   - Basic anatomy of cardiac system, respiratory system, renal system and basic anatomy of other systems.
   - History and development of perfusion technology and cardiopulmonary bypass
   - Biochemical parameters and physiological details of cardiac system
   - Basic pathologic disorders related to the cardiac system
   - Common drugs used for cardiac conditions
   - History and working of a heart- lung machine.
   - Basics of perfusion technology
   - Recent advances of perfusion technology
   - Skills of a perfusion technician and ability to assist in routine, emergency and complicated cases

8. **Training Location** - Bharati Hospital and Research Centre, Pune

11. **Assessment:** Formative and Summative Assessment. 80% attendance is compulsory.

12. **Vicarious Responsibilities** - All relevant rules and regulations of the university and college in force at the time will be adhered to.

13. **Certification** – On completion of all necessary terms and conditions the successful candidates will be given a Degree certificate by Bharati Vidyapeeth Deemed University. Degree will be termed as “BSc in Perfusion Technology”

14. **Employment** – As there are few universities running this programme and there is lot of requirement of such technicians, they will be an asset to our institution and will find gainful employment institutes

15. **Others**: Accommodation will have to be arranged by students themselves.

SUBJECT-ANATOMY (AH101)

Learning Objectives:-

1) To give theoretical knowledge and its application, to undertake training in Anatomy.

2) To broaden the horizon of students by teaching them regarding various bones, joints, musculoskeletal system and loco motor system.

Syllabus is as follows :-

Unit I - Human Body as a whole

1. Define anatomy.
2. List the sub-divisions of anatomy.
3. Describe the Anatomical terms of location and position of various parts and organs in the human body
4. Fundamental planes of the body.
5. Enumerate the levels of organization of human body.
6. Structure of cell
7. Basic Tissues of the body - classification and preparation of tissue for observation under microscope – describe properties of various basic tissues of the body with examples – Epithelial tissue, connective tissue, muscular tissue, nervous tissue.
8. Microscope- Parts of microscope and functions
9.

Unit II - Loco motor System

Skeletal system:

1. Classify different types of bones.
2. Describe different parts of bone.
3. Understand blood supply of a long bone.
4. Identify major bones of the body and their parts
5. Classify different joints with examples.
6. Describe general features of a synovial joint.
7. Classification of different types of synovial joints with type of movements and examples.
8. Classify different types of muscles.
9. List the names of muscles as functional groups.
10. Describe important muscles in the body.- Trapezius, Deltoid, Pectoralis major, Gluteus maximus, Hamstring muscles, Soleus, sternocleidomastoid, oblique muscles of abdomen, muscles of tongue, scapular muscles
11. **Describe the following :**
    Axilla, cubital fossa, popliteal fossa, Triangles of neck, Flexor and

Extensor Retinaculum, Palmar and Plantar Apo neurosis

12. Describe Type, Sub type, Articular surface,Ligaments, Relations, Blood supply, Nerve supply, Movements and Clinical Anatomy of Shoulder joint, Elbow Joint, Wrist joint, 1st carpo-metacarpal joint, Hip Joint, Knee Joint, Ankle Joint

Unit III - Nervous System

1. Parts of nervous system.
2. Structure of nervous tissue.
3. Spinal cord - coverings, extent, general features, sub-divisions, structural organization of grey matter and white matter. Blood supply. Formation of tracts –Posterior column pathway, pyramidal tract and their clinical importance. Injuries to spinal cord.
4. Brain stem – components, Blood supply, important functional components and effect of their injury
5. Cerebellum – location, parts, functional subdivisions, connexions, blood supply and functional importance
6. Cerebrum – surfaces, poles, lobes, blood supply, sulci, gyri and important functional areas and their clinical importance. Thalamus, hypothalamus, basal ganglia, corpus striatum, hippocampus and amygdala – their location and function.
7. Cranial nerves – names, location of nucleus and the functional components
8. Spinal nerves – Course of a typical spinal nerve. Formation of plexuses – brachial, lumbar – important nerves of upper limb, lower limb.

Unit IV - Circulatory System

1. General plan of circulatory system.
2. Pulmonary, portal and systemic circulations.
3. Structure of cardiac muscle, blood vessels.
4. Thoracic cavity – Bony cage, muscles – intercostal muscles, diaphragm
5. Mediastinum – sub-divisions, contents
6. Heart - coverings, external features, chambers, blood supply, nerve supply.
7. Major arteries of upper limb, lower limb, head and neck, abdomen and pelvis.
8. Important veins – superior and inferior vena cava, portal vein, veins of upper limb and lower limb - varicose veins and their importance
9. Lymphatic system – components, Describe in brief anatomy and microscopic structure of lymphoid organs – lymphnode, tonsil, thymus, spleen, thoracic duct.

Unit V - Respiratory System

1. Parts of respiratory system.
2. Nasal cavity, paranasal air sinuses, nasal septum, lateral wall of nose.

3. Pharynx – extent, sub-divisions, muscles
4. Larynx – cartilages, muscles, parts, nerve supply
5. Trachea and bronchial tree – extent, measurements, histological structure of trachea – subdivisions of bronchial tree – broncho-pulmonary segments and their clinical importance
6. Pleura – types, reflections, recesses
7. Lung – location, relations, lobes, fissures, surfaces.

Unit VI - Digestive System

1. Abdomen – quadrants, musculature of wall, Formation inguinal canal, rectus sheath and their importance
2. Components of digestive system.
3. Mouth - Tongue, palate – Structure of tongue
4. Salivary glands – parotid, sub-mandibular – Brief anatomy and structure
5. Stomach – position, parts, blood supply, nerve supply, lymphatic drainage, relations, structure
6. Small intestine – sub-divisions, microscopic structure
7. Large intestine in general - sub-divisions, microscopic structure. Specific - caecum and appendix
8. Accessory organs of digestive system –Liver, pancreas, extra hepatic biliary apparatus - Gross features, relations, blood supply, microscopic structure.

Unit VII - Excretory and Reproductive Systems Learning objectives:

1. Excretory system – parts
2. Kidney – Gross anatomy and microscopic structure.
3. Ureter, urinary bladder and urethra – gross anatomy in brief.
4. Male reproductive system – parts – external genitalia – Testis and duct system in detail. Microscopic structure of testis.
5. Female reproductive system - parts – external genitalia – Ovaries and duct system in detail. Microscopic structure of Ovary and uterus.
6. Accessory organs of reproduction – prostate gland, mammary gland- gross anatomy and their structure

Unit VIII - Endocrine System

1. List the endocrine glands and their location
2. Thyroid and parathyroid glands – location, relations, blood supply, functions, clinical importance – Microscopic structure
3. Pituitary gland – location, parts, relations, blood supply, functions, clinical importance- Microscopic structure
4. Supra renal gland - location, parts, relations, blood supply, functions, clinical importance - Microscopic structure.

Syllabus (Practical)

- General Anatomy of cartilage, bone, joints, muscles and vessels
- Bones, muscles and joints of Upper limb
- Bones, muscles and joints of Lower limb
- Thorax - Bones of thorax, Mediastinum, Lungs and pleura, Heart and pericardium
- Abdomen – pelvis, organs of Alimentary system, excretory system, male and female reproductive System
- Vertebral column
- CNS – parts of brain with functions, cerebrum, cerebellum
- Histology – of basic tissues – epithelium, bone, cartilage, muscles, vessels
- Living anatomy and Bony landmarks
- Embryology – spermatogenesis, oogenesis, Fertilization, early development
- Introduction to Genetics

SUBJECT: MICROBIOLOGY (AH 201)

Learning Objectives:-

Students will be able to acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology.

Students will acquire and demonstrate competency in laboratory safety

Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing

Week No	Contents of Theory	Contents of Practical	Venue	Remark
Week No 01	1. Introduction & History of Microbiology. 2. Morphology of bacteria -I	1.Visit to Laboratory 2.Gram Staining	Department of Microbiology, Bharti Vidyapeeth Medical College	
Week No 02	1. Morphology of bacteria –II 2. Growth requirement of bacteria	1.Special Staining & ZN Staining 2.Motility		
Week No 03	1. Sterilization- I 2. Sterilization- II	1.Sterilization-I 2. Sterilization-II		
Week No 04	1. Antibiotic Classes & Their Action. 2. Various methods of sensitivity testing	1.ABST all methods		
Week No 05	1. Infection 2. Infection control	1.Systematic study –I 2.Systematic Study-II		
Week No 06	1. Immunity & Immunization schedule 2. Hypersensitivity-I	1.Serological reactions		
Week No 07	1. Hypersensitivity-II 2. Culture Media	1.Culture media 2.Infection Control		
Week No 08	1. Identification of bacteria 2. Respiratory Infection & meningitis	1.Respiratory infection & Meningitis 2.Enteric fever		

Week No 09	1.Enteric fever & UTI 2.Leprosy & TB	1.UTI 2.Leprosy TB		
Week No 10	1.SDT & Miscellaneous infections 2. Wound Infections & HAI	1.STD 2.Wound infection &HAI		
Week No 11	1.Mycology –I (Yeast) 2. Mycology-II (Moulds)	1.Mycology-I (yeast) 2.Mycology -		
Week No 12	1.Hepatitis, HIV 2.Dengue, Chikungunya, Influenza	1.Virology-I 2.Virology-II		
Week No 13	1.Polio, Rabies 2. introduction to parasitology	1.Protozoa 2.Helminths		
Week No 14	1.Entamoeba Histolytica, Malaria 2.T.solium, T.saginata, E.granulosus	1.Anaerobic Infections 2.Laboratory Animals		
Week No 15	1.Ascaris, Hookworm 2. Filaria	1.Quality Control In Microbiology		

SUBJECT: PATHOLOGY (AH 202)

Learning Objectives:-

Students should learn how to evaluate laboratory and pathologic testing, including pitfalls related to specimen collection, handling mythologies, and the skills of individuals performing those tests.

Greater knowledge about laboratory tests will not only enable testing to be used more effectively but will also allow more and better understanding of the nuances and interpretation of laboratory evaluations.

Understand the pathologic basis of disease for which a particular test is performed.

Understand the principles considered in test selection for screening, diagnosis treatment and monitoring of disease.

Syllabus is as follows :-

- Cell injury and adaptation
- Degeneration, Necrosis and Gangrene
- Hemodynamic disturbances
- Inflammation and healing
- Chronic inflammation
- Nutrional and Environment and mental diseases
- Neoplasia
- Hematology
- Heart & blood vessels
- Respiratory diseases
- GIT, Liver diseases
- Kidney disease
- Endocrine diseases
- Bone and joint diseases
- CNS diseases
- Revision

Syllabus Practical

- Collections of samples
- Necrosis and Gangrene
- Ischemia , Infarction
- Acute inflammation
- Chronic inflammation
- Inflammation and healing
- Neoplasia
- Anemia ,Leukemia
- CVS,Blood vessels
- Respiratory diseases
- GIT diseases
- Kidney diseases and urine
- Thyroid ,DM
- Bone and joints
- CNS diseases
- Revision

The pattern of practical's/demonstration in Pathology will be decided as per the topic given in the syllabus.

SUBJECT- PHYSIOLOGY (AH102)

Learning Objectives:-

1. To have an enhanced knowledge and appreciation of mammalian physiology;
2. To understand the basic functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems;
3. To understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail;
5. To be able to recognize and identify principal tissue structures.

S. No	Chapter	Topics
1	General Physiology	Concept of Homeostasis, Cell structure and function, Transport across cell membrane
2	Nerve Muscle Physiology	Action Potential, Structure and classification of nerves, N-M Junction, Muscle contraction and E-C coupling
3	Blood	Blood Composition and functions, Leucocyte structure and function, RBC- Structure, Function and Erythropoiesis, Platelet- Structure and Functions, Plasma Proteins and Immunity
4	Cardiovascular System	Functional anatomy and Nerve supply of heart, Origin and spread of cardiac impulse, Cardiac cycle, cardiac output, Heart rate, ECG
5	Respiratory System	Structure of Respiratory tract, Mechanism of Respiration, Regulation of respiration, Transport of Oxygen and Transport of CO2, Hypoxia and Cyanosis
6	Excretory System	Structure of nephron and blood supply, Formation of urine- Filtration, Formation of Urine- Reabsorption and secretion, Micturition reflex, Daily output of urine, Bladder abnormalities, Diuretics,
7	Skin	Sweat gland, Temperature regulation
8	Digestive system	Functions of saliva, Stomach- Structure, gastric glands, Functions of gastric juice, Pancreatic juice- Composition and function, Functions of bile, Deglutition and Motility
9	Nervous system	Synapse and synaptic transmission, Reflex and properties of reflex, Sensory ending and sensory mechanisms, Spinal cord pathways, Thalamus, Basal Ganglia and Parkinsonism, Cerebellum – Functions, Cerebrospinal fluid and Autonomic Nervous system

10	Special senses	Physiology of vision, Audition and Vestibular apparatus
11	Endocrine system	Anterior and posterior Pituitary gland hormone, Diabetes insipidus, Dwarfism, Gigantism, Acromegaly Thyroid hormone- Functions, Cretinism, Myxedema, Goiter and Grave's disease Parathyroid hormone- Functions, Tetany Insulin- Actions, Diabetes mellitus Adrenal cortical hormones
12	Reproductive system	Male reproductive organs, Spermatogenesis, Testosterone Female Reproductive organs- Menstrual cycle, Male and female contraceptive methods

Syllabus (Practical)

1. **Hematology:**
   Estimation of Hemoglobin, Determination of Bleeding time and Clotting time, Determination of Blood Groups, R.B.C. count, W.B.C. count, Demonstration of Differential W.B.C count, Demonstration of PCV and ESR

2. **Amphibian Graphs:**
   Cardiac Graphs and Skeletal muscle Graphs

3. **Human and Clinical Physiology:**
   Clinical examination of Arterial Pulse and Arterial Blood Pressure, Clinical examination of Cardiovascular System, Demonstration of ECG, Clinical examination of Respiratory system, Lung volume and capacities, Artificial Respiration, Clinical examination of Sensory system and Motor system, Tests of Hearing, Acuity of Vision and Colour vision, Study of Body Temperature

4. **Spots:** Relevant theory and practical topics

SUBJECT- BIOCHEMISTRY (AH103)

Learning Objectives:-

By the end of the course, the students should be able to demonstrate knowledge and understanding in the following core areas.
Aspects of protein structure
Enzyme kinetic behavior and mechanisms
Bioinformatics
Chromatin structure in relation to gene expression
Mechanism and control of DNA transcription in animals
DNA damage repair, and integrity, immortalization
Protein synthesis & translational control.
Molecular microbiology of infectious disease

Syllabus is as follows:-

1. **H+, Acids, Bases, Buffers :**

Equilibrium constant, dissociation of water, H+ concentration, pH, acids-strong and weak, bases, titration behavior, Henderson-Hesselbach equation, buffers, pH measurement, physiological buffers.

2. **Membrane and Cell:**

Organelles, functions, membrane structure, transport across membranes, ionophores, membrane proteins, transporters.

3. **Chemistry of Carbohydrates**:

Classification, important monosaccharides, stereoisomerism, anomerism. Reaction with acids, amines, oxidizing agents, reducing agents. Osazones, Disaccharides, polysaccharides.

4. **Chemistry of lipids:**

Definition, classification, nature of fatty acids, triacyl glycerol, saponification and iodine number, rancidity, antioxidants, complex lipids, steroids. energitics, Lipolysis.

5. **Chemistry of amino acids, peptides, proteins:**

Structure of 20 amino acids, grouping isomerism, charge properties, ninhydrin reaction, peptide bond, examples of peptides, Proteins –classification, Structure-primary, secondary, tertiary and quaternary forms, denaturation.

6. **Chemistry of Nucleic Acids including protein synthesis :**

History, bases, nucleosides, nucleotides. DNA and gene. Types of RNAs, Nucleotides coenzymes.

7. Haemoglobin :

Structure and functions of haemoglobin, Hb derivatives, degradation of Hb, Jaundice, Haemoglobinopathies

8. Enzymes:

History, catalyst, classification, efficiency, specificity, basic account of mechanism of action. Factors affecting enzyme activity. Units of measurement, Inhibitors – competitive, non- competitive, examples. Coenzymes, proenzymes, isoenzymes, Clinical enzymology, normal values.

9. Vitamins:

History, Vitamins A, D, E and K. B-complex vitamins – thiamine, riboflavin, niacin, pyridoxine, folic acid, pantothenic acid, biotin, B-12, Vitamin C. Brief account of chemistry, source, requirements, deficiency diseases, biochemical functions, Hypervitaminosis.

10.Mineral metabolism:

Bulk and trace elements. Sodium, potassium, Calcium, Phosphorous, Iron. Brief account of iodine, magnesium, copper, zinc, fluoride, manganese, selenium and molybdenum.

11.Energy Metabolism:

Calorimetry, basal metabolism, specific dynamic action, energy requirements under different conditions. Hormonal influence.

12.Nutrition:

Distribution of energy in dietary factors, Nitrogen balance, Protein quality, Kwashiorkar and Marasmus. Protein supplimentation, Recommended dietary allowance and diet planning.

13.Immunology :

BASICS : Innate & acquired immunity, humoral & cell mediated immunity, antigen & antibodies

Practical Examination Scheme for BSc Skill Development Course I year-I Semester

Question	Heading	Marks
Q.A	**Spots** **There will be total 5 spots of 2 marks each on following** a) Identification and use of common laboratory equipments and glassware: Ovens, incubators, refrigerators, deep fridge, centrifuges, water baths, water distillation apparatus, analytical balance, flasks, pipettes, cylinders funnels, tubes, thermometers, colorimeter, spectrophotometer, ELISA, Chemiluminesence. b) Identification and use of appropriate specimen collection containers.	**10 Marks**
Q.B	**Qualitative Experiment on** **Candidate has to Perform one of the following:** 1) Tests on Monosaccharides(Glucose and Fructose) 2) Tests on Disaccharides(Lactose and Sucrose) 3) Precipitation Reactions of Proteins 4) Normal Constituents of Urine 5) Abnormal Constituents of Urine	**20 Marks**
Q.C	**Quantitative Estimation:** **Candidate has to Perform one of the following:** 1) Estimation of Blood Glucose 2) Estimation of Blood Urea 3) Estimation of Serum Total Proteins and Albumin, Calculations of Albumin: Globulin Ratio 4) Estimation of Serum Creatinine, Urine Creatinine, and calculation of Creatinine Clearance 5) Estimation of Serum Bilirubin	**30 Marks**
	Total	**60 Marks**

SUBJECT: PHARMACOLOGY (AH 203)

Learning Objectives:-

The student will be able to identify a range of drugs used in medicine and discuss their mechanisms of action.

The student will be able to report the clinical applications, side effects and toxicities of drugs used in medicine.

Knowledge of the pathogenesis of diseases, interventions for effective treatment, and mechanisms of health maintenance to prevent disease

Subject : Pharmacology

Syllabus

Theory - Contents

S.No	Topic	No. of Hours
1	General Pharmacology	10
2	Autonomic Nervous System	4
3	Biogenic. amines & Autocoids	4
4	Kidney - Diuretics	2
5	Chemotherapy	6
6	Endocrinology	2
7	Miscellaneous drugs	2
Total Hours		**30**

Practicals

S.No	Topic	No. of Hours
1	Practicals	9
2	Drug display	27
3	Student - discussion	27
4	Record work & Model exams	5
Total Hours		**68**

Bharti Vidyapeeth
School of allied health Sciences
BSc Courses (Pharmacology – Syllabus)

Week No.	*Contents of theory*	*Contents of Practical*
	Routes/Dosage forms	Dosage forms ,Routes display
2	Pharmacokinetics	Bioavailability , Instruments
3	Pharmacodynamics	Student discussion
4	Adverse Drug Reactions	Spotters
5	ANS – Adrenergic (Emphasis on Anaphylaxis)	Drug Display Student Discussion
6	Cholinergic	Drug Display
7	Biogenic Amines – Histaminic & Antihistaminic	Student Discussion
8	Prostaglandins / NSAIDs	Drug Display
9	Contrast Media – Uses & ADRs	Drug Display
10	Chemotherapy – General Concepts	Student Discussion
11	Chemotherapy – Individual agents	Drug Display
12	Chemotherapy – Individual agents	Drug Display
13	Endo - Steroids	Student Discussion
14	Kidney - diuretics	Student Discussion
15	Chelating agents	Student Discussion

The pattern of practical's/demonstration in Pharmacology will be decided as per the topic given in the syllabus.

SUBJECT: COMMUNITY MEDICINE (AH 204)

LEARNING OBJECTIVES:

At the end of the course, the learner shall be :

1. Aware of the physical, social, psychological, economic, and environmental health determinants of health and disease.
2. Able to think epidemiologically, diagnose totally, treat comprehensively and be able to function as community and first contact physician.
3. Able to apply the clinical skills to recognize and manage common health problems including their physical, emotional and social aspects at the individual, family and community levels and deal with public health emergencies.
4. Able to identify, prioritize and manage the health problems of the community after making community diagnosis.
5. Able to perform as an effective leader of health team at primary care level.

BSc courses (Semester I/II)

Week No.	Mode of teaching- Lecture	No. Of hours	Mode of teaching- Small group (Practical)	No. Of hours
Week 01	Concept in Community Medicine	2	Introduction, Disinfection-I	4
Week 02	Mode of transmission of disease and methods of control	2	Disinfection-II	4
Week 03	Health services and Primary health center	2	Nutrition- I	4
Week 04	Nutritional Health	2	Nutrition- II	4
Week 05	Epidemiology of Communicable Diseases	2	Immunization	4
Week 06	Epidemiology of Communicable Diseases	2	Field visit-I	4
Week 07	Epidemiology of Non Communicable Diseases	2	Field visit-II	4
Week 08	Epidemiology of Non Communicable Diseases	2	Field visit-III	4
Week 09	National Health Programme	2	Family planning	4
Week 10	Disease Control Programme	2	Hospital waste management	4
Week 11	Demography and Population Control-I	2	Seminar-I	4
Week 12	Demography and Population Control-II	2	Seminar-II	4
Week 13	Environmental Sanitation	2	Water-I	4
Week 14	Revision and Feedback	2	Water-II	4
Week 15		2	Assignment Evaluation-I	4
Week 16			Assignment Evaluation-II	4
Week 17			Project Evaluation	4
Week 18			Vital statistics- Sources of Health Information	4
Week 19			Revision -I	4
Week 20			Revision -II	4
Total hours		28 hours		80 hours

SUBJECT ENGLISH (AH 104)

Learning Objectives:-

At the end of the course student will be able:-

a. to enable the learner to communicate effectively and appropriately in real life situation
b. to use English effectively for study purpose across the curriculum
c. to develop interest in and appreciation of Literature;
d. to develop and integrate the use of the four language skills i.e.

UNIT-1 PROSE

1. SECRET OF WORK ---- SWAMI VIVEKANANDA
2. PLAYING THE ENGLISH GENTLEMAN ----- M. K. GANDHI

UNIT-2 POETRY

1. ECOLOGY ----- A.K. RAMANUJAN
2. LA BELLE DAME SANS MERCI -------JOHN KEATS

UNIT – 3 SHORT STORY

1. THE BOY WHO BROKE THE BANK ------ RUSKIN BOND
2. LOTTERY TICKETS ------ ANTONCHEKOV
3. THE DEATH TRAP ----- SAKI (H.M. MUNRO)

UNIT -4 GRAMMAR

1. CORRECTION OF SENTENCES
2. MATCH THE ONE WORD SUBSTITUTE
3. LETTER WRITING
4. EXPANSION OF PROVERBS
5. PRECIS WRITING
6. COMPREHENSION OF PASSAGE

SUBJECT: ENVIRONMENTAL STUDIES (AEC 205)

Learning Objectives:-
Master core concepts and methods from ecological and physical sciences and their application in environmental problem solving.
Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.
Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.
Ability Enhancement Compulsory Courses (AECC – Environmental Studies)

Unit 1: Introduction to Environmental Studies
Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere.
Scope and importance; Concept of sustainability and sustainable development.
(2 Lectures)

Unit 2: Ecosystems
What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession. Case studies of the following ecosystems:
a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem
d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) (6 Lectures)

Unit 3: Natural Resources: Renewable and Non-renewable Resources
Land Resources and land use change; Land degradation, soil erosion and desertification.
Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
Heating of earth and circulation of air; air mass formation and precipitation.
Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.
(8 Lectures)

Unit 4: Biodiversity and Conservation
Levels of biological diversity :genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots
India as a mega-biodiversity nation; Endangered and endemic species of India
Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ

conservation of biodiversity.
Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.
(8 Lectures)

Unit 5: Environmental Pollution
Environmental pollution : types, causes, effects and controls; Air, water, soil, chemical and noise pollution
Nuclear hazards and human health risks
Solid waste management: Control measures of urban and industrial waste..
Pollution case studies. (8 Lectures)

Unit 6: Environmental Policies & Practices
Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.
Environment Laws : Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; International agreements; Montreal and Kyoto protocols and conservation on Biological Diversity (CBD). The Chemical Weapons Convention (CWC). Nature reserves, tribal population and rights, and human, wildlife conflicts in
Indian context (7 Lectures)

Unit 7: Human Communities and the Environment
Human population and growth: Impacts on environment, human health and welfares. Carbon foot-print.
Resettlement and rehabilitation of project affected persons; case studies.
Disaster management: floods, earthquakes, cyclones and landslides.
Environmental movements: Chipko, Silent valley, Bishnios of Rajasthan.
Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).
(6 Lectures)

Unit 8: Field work
Visit to an area to document environmental assets; river/forest/flora/fauna, etc.
Visit to a local polluted site – Urban/Rural/Industrial/Agricultural.
Study of common plants, insects, birds and basic principles of identification.
Study of simple ecosystems-pond, river, Delhi Ridge, etc.

SUBJECT-PRINCIPLES OF NURSING (AEC105)

Learning Objectives:-

1. To help individuals to attain independence in self-care. It necessitates development of compassion and understanding of human behavior among its practitioners to provide care with respect and dignity and protect the rights of individuals and groups.
2. A central goal of care is to promote, maintain, and restore the well-being and health of women, families, and communities. Accountability:
3. To learn principles of nursing keeping SMART in mind :- 'Specific' refers to who, what, when, where, and why. 'Measurable' means that you can actually measure and evaluate the progress of that goal in a concrete way. 'Action-oriented' means there are actions that can be taken to reach the goal. Reasonable means that they are helpful in patient care & welfare
   Timely means that care is provided in a timely manner to avoid complication & morbidities.

Unit I : Nursing & Nursing process:

Definition, concept of Nursing, History of Nursing, Nursing process, Problems solving approach, Assessment, Diagnosis, planning, Implementation and Evaluation.

Unit II : First aid and Nursing Emergencies:

Definition, basic principles, scope and rules.
Wounds, hemorrhages, shock, fracture, dislocation and muscle injuries, respiratory emergencies, resuscitation,unconsciousness,Miscellaneousconditions,burns,scalds,foreignbodiesintheskin, eyes, ear, nose, throat and stomach.Frost bite, effects of heat cramps, bites and stings. Poisoning. Transporting injured persons.

Unit III : Personal Hygiene and Health

Menstrual hygiene, clothing, mental health, common health problems of poor personal hygiene.

Unit IV : Comfort, Rest and Sleep

Unit V : Hospital Housekeeping

Unit VI : Health Education

Introduction to principles and methods of health education.Use

of audio visual aids, mass education, role of nurse in health education.

Clinical Practicals :

1. First Aid, CPR,(for pediatric and adult) Bandaging types.
2. Practiceofvariouscomfortdevices,variouspositionsinnursingfoundation lab.
3. Health talk, preparation of 3-5 types of A.V.Aids,
4. Ward visit to monitor BMWmanagement.
5. Assessment of Pulse, Respiration and Temperature (can be add)

Enrolment no	History of client	Communication	Identify the need	Skill	Implimentation	Evaluation	Viva	TOTAL
	(10)	(5)	5	(10)	10	(10)	10	60

COMMUNICATION SKILLS (CEC 106)

Learning Objectives:

1. Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. from multiple perspectives.

2. Students will be able to find, use, and evaluate primary academic writing associated with the communication discipline.

3. Students will develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others. Such skills could include communication competencies such as managing conflict, understanding small group processes, active listening, appropriate self-disclosure, etc. Students will be able to communicate effectively orally and in writing.

Syllabus is as follows:-

CS-1: ASPECTS OF COMMUNICATION

Unit-1: Communication: An Introduction

- Definition, Nature and Scope of Communication
- Importance and Purpose of Communication
- Process of Communication
- Types of Communication

Unit-2: Non-Verbal Communication

- Personal Appearance
- Gestures
- Postures
- Facial
- Expression
- Eye Contacts
- Body
- Language(Kinesics)
- Time language
- Silence
- Tips for Improving Non-Verbal Communication

Unit-3: Effective Communication

- Essentials of Effective Communication
- Communication Techniques
- Barriers to Communication

CS-2: VERBAL COMMUNICATION (ORAL-AURAL)

Unit-4: Listening Skills-I

- Purpose of Listening
- Listening to Conversation (Formal and Informal)
- Active Listening- an Effective Listening Skill
- Benefits of Effective Listening
- Barriers to Listening

Unit-5: **Listening Skills-II**

- Academic Listening (Listening to Lectures)
- Listening to Talks and Presentations

Unit-6: Oral Communication Skills (Speaking Skills)-I

- Importance of Spoken English

Unit-7: Oral Communication Skills-II (Communication in Context-I)

- Asking for and giving information
- Offering and responding to offers
- Requesting and responding to requests
- Congratulating people on their success
- Expressing condolences
- Asking questions and responding politely
- Apologizing and forgiving

Unit-8: Oral Communication Skills-III (Communication in Context-II)

- Giving instructions
- Seeking and giving permission

- Expressing opinions(likes and dislikes)
- Agreeing and disagreeing
- Demanding explanations
- Asking for and giving advice and suggestions
- Expressing sympathy

CS-3: VERBAL COMMUNICATION (WRITTEN)

Unit-9: Effective Writing Skills-I

- Elements of Effective Writing (What is writing?)
- The Sentence, Phrases and Clauses
- Types of Sentences

Unit-10: Effective Writing Skills-II

- Main Forms of Written Communication
- Paragraph Writing (Linkage and Cohesion)
- Letter Writing(formal and informal)
- Essay writing
- Notices

Unit-11: Effective Writing Skills-III

- Summarising
- Précis Writing
- Note-making

CS-4: COMMUNICATION AS A SKILL FOR CAREER BUILDING

Unit-12: Preparing for a Career

- Identifying job openings
- Applying for a job
- Preparing Cover letters
- Preparing a CV/Resume and Effective Profiling

Unit-13: Presentation Skills

- Preparing a PowerPoint Presentation
- Greeting and introducing
- Group Discussions
- Preparing for and Facing a Job Interview

Unit-14: Telephone Skills

- Basics of Telephone communication
- How to handle calls- telephone manners
- Leaving a message
- Greeting and Leave Taking over phone(etiquette)

Unit-15: Time & Stress Management

- Identifying Time Wasters
- Time Management Tips
- Identifying Factors Responsible for Stress
- Stress Management Tips
- Test Preparation Tips

Unit-16: Soft Skills for Leadership and Team Management

- Qualities of a Good Leader
- Leadership Styles
- Decision Making
- Intrapersonal skills
- Interpersonal skills
- Problem solving
- Critical thinking
- Negotiation skills

Unit-17: Practical Assignments:

- ORAL Communication
- Written Communication

Semester III
PERT 301- Applied *Pathology*

Theory

UNIT I

* Atherosclerosis-definition, risk factors, pathogenesis, morphology and complications
* Ischemic heart disease: Myocardial infarction- definition, pathogenesis, morphology and complications
* Hypertension- Benign and malignant hypertension: pathogenesis, pathology and complications

UNIT II

* Heart failure-Right and left heart failure: causes, pathophysiology and morphology
* Rheumatic heart disease and infectious endocarditis- definition, etiopathogenesis, morphology and complications
* Congenital heart disease- Types and atrial septal defect; aneurysms- types and morphology; cardiomyopathies in brief

UNIT III

* Atelectasis - types, Adult respiratory distress syndrome - causes , pathogenesis and morphology; pulmonary edema- classification, causes

and morphology

* Chronic obstructive pulmonary disease- Chronic bronchitis, emphysema, asthma, bronchiectasis: Definition, etiopathogenesis and morphology
* Restrictive pulmonary diseases- Definition, categories, pathogenesis and morphology

UNIT IV

* Pneumoconiosis-types, asbestosis, coal workers pneumoconiosis- etiopathogenesis and morphology
* Pulmonary embolism, infarction, pulmonary hypertension-Definition, etiopathogenesis and morphology
* Pneumonia-Classification of pneumonias; Lobar pneumonia and bronchopneumonia - etiology, pathology and complications

UNIT V

* Clinical manifestations of renal diseases
* Glomerular lesions in systemic diseases- diabetes, amyloidosis and systemic lupus erythematosus
* Pericardial and pleural effusions- causes and microscopy

Semester III
PERT 301- Applied *Pathology*

Practical

1. Urine examination: physical, chemical, microscopy
2. Blood grouping & Rh typing
3. Hemoglobin estimation, packed cell volume (PCV), erythrocyte sedimentation rate (ESR)
4. Charts
5. Specimens

   * Atherosclerosis
   * Pneumonia
   * Tuberculosis
   * Infarct - lung
   * Contracted kidney
   * Hydronephrosis

Final examination (practicals)

1. Hemoglobin -
2. Blood group -
3. Charts + Specimens -
4. Urinalysis -

Reference Books (latest edition)

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

2 Text book of Pathology Harsh Mohan Jaypee Brothers, New Delhi

3 Practical Pathology P. Chakraborty, Gargi Chakraborty 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 Publication House, Mumbai

6 Text Book of Medical Laboratory Technology RamanikSood

7 Practical Hematology Sir John Dacie Churchill Livingstone, London.

8 Todd & Sanford, Clinical Diagnosis & Management by Laboratory Methods John Bernard Henry All India Travellar Booksellar

9 Histopathology Techniques. I

10 Diagnostic Cytopathology Koss

12 Diagnostic Cytopathology Winifred grey

13 Hand-Book of Medical Laboratory Technology CMC Vellore 14 Basic Hematological Techniques Maniple Manual

Semester III

PERT 302 - Applied Microbiology

Theory

Unit I.

Sterilization and disinfection **12 hrs**

- Sterilization and disinfection - classification, principle, methods
- Central sterile supply department

Unit II.

Importance of sterilization and disinfection **12 hrs**

- Disinfection of instruments used in patient care
- Disinfection of patient care unit
- Infection control measures for ICUs

Unit III.

Health care associated infections **12 hrs**

- Surgical site infections
- Urinary tract infections
- Ventilator associated pneumonia
- Catheter associated blood stream infections
- Antibiotic associated diarrhea

Unit IV.

Drug resistant bacteria **12 hrs**

MRSA

VRE

Drug resistant Gram negative bacteria

Unit V.

Occupationally acquired infections and its prevention **12hrs**

a. Respiratory route - Tuberculosis, Varicella zoster virus, Influenza, RSV
b. Blood borne route - HIV, HBV, HCV, CMV, Ebola
c. Orofecal route - Salmonella, Hepatitis A
d. Direct contact - Herpes virus

Semester III

PERT 302 - Applied Microbiology

Practical

1. Sterilization and disinfection practices in tertiary care hospital
2. Quality control of sterilization and Interpretation of results of sterility testing
3. Collection of specimen from outpatient units, inpatient units, minor operation theatre and major operation theatre for sterility testing.
4. Preparation of materials for autoclaving - packing of materials, loading, holding time and unloading
5. Disinfection of wards, operation theatres and laboratory and air sampling methods

Recommended Books:

1. Textbook of Microbiology by Ananth Narayan and panikar
2. Textbook of hospital infection control by Purva mathur
3. Textbook of Microbiology by Baveja
4. Hospital infection control by Mayhall

Semester III

PERT 303 - Introduction to Perfusion Technology

Theory

UNIT I **12hrs**

History and evolution of Cardiac Surgery & Cardiopulmonary Bypass.

* Dr. John Gibbons Heart Lung Machine
* Cross circulation (Gross Well) technique
* Hypothermic Cardiac Surgery
* Advent of Cardiopulmonary Bypass

UNIT II **12hrs**

Basic Principles of:

* Extracorporeal Circulation
* Extracorporeal gas exchange

Biocompatible Materials used in

Perfusion Aseptic techniques and

Sterility in perfusion.

UNIT III **12hrs**

Basics of diagnostic techniques

* Chest X-ray
* ECG

* Echo
* Coronary Angiography
* Nuclear Cardiology
* Laboratory investigations- arterial blood gas, Venous blood gas, Renal function test, liver function test, coagulation profile, Hemoglobin, hematocrit, platelet, RBC, WBC, Electrolytes

UNIT IV **12hrs**

Basic components used in CPB-

Heart lung

machine,

Oxygenator,

Heater cooler unit

Blood cardioplegia

device ACT Machine

Basics of general Anesthesia.

Types of anesthesia - general anesthesia, regional anesthesia ,local anesthesia Drugs in anesthesia- Propofol, Thiopentone, Ketamine, Etomidate, Muscle relaxants- Vercuronium, Pancuronium, Atracurium Benzodiazepine- Midazolam, Diazepam,

Inhalations agents - Halothane, Sevoflurane, Isoflurane

UNIT V **12hrs**

Basics of monitoring

Setting up of ECG

machine Pressure

transducer

Syringe and peristaltic pumps

Anesthesia

Monitors Pulse ox

meters

Temperature probes and Thermoregulatory monitoring

Defibrillators

Fibrillators

ACT (Activated Clotting Time)

Semester III

PERT 303 - Introduction to Perfusion Technology

Practical

1 Chest X-ray

2 ECG

3 Echo

4 Coronary Angiography

5 Nuclear Cardiology, ACT Machine

6 Laboratory investigations- arterial blood gas, Venous blood gas, Renal function test, liver function test, coagulation profile.

Hemoglobin, hematocrit, platelet, RBC, WBC, Electrolytes, Heart lung machine Oxygenator

Heater cooler unit

Blood cardioplegia

device ACT Machine

Setting up of ECG

machine Pressure

transducer

Syringe and peristaltic

pumps Anesthesia

Monitors

Pulse oximeters

Temperature probes and Thermoregulatory

monitoring Defibrillators

Fibrillators

ACT Activated Clotting Time

Reference Books

1. Cardiac surgery in the Adult- Lawrence H. Cohn.
2. Pediatric cardiac surgery, Constantine Mauraoudis, Isbn 978-1-4051-9652-9.
3. General Thoracic Surgery. Thomas W. Shields (2 Vols) -isbn-13-978-078-779821, Isbn-10-0781779820.
4. Principles and Practice of Medicine.(for Neurology, Nephrology, Cardiology, Gastroenterology, Pulmonology). Davidsons
5. A. Concise Textbook of Surgery. S.Das
6. Braunwalds Heart Disease.
7. L Ees Synopsis of Anesthesia, Nicholas J H Davies.

Semester - III

PERT/AEEC – 304

BIOSTATISTICS & RESEARCH METHODOLOGY

Theory

- Introduction: concepts, types, significance, and scope of statistics, meaning data, sample, parameter, type and level of data and their measurement organization and presentation of data – tabulation of data, frequency distribution graphical and tabular presentation.

- Measures of central tendency: mean, median, mode

- Measures of variability: range, percentiles, average deviation, quartile deviation, standard deviation.

- Normal distribution: probability, characteristics and application of normal probability curve, sampling error.

- Measures of relationship: correlation- need and meaning rank order correlation scatter diagram method, product moment correlation, simple linear regression analysis and prediction.

- Significance of statistic and significance between two statics (testing hypothesis)

- Non-parametric test- chi-square test , sign, median test, mann whitney test. •parametric test -'t' test, anova, manova, ancova and reliability tests

Research methodology

1. Stages of research process

2. Developing ideas and defining a research question

3. Literature review

4. Errors in measurement and their control,

5. Reliability and validity

6. Epidemiological measures of disease frequency

7. Research design:

I. Quantitative (epidemiological)

1 a. Experiment (clinical, field, community)

2 b. Observational

3 i. Cohort

4 ii. Case control

5 iii. Cross sectional study

6 iv. Ecological study

Ii. Qualitative research method (sociological)

i. Developing instruments (delphi technique)

ii. Focus groups

iii. In depth interview

iv. Key informant interview

8. Ethical issues

9. Critical appraisal of a research report

Semester – III

PERT/AEEC – 305

MEDICAL PECORDS MANAGEMENTS

Theory and Practical

- Introduction
- History, need, importance.
- Characteristics of a good medical record.
- Organizational aspects.
- Filing and retention methods.
- Safety measures against fire and Pest control
- Outsourcings of preservation of medical records.

IV Semester

PERT 401- Patient Care and Basic Nursing

Theory

Unit I -

Introduction, Communication and Documentation - 12 hours

1. **Introduction to Patient Care:**

   a) Principles of patient care

   b) Types of patients (gender, age, diseases, severity of illness, triage)

2. **Communication & Documentation:**

   a) Communication with doctors, colleagues and other staffs.

   b) Non-verbal communication, Inter-personnel relationships.

   c) patient contact techniques, communication with patients and their relatives

3. **Documentation:**

   a. Importance of documentation,

   b. initial and follow up notes;

   c. documentation of therapy, procedures and communication

Unit II -

Universal Precautions and Infection Control - 10 hours

4. **Universal Precautions and Infection Control:**

   a) Hand washing and hygiene.

   b) Injuries and Personal protection, Insulation and safety procedures.

c) Aseptic techniques, sterilization and disinfection.

d) Disinfection and Sterilization of devices and equipment

e) Central sterilization and supply department

f) Biomedical Medical waste management

Unit III -

Medication Administration and Transport of patient - 14 hours

5. Medication Administration:

a) Oral / Parenteral route

b) Parenteral medication administration: Intra venous, intra muscular, sub- cutaneous, intra dermal routes, Intra venous Infusion

c) Aerosol medication administration, Oxygen therapy

d) Intravenous fluids,

e) Blood and blood component transfusion

6. Position and Transport of patient:

a) Patient position, prone, lateral, dorsal, dorsal recumbent, Fowler's positions, comfort measures, bed making, rest and sleep.

b) Lifting and transporting patients: lifting patients up in the bed, transferring from bed to wheel chair, transferring from bed to stretcher.

c) Transport of ill patients (inotropes, intubated / ventilated patients)

Unit IV -

Bedside care and monitoring - 14 hours

7. Bedside care:

a) Methods of giving nourishment: feeding, tube feeding, drips, transfusion.

b) Recording of pulse, blood pressure, respiration, saturation and temperature.

c) Bed side management: giving and taking bed pan, urine container.

d) Observation of stools, urine, sputum, drains

e) Use and care of catheters and rubber goods.

f) Care of immobile/bed ridden patients, bed sore and aspiration prevention

8. Monitoring of Patient:

a) Pulse, ECG (Cardiac Monitor), Oxygen Saturation, Blood Pressure, Respiration

b) Multi parameter monitors, Capnography and End Tidal CO2 (ETCO2)

c) Hydration, intake and output monitoring

d) Monitoring ventilator parameters: Respiratory Rate, Volumes, Pressures, Compliance, Resistance

Unit IV -

Wound care and first aid - 10 hours

9. Dressing and wound care:

a) Bandaging: basic turns, bandaging extremities, triangular bandages and their application.

b) Surgical dressing: observation of dressing procedures.

c) Suture materials and suturing techniques

d) Splinting

e) Basic care of patient with burns

10. First Aid and Basic Life Support (BLS)

IV Semester

PERT 401- Patient Care and Basic Nursing

Practical

1. Demonstration of Patient care Procedures:
   a) Positioning of patient, transport of the patient, Dressing and Bandaging, Care of inter costal drain tube, Insertion of naso-gastric tube and feeding
   b) Phlebotomy and obtaining blood samples, Arterial Blood sampling for ABG
   c) Injections: intra muscular, intra venous, sub cutaneous, intra dermal
   d) Insertion of intra venous catheter and infusion of medications, blood transfusion
   e) Recording of ECG and monitoring of patient
   f) Oxygen therapy: oxygen cannula, masks. Aerosol therapy: nebulization, inhalers
   g) Suctioning and care of artificial airway
   h) Insertion of urinary bladder catheter
2. Uses, principles, advantages and disadvantages of instruments and Devices in patient care
3. First aid and Basic Life Support (BLS)

Reference Books:

1. Principles and practice of Nursing - Sr Nancy
2. Introduction to Critical Care Nursing - Mary Lou Sole

3. First Aid - Red cross society guidelines

4. Basic Life Support (BLS) - American Heart Association guidelines

Semester – IV

PERT 402 - Basics of Pumps, Oxygenators, Alters and Blood Components

Theory

UNIT I **12hrs**

Oxygenators

* History of Oxygenators
* Types of Oxygenators

1. Disc and Screen Oxygenators
2. Bubble Oxygenators
3. Membrane Oxygenators

* Design & function of various Oxygenators

UNIT II **12hrs**

Pumps

* History of Pumps
* Characteristics of an Ideal Pump
* Types of Pumps

1. Roller pumps
2. Centrifugal pumps

3. Peristaltic pumps

* Design & function of Roller pumps

* Design & function of Centrifugal pumps

UNIT III **12hrs**

Filters

* Arterial filters

* Craniotomy filters

* Gas line filters

* Leucocyte filters

Types of tubing's used in CPB

Heat Exchangers

UNIT IV **12hrs**

Blood components -

Blood grouping and Cross

Matching PRBC

Whole

blood

Platelets

FFP

Cryoprecipitate

UNIT V **12hrs**

Coagulation system

Platelet Disorders- Thrombocytopenia, Thrombophilia

Coagulation pathway disorders - Von willibrands diseases

Haemophilia DIC- Disseminated intravascular coagulation

* Fibrinolytic system and its disorders

Semester – IV

PERT 402 - Basics of Pumps, Oxygenators, Alters and Blood Components

Practical

Design & function of Roller pumps

* Arterial filters
* Cardiotomy filters
* Gas line filters
* Leucocyte filters

Types of tubing's used in

CPB Heat Exchangers

Recommended Books

1 Cardiopulmonary Bypass Principles and practice 3rd edition- Glenn P. Gravlee, M.D, (Editor) Richard F.Davis MD (Editor), Alfred H.Stammers MSA CCP(Editor)

2 Techniques in Extracorporeal Circulation 4th Edition- Philip H. Kay MA DM FRCS and Christopher M Munsch ChM FRCS (Editors)

3 Cardiopulmonary Bypass Cambridge University- Sunit Ghosh , Florian Falter, Davis J.Cook (Editors)

4 Perfusion for Congenital Heart Surgery notes on cardiopulmonary Bypass for a complex Patient Population - Gregory Matte CCP, LP,FPP

(editor)

5 ECMO, Extracorporeal cardiopulmonary Support in Critical Car, Red Book, Gail M.Annich (author) Publisher: Extracorporeal Life Support Organization.

6 Cardiopulmonary Bypass Neonates , Richard A. Jonas (Editor) Publisher: CRC Press

7 Cardiac Assist Devices, Daniel Goldstein(editor), Mehmet Oz (Editor) Publisher: Wiley-Blackwell

8 Drugs for the heart: Expert Consult- Online and Print,8e Paperback, Lionel H. Opie MD Dphi L Dsc FRCP (Author), Bernard J. Gersh Mb ChB DPhi FACC (Author) Publisher.

Semester - IV

PERT 403- Basics of Medical Disorders

Theory

Objective:

To learn about basic concepts of common medical disorders and its therapeutic options.

Unit I -

Cardiac and Respiratory diseases - 12 hours

1. Cardio vascular diseases
    a. Hypertension, Ischemic heart diseases, Myocardial Infarction, arrhythmias
    b. Heart failure, shock - types, causes
2. Respiratory diseases
    a. Pneumonia, tuberculosis,
    b. Chronic obstructive pulmonary disease, asthma
    c. Pleural effusion, pneumothorax
    d. Interstitial lung disease

Unit II -

Neurological, Renal, GI and infectious diseases - 12 hours

3.Neurological diseases

a. Polio myelitis, Gullian Barre Syndrome, Myasthenia Gravis, epilepsy / seizure disorder, cerebro vascular accident / stroke

4. Renal Diseases

a. Acute kidney injury

b. Chronic Kidney Disease

5. Gastro intestinal and Liver Diseases

a. Gastritis / APD, peptic ulcer

b. Acute gastroenteritis

c. Hepatitis, Hepatic failure, alcoholic liver disease

6. Infectious diseases: Dengue, malaria, leptospirosis

Unitl III -

Blood, fluid, electrolyte and acid base abnormalities - 12 hours

7. Blood loss and Anemia, thrombocytopenia

8. Fluid Electrolyte imbalance and corrective methods

9. Acid Base abnormalities and corrective methods

Unit IV -

Pulmonary Oedema, Sepsis and MODS - 10 hours

10. Pulmonary Oedema, Acute Lung Injury and Acute Respiratory Distress Syndrome

11. Sepsis, multi-organ failure, Multi-organ dysfunction syndrome

Unit V -

Health problems in Specific conditions and Toxicology - 14 hours

12. Health problems in specific conditions
    a. Pregnancy - antenatal care, disorders in pregnancy
    b. Children and new born
    c. Obesity
    d. Diabetes mellitus
    e. HIV infections and AIDS
    f. Elderly subjects and disability
    g. Brief mention about endocrine disorders
13. Poisoning and drug over dosing
    a. Classification of poisons
    b. Principles of treatment of poisoning and Primary care
    c. Poisons and drug over dosing requiring ventilation
14. Miscellaneous
    a. Drowning
    b. Hanging

Semester - IV

PERT 403- Basics of Medical Disorders

Practical

1. History Taking and clinical examination, monitoring of patient.
2. Therapeutic options for various diseases and conditions

   Drugs, Instruments

and devices

X rays, Basic Blood investigation reports

* Case Discussion - 10 marks
* Demonstration of Procedures - 10 marks

Reference Books:

Davidson's Principles and Practice of Medicine - Elsevier

Publications Harrison's Principle of Internal Medicine

Semester - IV

PERT/AEEC 404

ORGANISATIONAL BEHAVIOUR

INTRODUCTION:

All organizations, be the business, educational or government, are social systems. They are run by people. The functioning of an organization depends upon how people work or behave in the organization. Human behavior in organizations is highly unpredictable. It is unpredictable because it arises from people's deep-seated needs and value systems. However, it can be partially understood in terms of the framework of behavioral science, management and other disciplines. There is no idealistic solution to organizational problems. All that can be done is to increase our understanding and skills so that human relations at work can be enhanced.

KEY ELEMENTS OF ORGANISATIONAL BEHAVIOUR:

There are four key elements in organizational behavior. There are people, structure, technology and the environment. Each of the four elements of organizational behavior will be considered briefly.

- People
- Structure
- Technology

- Environment

CHALLENGES AND OPPORTUNITIES FOR ORGANISATIONAL BEHAVIOUR

INTRODUCTION : There are many challenges and opportunities for managers to use Organizational Behavior concepts to enhance the overall effectiveness of individuals, groups and organization. The following are some of the critical issues confronting managers for which the knowledge of Organizational Behavior offers worthy solutions based on behavioral science and other interdisciplinary fields.

SIGNIFICANT PROBLEMS IN MANAGEMENT : The following are some of the significant problems:

- Improving People Skills
- Improving Quality and Productivity
- Managing Workforce Diversity
- Responding to Globalization
- Empowering People
- Coping with Temporariness
- Stimulating Innovation and Change

- Improving Ethical Behavior

i) **Improving People Skills**

ii) **Improving Quality and Productivity**

iii) **Responding to Globalization:**

- An Expatriate manager have to manage a workforce that is likely to have very different needs, aspirations and attitudes from the ones that they are used to manage in their home countries.

- Understanding the culture of local people and how it has shaped them and accordingly learn to adapt ones management style

- Coping with ‘Temporariness
- Stimulating Innovation and Change
- Improving Ethical behavior
- Implications for Managers

Semester - IV

CODE – PERT/AEEC 405

PURSUIT OF INNER SELF EXCLLENCE

- Spiritual Values for human excellence : The value of human integration, Compassion, universal love and brotherhood (Universal Prayer), Heart based living, Silence and its values, Peace and non – violence in thought, word and deed, Ancient treasure of values – Shatsampatti, Patanjali;s Ashtanga Yoga, Yedic education - The role of the Acharya, valued drawn from various caltures and religious practices- Ubuntu, Buddism, etc, Why spiritually? Concept – significance, Thought culture.

- Whys and Means : Correlation between the values and the subjects, Different teaching techniques to impart value education, Introduction to Brighter Minds initiative, Principles of Communication, Inspiration from the lives of Masters for spiritual values – Role of the living Master.

Semester - V

PERT 501 - Conduct of Cardiopulmonary Byepass, Priming Solutions and Cannulation Techniques

Theory

UNIT I **12hrs**

Cardiopulmonary Bypass Circuitry

* Adult circuit
* Paediatric circuit
* Neonatal circuit

UNIT II **12hrs**

Cannulation Techniques

* Arterial cannulation- Aortic, femoral, iliac
* Venous cannulation- SVC, IVC, RA, femoral vein
* Cardioplegia cannulation- Antegrade, Retrograde, Osteal

UNIT III **12hrs**

Priming solutions and Haemodilution in CPB

Crystalloids

Ringer

lactate

Normal

saline

Plasmalyte

A Dextrose

Colloids -

Hetastarch

Albumin

FFP

Additional drugs used in them - Mannitol, Heparin, Bicarbonate

UNIT IV **12hrs**

Conduct of CPB-

Chart Review and selection of

Equipments Assembling the circuit:

Priming and Setting occlusion

Initiation of CPB and Gas

management.

Venting of the Heart and Cardiotomy

Suction Pre-CPB checklist

Pre weaning off bypass checklist

Cardioplegia dosage and

management ABG and ACT

management Adequacy of

Perfusion

Weaning From CPB

UNIT V **12hrs**

Renal System - Presentation, Diagnosis and Management

ARF Acute renal failure

CRF Chronic renal

failure

Why and when do we do

Hemodialysis Types of Dialysis

CNS Aetiology, presentation and diagnosis of

Hemiplegia

Paraplegi

a Stroke

Cerebral haemorrhage

Semester - V

PERT 501 - Conduct of Cardiopulmonary Bypass, Priming Solutions and Cannulation Techniques

Practical

1 Adult circuit

2 Paediatric circuit

3 Neonatal circuit

4 Arterial cannulation- Aortic, femoral, iliac

5 Venous cannulation- SVC, IVC, RA, femoral vein

6 Cardioplegia cannulation- Antegrade, Retrograde, Osteal

7 Assembling the circuit:

8 Priming and Setting occlusion

9 Initiation of CPB and Gas management.

10 Venting of the Heart and Cardiotomy

Suction 11 Cardioplegia dosage and

management

12 ABG and ACT

management 13 Adequacy of

Perfusion

Pre-CPB checklist

Pre weaning off bypass checklist

Semester - V

PERT - 502 Myocardial Protection and Various D drugs used in CPB

Theory

UNIT 1 **12hrs**

Myocardial protection

a) Crystalloid

Cardioplegia - St

Thomas solution,

Del Nido solution,

Custodiol HTK solution -Histidine-Tryptophan-Ketoglutarate

b) Blood cardioplegia delivery

Devices- MPS myocardial

protection system, Cardioplegia

reservoir

UNIT II **12hrs**

Drugs used in CPB:

Vasodilators- Sodium Nitroprusside,

Nitroglycerine, Vasoconstrictors-

Phenylephrine,

Anti Arrhythmic- Amiodarone, Magnesium,

Lignocaine Diuretic- Frusemide, Mannitol

Anticoagulants- Heparin, Low molecular Weight heparin, Dabagantrin

Argatroban Protamine

Steroids- Dexamethasone

UNIT III **12hrs**

a) Coagulation management during CPB and its

reversal Heparin Pharmacology

Heparin Dosing And Monitoring

Heparin Resistance

Alternatives To Unfractionated

Heparin Heparin-Induced

Thrombocytopenia Protamine

Pharmacology

Protamine reaction

b) Temperature management during

CPB Temperature monitoring sites

Types of

hypothermia

Temperature

gradient

UNIT IV **12hrs**

Inhalation agents-

Sevoflurane, Isoflurane

Analgesics- Fentanyl,

Morphine

Sedatives- Midazolam, Thiopentone

Antiplatelets- Aspirin, Clopidogrel, Ticlopidine, Prasugrel

UNIT V **12hrs**

Sodium

Bicarbonate

Potassium

Chloride

Heparin and its alternatives- Bivalirudin, Argatroban,

Lepirudin Inotropes-

Adrenaline,

Noradrenalin

e, Dopamine,

Dobutamine,

Milrinone

Vasopressin

Levosimenda

Semester - V

PERT - 502 Myocardial Protection and Various D drugs used in CPB

Practical

St Thomas solution, Del Nido solution,

Custodiol HTK solution -Histidine-Tryptophan-

Ketoglutarate MPS myocardial protection system,

Cardioplegia reservoir

Vasodilators- Sodium Nitroprusside,

Nitroglycerine, Vasoconstrictors-

Phenylephrine,

Anti Arrhythmic- Amiodarone, Magnesium,

Lignocaine Diuretic- Frusemide, Mannitol

Anticoagulants- Heparin, Low molecular Weight

heparin Protamine

Steroids-

Dexamethasone

Sodium Bicarbonate

Potassium Chloride

Heparin and its alternatives- Bivalirudin, Argatroban,

Adrenaline,

Noradrenalin

e, Dopamine,

Dobutamine,

Milrinone

Vasopressin

Levosimenda

Semester - V

PERT 503 - Cardiac, Thoracic and Vascular Surgical Disorders

Theory

UNIT I **12hrs**

IHD (Ischemic Heart Disease)

ACS - angina types - typical,

atypical STEMI

NSTEMI

MI

Cardiomyopathy-Types, presentation, diagnosis and management of

Presentation, Diagnosis and Management of

Left ventricular failure

Right ventricular

failure

UNIT II **12hrs**

Rheumatic Heart Disease-

Causes, presentation, diagnosis and

management of Mitral stenosis

Mitral regurgitation

Aortic regurgitation

Aortic stenosis

Tricuspid

regurgitation

Tricuspid stenosis

UNIT III **12hrs**

Congenital Heart Disease,

presentation, diagnosis and

management of Atrial septal defect

VSD

PDA

TOF

TGA

TAPVC

Coarctation of aorta

UNIT IV **12hrs**

Vascular Diseases-

Classification, presentation, diagnosis and management of Aneurysms and

dissections Ascending aorta

Arch of aorta

Descending thoracic aorta

UNIT V **12hrs**

Respiratory System

Presentation, Diagnosis and

Management Chronic obstructive

airway diseases Bronchial asthma

Pneumoni

a H_lN_l

Pneumothor

ax

Haemothora

x

Basics of PFT and its interpretation

Semester - V

PERT 503 - Cardiac, Thoracic and Vascular Surgical Disorders

Practical

Case scenarios of adult heart disease, congenital heart disease and thoracic vascular disease and lung diseases mentioned in the above units

Recommended Books

1 Cardiopulmonary Bypass Principles and practice 3rd edition- Glenn P. Gravlee, M.D, (Editor) Richard F.Davis MD (Editor), Alfred H.Stammers MSA CCP(Editor)

2 Techniques in Extracorporeal Circulation 4th Edition- Philip H. Kay MA DM FRCS and Christopher M Munsch ChM FRCS (Editors)

3 Cardiopulmonary Bypass Cambridge University- Sunit Ghosh , Florian Falter, Davis J.Cook (Editors)

4 Perfusion for Congenital Heart Surgery notes on cardiopulmonary Bypass for a complex Patient Population - Gregory Matte CCP, LP, FPP (editor)

5 ECMO, Extracorporeal cardiopulmonary Support in Critical Car, Red Book, Gail M.Annich (author) Publisher: Extracorporeal Life Support Organization.

6 Cardiopulmonary Bypass Neonates, Richard A. Jonas (Editor)

Publisher: CRC Pres

7 Cardiac Assist Devices, Daniel Goldstein(editor), Mehmet Oz (Editor) Publisher: Wiley-Blackwell

8 Drugs for the heart: Expert Consult- Online and Print,8e Paperback, Lionel H. Opie MD Dphi L Dsc FRCP (Author), Bernard J. Gersh Mb ChB DPhi FACC (Author) Publisher.

Semester - V

PERTAECC 504

MEDICAL BIOETHICS

Teaching Objective

- To introduce the wide range of ethical issues in health care.
- To provide basic skills in: A) Approaching ethical issues. B) Analysis and statement of issues. C) Understanding the relevant ethical principles invoked.
- Imparting knowledge and skills that will enable students to develop ethical answers to these issues
- To acquire acquire specialized knowledge of law and IPR.
- The main objective of the IPR is to make the students aware of their rights for the protection of their invention done in their project work.

Learning Outcomes

- Upon successful completion of the course, students will be able to: Recognize what constitutes an ethical concern in health care
- Understanding ethical issues in Health care.
- Understand better the complexity and multi-dimensionality of medical ethical concerns and uniqueness of each problem.
- Capacity to rationally justify your decision
- Develop the ability to reason through difficult medical/clinical ethical issues both orally, in the context of a group of their peers, and through written
- The students get awareness of acquiring the patent and copyright for their innovative works. They also get the knowledge of plagiarism in their innovations which can be questioned legally.

- **Introduction to Bioethics**: Bioethical issues related to Healthcare & medicine.

- **Anatomy :**Cadaver ethics, Human dignity, PNDT, Disposal of cadaver, Genetic Counselling
- **Physiology -** Animal ethics, Health policy privacy
- **Biochemistry & Pathology -** Prudence of investigation confidentiality, Patients bill of rights, Disposal of investigative material, Integrity, Blood transfusion
- **Pharmacology -** Rational drug prescribing, Clinical trials, Risk minimization, Animal ethics
- **Microbiology -** Hand wash, Drug resistance minimization, Prudence of investigation confidentiality, Sterilization procedure, Biosafety and bio hazard
- **Medicolegal aspects of medical records**
- **Introduction to Intellectual Property**:
- Concept of Intellectual Property Kinds of Intellectual Property Patents, CopyrightsDesigns, Trademarks,Geographical Indication, Infringement of IPR, Its protection and Remedies Licensing and its types

Reference Books:

1. Contemporary issues in bioethics – Beauchamp & walters (B&W) 4th edition.
2. Classic philosophical questions by Gloud (8th Edition)
3. Case book series and booklets by UNESCO Bioethics Core curriculum 2008
4. Encyclopedia of Bioethics 5 vol set, (2003) ISBN-10: 0028657748
5. Intellectual property rights- Ganguli-Tat McGrawhill. (2001) ISBN-10: 0074638602,
6. Intellectual Property Right- Wattal- Oxford Publicatiopn House.(1997) ISBN:0195905024.

Semester - V

PERT/AEEC 505

MEDICAL BIOETHICS HUMAN RIGHTS & PROFESSIONAL VALUES

Teaching Objective

• To enable students to present, analyze and interpret data.
• To enable students to use concepts of probability in business situations.
• To enable students to make inferences from samples drawn from large datasets.
• To enable students to apply univariate and multivariate statistical techniques

Learning Outcomes

• To understand the importance & Methodology for research

• To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.

Syllabus

- Introduction of Biostatistics
- Data and its type
- Descriptive statistics
- Measure of Central tendency
- Sampling technique
- Inferential statistics
- Parametric and non-parameters test
- Introduction to research methods
- Identifying research problem
- Ethical issues in research
- Research design

Text books:

(1) Mausner & bahn : Epidemiology-An Introductory text, 2nd Ed.,W.B.Saunders Co.
(2) Richard f. Morton & j. Richard hebd : A study guide to Epidemiology and Biostatistics, 2nd Ed., University Park Press, Baltimore.
(3) Sylvia W Smoller, J Smoller, Biostatistics & Epidemiology A Primer for health and Biomedical professionals, 4th edition, Springs, 2015

VI Semester

PERT- 601 - Effects on Various Organs During CPB and Introduction to IABP and ECMO

Theory

UNIT I **12hrs**

Effect of CPB

Effect of CPB on CNS

Effect of CPB on Respiratory

System Effect of CPB on Renal

system Effect of CPB on Hepatic

system

UNIT II **12hrs**

Effect of CPB on Immune

system Effect of CPB on

Endocrine system

Systemic Inflammatory Response

Syndrome Heparin Resistance

Heparin Induced

Thrombocytopenia Protamine

Reactions

UNIT III **12hrs**

Introduction to IABP

Parts of IABP

machine Parts of

IABP balloon

Insertion sites

Different IABP sizes

Indications, steps of insertion and removal, complications and contraindications

UNIT IV **12hrs**

Introduction to ECMO

Components of ECMO

circuits

Indications and contraindications to

ECMO Types of ECMO

UNIT V **12hrs**

Safety devices in
CPB Level detector
Bubble
detector
Pressure
sensor Pump
slave Hand
cranks
Pulsatile Perfusion

VI Semester

PERT- 601 - Effects on Various Organs During CPB and Introduction to IABP and ECMO

Practical

Level detector Bubble detector Pressure sensor Pump slave

Hand cranks

Pulsatile Perfusion

Introduction to

IABP

Indications, steps of insertion and removal, complications and contraindications

VI Semester

PERT 602 - Special Situations in Perfusion Technology

Theory

UNIT I **12hrs**

CPB CHECK LIST

Prebypass check

list Initiation of

CPB Maintenance

of CPB Weaning

of CPB

UNIT II **12hrs**

CPB special

conditions Foetal

circulation

CPB in pregnancy

Reperfusion injury

UNIT III **12hrs**

CPB in Infants &

Children Selection of

circuit Selection of

cannulae Blood prime

UNIT IV **12hrs**

Management of CPB in Cyanotic

patients Blood Gas Management

ABG

VBG

calculation of circulating

hematocrit Various priming

options

UNIT V **12hrs**

Hemo-concentration

* Conventional ultrafiltration CUF
* Modified Ultra filtration MUF

VI Semester

PERT 602 - Special Situations in Perfusion Technology

Practical

Assembling of CPB circuit Initiation of CPB Maintenance of CPB

* Weaning of CPB Conventional ultrafiltration CUF
* Modified Ultra filtration MUF

VI Semester

PERT 603- Cardiac Support Devices, DHCA and Blood Conservation Techniques

Theory

UNIT I **12hrs**

Intra Aortic Balloon Pump (IABP) in detail

Indications, and contraindications

Setting up of

IABP Steps of

insertion Steps of

removal

Identification and Management of complications

UNIT II **12hrs**

Cardiac Support Devices

Extra Corporeal Life Support (ECMO /

ECLS) Ventricular Assist Devices (LVAD /

RVAD) Artificial Heart

UNIT III **12hrs**

Blood conservation techniques in Cardiac

Surgery Preoperative

Peri

Operative

Post

Operative

Cell Saver

UNIT IV **12hrs**

Deep Hypothermic Circulatory Arrest

(DHCA) **Steps Taken Before Going On**

DHCA Antegrade & Retrograde Cerebral

Perfusion Alpha stat management

Ph stat management

Non hypothermic cardiac surgeries

UNIT V **12hrs**

Minimal Invasive Cardiac Surgeries

CPB for Minimal Invasive Cardiac

Surgeries CPB for Non Cardiac

Surgeries

Recent advances in Perfusion

VI Semester

PERT 603 - Cardiac Support Devices, DHCA and Blood Conservation Techniques

Practical

Intra Aortic Balloon Pump (IABP) in detail

Deep Hypothermic Circulatory Arrest

(DHCA) Antegrade & Retrograde Cerebral

Perfusion

Recommended Books

1 Cardiopulmonary Bypass Principles and practice 3rd edition- Glenn P. Gravlee, M.D, (Editor) Richard F.Davis MD (Editor), Alfred H.Stammers MSA CCP(Editor)

2 Techniques in Extracorporeal Circulation 4th Edition- Philip H. Kay MA DM FRCS and Christopher M Munsch ChM FRCS (Editors)

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Book, Gail M.Annich (author) Publisher: Extracorporeal Life Support Organization.

6 Cardiopulmonary Bypass Neonates, Richard A. Jonas (Editor) Publisher: CRC Press

7 Cardiac Assist Devices, Daniel Goldstein(editor), Mehmet Oz (Editor) Publisher: Wiley-Blackwell

8 Drugs for the heart: Expert Consult- Online and Print, 8e Paperback, Lionel H. Opie MD Dphi L Dsc FRCP (Author), Bernard J. Gersh Mb ChB DPhi FACC (Author) Publisher.

Semester VI

PERT-604 PROJECT RALATED TO PERFUSION TECHNOLOGY

(Assignment to be given to individual student and graded accordingly)

COMPUTERS RELATED TO MEDICAL CARE (CEC 107)

Learning Objectives:-

After studying this course, one should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products

I Introduction to Computers

Introduction, Computers in the field of health care, advantages and disadvantages of computers, applications of computers in various fields, types of computers, basic computer organization, input output devices

II Number Systems

Introduction to number systems, positional and non-positional number system, decimal, binary, octal and hexadecimal systems and number conversion from one system to another.

III Computer codes and computer arithmetic

Computer codes-BCD, EBCDIC, ASCII, Unicode,
binary arithmetic- addition, subtraction, multiplication and division, additive methods for subtraction, multiplication and division

IV Processor and memory

CPU –internal structure and functions of different parts,
Main memory- basics, types, uses
Secondary memory-basics, types, examples with advantages, disadvantages and uses

V Computer software, programming, languages

Software/hardware concept, software types-system and application software, functions
Programming- program planning, algorithm, flowchart and pseudo code concept with example
Languages- Types-machine, assembly, high level, advantages and limitations,

translator program and commonly used high level languages Examples

VI Database management, data and computer communication, internet and multimedia

Data and information concept, two methods to organize data, DBMS, Database models

Basic elements of communication system, techniques, channels and devices, types of computer networks

Concept of internet, basic services, World Wide Web www, uses of internet Multimedia concept, multimedia computer system, multimedia applications

Computer Practical

Microsoft word

Introduction
Introduction to MS-word
Menus
Shortcuts
Document types
Working with documents
Saving, opening new and existing document
Margins, Header & Footer
Using table properties
Editing – Deleting, Cut, Paste, Copy, Replace search, etc
Creating graphs, borders & shading, tables
Printing, page set up etc
Assignments covering above points

Microsoft Excel

Introduction
Introduction to MS-Excel
Opening spread sheet
Shortcuts
Working with Spreadsheets
Opening a file, saving, using Menus
Setting margins, entering data
Rows, columns & cells
Formatting cells
Mathematical operations
Using / creating graphs, labeling & formatting graphs

Assignments covering above points

Microsoft PowerPoint
Introduction
Introduction to PPT
Creating, saving & opening a presentation
Working with templates
Setting backgrounds, presentation layouts
Insert pictures, graphs
Assignments covering above points

SEMESTER III
B.Sc. (Perfusion Technology)

Course Code & Course		Theory Credits (Total Hours)	Practical Credits (Total Hours)	Teaching Hours Per Week		Examination Scheme					
						Theory Marks			Practical Marks		
				Theory /Tutorial	Practical	U/E	I/A	Total	U/E	I/A	Total
CORE COURSE											
PERT 301	APPLIED PATHALOGY	4(60)	4(120)	4	8	60	20	80	80	40	120
PERT 302	APPLIED MICROBIOLOGY	3(45)	4(120)	3	8	60	20	80	80	40	120
PERT 303	INTRODUCTION TO PERFUSIA TECHNOLOGY	3(45)	3(90)	3	6	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
PERT/ AEEC 304	BIOSTATISTICS AND RESEARCH METHODOLOGY	2 (30)		2		60	40	100			
OR											
PERT/ AEEC 305	MEDICAL RECORDS MANAGEMENTS	2 (30)		2		60	40	100			
1 theory credit = 15 classroom &/or experiential learning hours					1 practical credit = 30 practical training hours				**Total Credit Points**		**23**

SEMESTER IV
(B.Sc. (Perfusion Technology)

Course Code & Course		Theory Credits (Total Hours)	Practical Credits (Total Hours)	Teaching Hours Per Week		Examination Scheme					
						Theory Marks			Practical Marks		
				Theory/ Tutorial	Practical	U/E	I/A	Total	U/E	I/A	Total
CORE COURSE											
PERT 401	PATIENT CARE AND BASIC NURSING	3 (45)	4(120)	3	8	60	20	80	80	40	120
PERT 402	BASICS OF PUMPS, OXYGENATORS, ALTERS AND BLOOD COMPONENTS	3 (45)	4(120)	3	8	60	20	80	80	40	120
PERT 403	BASICS OF MEDICAL DISORDERS	3 (45)	4(120)	3	8	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
PERT/ AEEC 404	ORGANIZATION BEHAVIOUR	2 (30)		2		60	40	100			
OR											
PERT/ AEEC 405	PERSUIT OF INNER SELF EXCELLENCE	2 (30)		2		60	40	100			
1 theory credit = 15 classroom & /or experiential learning hours practical credit = 30 practical training							1		**Total Credit Points**		**23**

SEMESTER V
(B.Sc. (Perfusion Technology)

CORE COURSE

Course Code & Course		Theory Credits (Total Hours)	Practical Credits (Total Hours)	Teaching Hours Per Week		Examination Scheme					
						Theory Marks			Practical Marks		
				Theory/ Tutorial	Practical	U/E	I/A	Total	U/E	I/A	Total
PERT 501	CONDUCT OF CARDIOPULMONARY BYPASS, PRIMING SOLUTIONS AND CANNULATION TECHNIQUES	3 (45)	4(120)	3	8	60	20	80	80	40	120
PERT 502	MYOCARDIAL PROTECTION AND VARIOUS D DRUGS USED IN CPB	3 (45)	4(120)	3	8	60	20	80	80	40	120
PERT 503	CARDIAC, THORACIC AND VASCULAR SURGICAL DISORDERS	3 (45)	4(120)	3	8	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
PERT/ AEEC 504	MEDICAL BIOETHICS HUMAN RIGHTS PROFESSIONAL VALUES	2 (30)	-	2		60	40	100			
OR											
PERT/ AEEC 505	HUMAN RIGHTS PROFESSIONAL VALUES	2 (30)	-	2		60	40	100			
1 theory credit = 15 classroom & /or experiential learning hours 1 practical credit = 30 practical training hours									**Total Credit Points**		**23**

SEMESTER VI (Perfusion Technology)												
CORE COURSE												
Course Code & Course		**Theory Credits (Total Hours)**	**Practical Credits (Total Hours)**	**Teaching Hours Per Week**		**Examination Scheme**					
						Theory Marks			**Practical Marks**		
				Theory /Tutorial	**Practical**	**U/E**	**I/A**	**Total**	**U/E**	**I/A**	**Total**
PERT 601	EFFECTS ON VARIOUS ORGANS DURING CPB AND INTRODUCTION TO IABP AND ECMO	3(45)	4(120)	2	6	60	20	80	80	40	120
PERT 602	SPECIAL SITUATIONS IN PERFUSION TECHNOLOGY	3(45)	4(120)	2	6	60	20	80	80	40	120
PERT 603	CARDIAC SUPPORT DEVICES, DHCA AND BLOOD CONSERVATION TECHNIQUES	3(45)	4(120)	2	6	60	20	80	80	40	120
ABILITY ENHANCEMENT ELECTIVE COURSE											
PERT 604	PROJECT RELATED TO PERFUSION TEACNOLOGY	2 (30)		2		60	40	100			
1 theory credit = 15 classroom & /or experiential learning hours 1 practical credit = 30 practical training hours									**Total Credit Points**		**23**