

CURRICULUM FOR BS ANESTHESIA

INTRODUCTION

The BS Anesthesia course is a four years degree programmed aimed at training students in the technological spheres of anesthesia care with a good scientific foundation. These students will be in a position to assist the health care provider (Anesthesiologist, Surgeon). On completion of the course they will play a key role in determine the quality of health care facilities in the province, country and across the globe. With advance training in the latest technology these students will able to open the door of new research in anesthesia technology and ensure the safety of the patient at the maximum.

OBJECTIVES

To equip the anesthesia technologist with modern skills and latest technical knowledge to help in health care delivery system and to prepare the graduate for higher studies and research purpose.

FRAME WORK FOR BS ANESTHESIA

Programmed duration----- 4 year
Total semester----- 8 semesters
Total credit hour----- 124-142
Course load per semester----- 16-18 Cr/hour

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SEMESTER WISE SUBJECTS BS ANESTHESIA

	1ST SEMESTER	
COURSE CODE	Name of Subject	Credits
PMS-101	BIOCHEMISTRY-I	3+1
PMS-102	PHYSIOLOGY-I	3+1
PMS-103	ANATOMY-I	3+1
PMS-104	ENGLISH-I	2+0
PMS-105	PAK STUDIES	2+0
PMS-106	COMPUTER SKILLS	2+0
	Total Credit Hour	18
	2ND SEMESTER	
PMS-107	BIOCHEMISTRY-II	3+1
PMS-108	PHYSIOLOGY-II	3+1
PMS-109	ANATOMY-II	3+1
PMS-110	ENGLISH-II	2+0
PMS-111	ISLAMIC STUDIES	2+0
	Total Credit Hour	16

	3rdSEMESTER	
PMS-208	ANATOMY RELATED TO ANESTHESIA	2+1
PMS-201	GENERAL PATHOLOGY-1	2+1
PMS-202	PHARMACOLOGY-1	2+1
PMS-207	MICROBIOLOGY-I	2+1
PMS-204	HEMATOLOGY	2+1
PMS-206	COMMUNICATION SKILL	2+0
	4th SEMESTER	17
PMS-232	PHYSIOLOGY RELATED TO ANESTHESIA	2+1
PMS-233	PHYSICS RELATED TO ANESTHESIA	2+1
PMS-295	COMMUNITY MEDICINE	2+0
PMS-226	BLOOD BANKING	2+1
PMS-221	GENERAL PATHOLOGY-II	2+1
PMS-220	G/PHARMACOLOGY-II	2+1
	Total Credit Hour	17

5th SEMESTER		
PMS-324	PHARMACOLOGY RELATED TO ANESTHESIA	2+1
PMS-325	ANESTHESIA EQUIPMENT	2+1
PMS-326	HISTORY TAKING PRE-OPERATIVE ASSESMENT & MEDICATION POST-OPE CARE	2+1
PMS-327	ANESTHESIA AND CO-EXISTING DISEASES	2+1
PMS-328	CRITICAL CARE	2+1
PMS-329	LEADERSHIP AND MANAGEMNT	2+0
	Total Credit Hour	17
6th SEMESTER		
PMS-330	DIFFERENT TYPES OF ANESTHEISA	2+1
PMS-331	ANESTHESIA RELATED COMPLICATIONS & THEIR MANAGEMNT	2+1
PMS-332	ANESTHESIA FOR CARDIOTHORIC SURGERY	2+1
PMS-335	ANESTHESIA FOR NEURO,EMERGENCY AND GERIATRIC SURGERY	2+1
PMS-341	RESEARCH METHODOLOGY	2+1
PMS-308	BIOSTATICS	2+1
	Total Credit Hour	17

7th SEMESTER		
PMS-418	ANESTHESIA FOR G/SURGERY /ORTHOPEDEIC AND UROLOGICAL PROCEDURES	2+1
PMS-419	ANESTHESIA FOR EYE SURGICAL PROCEDURES	2+1
PMS-420	ANESTHESIA FOR EAR,NOSE,THORAT SURGERY	2+1
PMS-421	ANESTHESIA FOR OBSTERTIC & PADEATRIC SURGERY	2+1
PMS-495	ELECTROCARDIOGRAPH FOR ANESTHETIST	2+1
PMS-410	EPIDIMOMOLOGY	2+0
Total credit Hour		17
8th SEMESTER		
PMS-406	RESEARCH PROJECT	6+0
PMS-407	SEMINAR	1+0
PMS-422	ANESTHESIA FOR DENTAL, MAXILOFICAL, HEAD AND NECK SURGERY	2+1
PMS-410	BIOETHICS	2+0
Total Credit Hour		12

1st SEMESTER COURSES

- I. MEDICAL BIOCHEMISTRY -I**
- II. HUMAN PHYSIOLOGY-I**
- III. HUMAN ANATOMY-I**
- IV. ENGLISH-I**
- V. PAK STUDIES**
- VI. COMPUTER SKILLS**

PMS-101 MEDICAL BIOCHEMISTRY-I Credit Hours: (3+1)

Course objectives:

- To understand the chemical composition, biochemical role, digestion and absorption of macro and micro molecules of the cell.
- To understand different biochemical reactions in cell.
- To understand mechanism of action of hormones.

Course contents:

Biochemical composition and functions of the cell membrane; Chemistry of signals and receptors; Structure and function of Carbohydrates, Proteins and lipids; biochemical functions of vitamins; biochemical function of Sodium, potassium, chloride, calcium, phosphorus, magnesium, sulfur, iodine and fluoride; Composition and function of saliva, gastric juice, gastric acid(HCL), pancreatic juice, bile and intestinal secretion; Digestion and absorption of proteins, carbohydrates, lipids, vitamins and minerals; Body buffers and their mechanism of action; Acid base regulation in human body; Biochemical mechanisms for control of water and electrolyte balance; Mechanism of action of hormones.

Practicals:

1. Good laboratory Practices
2. Preparation of Solutions
3. Principles of Biochemistry analyzers (spectrophotometer, flame photometer)
4. Determination of Cholesterol, Tg, HDL, LDL, sugar, calcium and phosphorus in blood
5. SOP of centrifuge, water bath and microscope

Recommended Books

- Harper's Biochemistry Robert K. Murray, Daryl K. Granner 28th edition 2009
- Medical Biochemistry Mushtaq Ahmad vol. I and II 8th edition 2013

PMS -102 HUMAN PHYSIOLOGY-I Credit Hours: (3+1)

Course Objectives:

- To understand the basic concepts of physiology beginning from the cell organization to organ system function.
- To understand the organization of cell, tissue organ and system with respect to their functions.
- To Understand the physiology of Respiration, G.I.T, Urinary system and Endocrine system

Course contents:

Functional organization of human body, Mechanism of Homeostasis, Cell structure and its function, function of different Tissue, Functions of the skin, , Types and function of muscle, Neuromuscular junction, functions of the endocrine glands, Breathing Mechanism, Exchange of respiratory Gaseous, Transport of respiratory gases, Function of different part of Digestive system, Function of liver and pancreas, Digestion and Absorption in Gastrointestinal tract, Patho-Physiology of Gastrointestinal Disorders, Formation of Urine by the Kidney, Glomerular filtration, Renal and associated mechanism for controlling ECF, Regulation of Acid-Base Balance, Male Reproductive System (Male), Prostate gland, Spermatogenesis, Female Reproductive System, Menstrual Cycle and Pregnancy and parturition, Mammary Glands and Lactation and Fertility Control

Practicals:

1. Introduction to microscope
2. Bleeding time
3. Clotting time
4. WBCs count
5. RBCs count
6. Platelets count
7. Reticulocytes count

Recommended Books:

- Essentials of Medical Physiology K Sembulingam, Prema Sembulingam Sixth Edition 2013
- Concise Physiology Dr. Raja Shahzad 1st Edition 2012
- Guyton And Hall Textbook Of Medical Physiology John E. Hall, Arthur C. Guyton Professor and Chair 2006
- Ross and Wilson Anatomy and Physiology in Health And Illness 11th Edition Anne Waugh, Allison Grant 2010

PMS-103 HUMAN ANATOMY-I Credit Hours:4(3+1)

Course Objectives:

- To understand the basic concepts of anatomy beginning from the cell organization to organ system function
- To understand the basic concepts of general anatomy including skeleton and musculo skeleton.
- To Understand the anatomy of Thorax Abdomen and pelvis

Course contents:

Musculo skeletal system(Axial and Appendicular),Axial Skeleton, Different bones of human body, Axial and Appendicular Skeleton, Classification on the basis of development, region and function, General concept of ossification of bones, parts young bone, Blood supply of long bones. Joints Structural Regional and functional classification of joints,Characteristics of synovial joints, Classification of synovial joints, Movements of synovial joints. Muscular System Parts of muscle Classification of muscles (skeletal, Cardiac, smooth) Thoracic wall: Muscles of thorax, Surface Anatomy, Trachea, lungs, pleura, mammary glands (breast), Heart and thoracic vessels. Thoracic cavity: Mediastinum, Lungs, bronchi, blood supply and lymphatic Abdominal wall: Skin, nerve and blood supply, Muscles of anterior abdominal wall. Abdominal cavity: General Arrangement of the Abdominal Viscera, Peritoneum, Omenta, mesenteries, Stomach, blood, nerve, lymphatic supply, Small intestine, blood, nervous and lymphatic supply, Large intestine: blood nerve and lymphatic supply. The pelvic wall: Anterior, posterior wall, diaphragm. Pelvic cavity: Ureters, urinary bladder Male genital organs, Female genital organs, Muscles of pelvic region, blood supply, nerve supply, Special Senses.

Practicals:

1. Study Axial and Appendicular skeleton on human skeletal model.
2. Study musculoskeletal system on human musculoskeletal model.
3. Study organs of special senses.
4. Study and understand anatomy of Thorax, Abdomen and Pelvis through:
5. Human Models
6. Video demonstration.

Recommended Books:

- Ross and Wilson Anatomy and Physiology in health and illness 11th Edition Waugh Grant.
- Clinical Anatomy (By regions) 9th edition, Richard S. Snell.
- **Reference books:**
- Netter Atlas of human anatomy 5th Edition Saunders.
- Gray's Anatomy for students 2nd Edition Drake Vogal Mitcell.

PMS -104 ENGLISH –I Credit Hours: 2(2+0)

Course Objective:

- To enable the students to meet their real life communication needs
- To enhance language skills and develop critical thinking

Course Contents:

Vocabulary Building Skills: Antonyms, Synonyms, Homonyms, One word Substitute, Prefixes and suffixes, Idioms and phrasal verbs, Logical connectors, Check spellings, Practical Grammar & Writing Skill: Parts of Speech, Tenses, Paragraph writing: Practice in writing a good, unified and coherent paragraph, Précis writing and comprehension, Translation skills: Urdu to English, Reading skills: Skimming and scanning, intensive and extensive, and speed reading, summary and comprehension Paragraphs, Presentation skills: Developing, Oral Presentation skill, Personality development (emphasis on content, style and pronunciation)

Recommended books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
- Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.

PMS-105 Pakistan Studies (Compulsory) Credit Hours: 2(2+0)

Course Objectives:

- To develop vision of Historical Perspective, Government, Politics, Contemporary Pakistan, ideological background of Pakistan.
- To study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

Course Contents:

Historical Perspective: Ideological rationale with special reference to Sir Syed Ahmed Khan, Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah, Factors leading to Muslim separatism, People and Land, Indus Civilization, Muslim advent, Location and Geo-Physical features.

Government and Politics in Pakistan, Political and constitutional phases: 1947-58, 1958-71, 1971-77, 1977-88, 1988-99, 1999 onward Contemporary Pakistan: Economic institutions and issues, Society and social structure, Ethnicity, Foreign policy of Pakistan and challenges, Futuristic outlook of Pakistan

Books Recommended:

- Akbar, S. Zaidi. *Issue in Pakistan's Economy*. Karachi: Oxford University Press, 2000.
- Mehmood, Safdar. *Pakistan Kayyun Toota*, Lahore: Idara-e-Saqafat-e-Islamia, Club Road, nd.
- Amin, Tahir. *Ethno - National Movement in Pakistan*, Islamabad: Institute of Policy Studies, Islamabad.
- Afzal, M. Rafique. *Political Parties in Pakistan*, Vol. I, II & III. Islamabad: National Institute of Historical and cultural Research, 1998.

PMS -106 COMPUTER SKILLS Credit Course: 2(1+1)

Course objectives:

- To understand the basic of computer
- To utilize the MS office, internet and email

Course Contents:

Introduction to Computer and Window XP/7; MS Office 2007 (Word, Excel, PowerPoint); Internet access and different data bases available on the internet; Email.

Recommended Books:

- Computer science by Muhammad Ashraf, edition 1st 2010

2nd SEMESTER COURSES

- I. MEDICAL BIOCHEMISTRY-II**
- II. HUMAN PHYSIOLOGY-II**
- III. HUMAN ANATOMY-II**
- IV. ENGLISH-II**
- V. ISLAMIC STUDIES**

PMS -107 MEDICAL BIOCHEMISTRY-II Credit Hours: (3+1)

Course Objectives:

- To understand the metabolism of carbohydrates, lipids and proteins.
- To understand clinical role of enzymes in human being.
- To understand about the nutrition.

Course Contents:

Balance food, Major food groups, Nutritional status of Pakistani nation, Metabolic changes in starvation, Protein energy malnutrition, Regulation of food intake, Obesity; metabolism of carbohydrates (Citric Acid Cycle, Glycolysis, Pentose Phosphate Pathway), proteins (urea and corie cycle), nucleotides (uric acid formation) and lipids (beta oxidation); Respiratory chain and oxidative phosphorylation, components of respiratory chain, electron carriers, ATP synthesis coupled with electron flow, phosphorylation of ADP coupled to electron transfer; clinical diagnostic enzymology: clinical significance of ALT, AST, ALP, LDH, CK, CKMB, Pancreatic lipase and amylase, cholinesterase, G6PD, GGT.

Practicals:

1. Determination of liver, cardiac, pancreatic enzymes
2. Determination of urea and uric acid

Recommended Books:

- Harper's Biochemistry Robert K. Murray, Daryl K. Granner 28th edition 2009
- Medical Biochemistry Mushtaq Ahmad vol. I and II 8th edition 2013

PMS -108 Human Physiology-II Credit Hours: (3+1)

Course Objectives:

- To understand the basic concepts of physiology beginning from the organization of the systems to their role in the body.
- Understand the organization and function of various systems
- Understand the physiology of Blood, CVS, Nervous System and special senses
- Students will be able to understand immunity, its types and immune reactions

Course Contents:

Physiology of Nervous System, Function of various cranial nerves, Functions of somatic motor nervous system Functions of the autonomic nervous system, function of neurons, neuroglial cells and their components. Resting membrane potential and an action potential, function of a synapse and reflex arc, functions of the specialized sense organs: Eye, physiology of site, accommodation, optic nerve and optic chiasma, Ear, functions of the internal, middle and external ear Physiology of the hearing and balance, Smell, physiology of olfactory nerve. Taste, physiology of taste Location of the taste buds Physiology of speech, Blood: Composition and function of Blood , haematoposis, Blood grouping, Coagulation mechanism, Physiology of Cardiovascular system The Physiology of Pulmonary Systemic Circulation: Arteries Veins Local Control of Blood Vessels Nervous Control of Blood Vessels Regulation of Arterial Pressure, The function of Lymphatic System, tonsils, lymph nodes, the spleen and the thymus, Classification and physiology of Immune system, Antigens and Antibodies, Primary and secondary responses to an antigen Antibody-mediated immunity and cell-mediated immunity Role of lymphocyte in immunity regulation.

Practicals

1. Spirometry
2. Electrocardiography
3. Blood Pressure Measurement
4. Normal and abnormal ECG interpretation
5. Pulse rate measurement
6. Heart sounds

Recommended Books

- Essentials of Medical Physiology K Sembulingam, Prema Sembulingam Sixth Edition 2013
- Guyton And Hall Textbook Of Medical Physiology John E. Hall, Arthur C. Guyton Professor and Chair 2006
- Ross and Wilson Anatomy and Physiology in Health And Illness 11th Edition Anne Waugh, Allison Grant 2010

PMS -109 HUMAN ANATOMY-II Credit Hours: (3+1)

Course Objectives:

- To understand the basic concepts of anatomy beginning from the cell organization to organ system function
- To understand the anatomy of upper limb, lower limb and head and neck.
- To understand the knowledge about endocrine system

Course contents:

The upper limb Bones of shoulder girdle and Arm, Muscles, Axilla, Brachial plexus, Cubital fossa, the forearm, hand bones, muscles, Blood supply, Nerve supply, lymphatics, The lower limb Fascia, Bones, Muscles, Femoral triangle, Blood supply, Nerve supply, Lymphatic supply. Head and neck Skull, Mandible, Cranial nerves, cranial cavity, Meninges, Brain, Orbit, Neck, Endocrine System Classification of endocrine glands, Pituitary glands, Thyroid Glands, Adrenal gland and differences between the cortex and medulla.

Practicals:

Study and understand the anatomy of Upper limb, Lower limb, Head and Neck through:

1. Human Models
2. Video demonstration
3. Study radiographs of upper and lower limb.

Recommended Books:

Essential books (text books)

- Ross and Wilson Anatomy and Physiology in health and illness 11th Edition Waugh Grant.
- Clinical Anatomy (By regions) 9th edition, Richard S. Snell.

Reference books

- Netter Atlas of human anatomy 5th Edition Saunders.
- Gray's Anatomy for students 2nd Edition Drake Vogal Mitcell.
- BD. Churasia Human Anatomy (All regions)

PMS -110 ENGLISH –II Credit Hours: (2+0)

Course Objectives:

- To enhance students writing, reading and listening skills.
- To enhance language skills and develop critical thinking.

Course contents:

Writing Skill: CV and job application, Technical Report writing, Writing styles, Changing narration: Converting a dialogue into a report, Converting a story into a news report, Converting a graph or picture into a short report or story, Active and Passive voice, Letter / memo writing and minutes of the meeting, use of library and internet recourses, Essay writing, Phrases - Types and functions, Clauses - Types and functions, Punctuation: Tenses - Types, Structure, Function, Conversion into negative and interrogative. Speaking Skill: Group Discussion (Various topics given by the teacher), Presentation by the students (individually), Role Play Activities for improving Speaking. Listening Skill: Listening Various Documentaries, Movies, and online listening activities to improve the listening as well as pronunciation of the words.

Recommended Books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0194313506
- Intermediate by Marie-Christine Boutin, Suzanne Brinand and Françoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- Reading. Upper Intermediate. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.

PMS -111 ISLAMIC STUDIES Credit Hours: (2+0)

Course Objectives:

- To learn about Islam and its application in day to day life.
- To provide Basic information about Islamic Studies
- To enhance understanding of the students regarding Islamic Civilization
- To improve Students skill to perform prayers and other worships
- To enhance the skill of the students for understanding of issues related to faith and religious life.

Course contents:

Fundamental beliefs of Islam, Belief of Tawheed, Belief in Prophet hood, Belief in the Day of Judgment, Worships, Salaat / Prayer, Zakat /Obligatory Charity, Saum / Fasting, Hajj / Pilgrimage, Jihad, Importance of Paramedics In Islam, Ethics, Religion and Ethics, Higher Intents / Objectives of Islamic Sharia and Human Health, Importance and Virtues of Medical Profession, Contribution and Achievements of Muslim Doctors, Knowledge of the Rights, Wisdom and Prudence, Sympathy /Empathy, Responsible Life, Patience, Humbleness, Self Respect, Forgiveness, Kindhearted, Beneficence, Self Confidence, Observing Promise, Equality, Relation among the Doctors, Jealousy, Backbiting, Envy, Etiquettes of Gathering, Relation between a Doctor and a Patient, Gentle Speaking, Mercy and Affection, Consoling the Patient, To inquire the health of Patient, Character building of the Patient, Responsibilities of a Doctor,

Recommended Books:

- Islamiyat (Compulsory) for Khyber Medical University, Medical Colleges and Allied Institutes

3rd Semester Courses

- I. GENERAL PATHOLOGY-I**
- II. GENERAL PHARMACOLOGY-I**
- III. 3.ANATOMY RELATED TO ANESTHESIA**
- IV. HEMATOLOGY-I**
- V. 6. COMMUNICATION SKILLS**
- VI. 7. MEDICAL MICROBIOLOGY-I (Non MLT students)**

PMS- 201 General Pathology-I Credit Hours: (2+1)

Course Objectives:

- To understand different pathological processes
- To the processes blood coagulation and embolism
- To understand the mechanism of wound healing and regeneration

Course Contents:

Introduction to pathology, Cell injury, Cellular adaptation, Acute Inflammation, Chronic Inflammation, Cell Repair & Wound Healing, Regeneration & Repair, Haemodynamic Disorders, Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia, Shock, compensatory mechanism of shock, possible consequences of thrombosis & difference between arterial & venous emboli, Neoplasia, Dysplasia, benign and malignant neoplasms, metastasis

Practicals:

1. Estimation of Prothrombin Time
2. Estimation of Clotting Time
3. Estimation of Bleeding Time
4. Estimation of Activated Partial Tromboplastin Time

Recommended Books:

- Robbins Basic Pathology Kumar Abbas Aster 9th Edition 2013
- Review Of General Pathology Moh. Firdaus 9th Edition
- Short Text Book of Pathology Moh. Inam Danish 3rd Edition 2006

PMS-202 General Pharmacology-I Credit Hours: (2+1)

Course Objectives:

- To discuss the roles and responsibilities of the various members of the health care team in maintaining patient safety during drug therapy.
- To define common terms related to pharmacology and drug therapy.
- To discuss relevant historical, legal, and ethical issues related to pharmacology and drug therapy.

Course Contents:

Definitions of a drug pharmacology, clinical pharmacology, therapeutics, pharmacogenetics, therapeutic index, Pharmacokinetics: Drug passage across cell membrane, Plasma half-life, Steady state concentration, biological half life, Absorption: sites, enterohepatic circulation, bioavailability, factors affecting systemic availability, pre-systemic elimination, effect of food on drug kinetics, Distribution: protein binding, Metabolism: results of metabolism of drugs, sites of metabolism, phases of metabolism, enzyme induction, enzyme inhibition, Elimination: Excretion, Mechanism of drug action: Different mechanisms of drug action. Receptors: Drug binding to receptors, second messenger, receptor regulation. Dose-response relationship: agonist, antagonist, affinity, potency, efficacy, factors modifying drug response. Drug interactions: Definitions. Types of interaction: harmful and useful. Pharmacological basis of drug interaction: pharmacokinetic interactions; pharmacodynamics interactions; antagonism, synergism. An overview of Drugs acting on parasympathetic system, Antihypertensive drugs, An overview of Analgesics: Narcotics and Non-narcotics, An overview of Drugs acting in gastrointestinal tract, Drugs acting on respiratory tract, An overview of Drugs acting on endocrine system.

Practicals:

1. Routes of drug administration
2. Dose-Response Curves
3. Affect of adrenaline on pulse rate
4. Affect of beta blockers on heart rate after exercise
5. Source of drug and identification of some raw materials that are source of drug
6. Weight conversions and measurements
7. Preparation Sulfur ointment
8. Preparation of pilocarpine drops
9. Prescription writing

Recommended Books

- Lippincott's pharmacology (text book) by Mycek 2nd Edition published by Lippincott Raven 2000.
- Katzung textbook of pharmacology (Reference Book) by Bertram Katzung 8th Edition, Published by Appleton.dec 2007.

Course code 208 ANATOMY RELATED TO ANESTHESIA Credit hour 2+1

- Students are expected to understand relevant basic anatomical structures knowledge which helps in the identification of various organs position need for anesthesia practice.

Course Contents

Heart and pericardium, great and major vessels, fetal circulation, mouth nose and pharynx, larynx, trachea and bronchi, pleura and lungs, diaphragm, brain and spinal cord, spinal nerves, cervical plexus, brachial plexus, intercostal nerves, lumbar plexus, sacro-coccygeal plexus, autonomic nervous system, stellate ganglion, coeliac plexus, cranial nerves, vertebral Column, vertebrae, sacrum, ligaments, thoracic inlet, intercostal spaces, abdominal wall and inguinal region, antecubital fossa, large veins of neck and leg,

Practicals:

1. Demonstration of surface feature of the heart
2. Demonstration of great vessels and its branches
3. Demonstration on surface marking of lungs
4. Demonstration on larynx cartilages (cricoids, thyroid, epiglottis cartilages)
5. Demonstration on trachea
6. Demonstration of Brain and Spinal cord

Recommended books:

- Concise Anatomy for Anesthesia. Erdmann., Andres., 2nd edition
- Essential Anatomy for Anesthesia Black., sue., M., Chambers., Alatair., W.,
- Atlas of human anatomy. Netter., Frankh., 5TH edi.

PMS--204 HEMATOLOGY-I Credit Hours: (2+1)

Course Objectives:

- To introduce the students about the basic concepts in Hematology and acquire skill in practical work to produce students steeped in knowledge of Hematology.
- To equip students with latest advancements in the field of hematology.

Course Outlines:

Introduction to hematology, physiology of blood and composition, introduction to bone marrow, structure and function of bone marrow, blood formation in the body (Intra-uterine and extra-uterine), factors governing hematopoiesis, erythropoiesis, different stages and factor effecting on erythropoiesis, granulopoiesis, different stages and factor effecting on granulopoiesis, megakariopoiesis, different stages and factor effecting on megakariopoiesis, introduction to hemoglobin structure, synthesis and function, complete blood count and its importance, morphology of red blood cells and white blood cells, introduction to anemia and classification of anemia, introduction to hemolysis (physiological and pathological), introduction to WBC disorders, introduction to leukemia, etiology, pathogenesis and its classification, leukocytosis, leukopenia, neutrophilia, condition related to neutrophilia, neutropenia, condition related to neutropenia, eosinophilia, condition related to eosinophilia, eosinopenia, condition related to eosinopenia, monocytosis, condition related to monocytosis, monocytopenia, condition related to monocytopenia, lymphocytosis, condition related to lymphocytosis, lymphopenia, condition related to lymphopenia, basophilia, condition related to basophillia, introduction to hemostasis, mechanism of hemostasis, function of platelets and coagulation factors, coagulation cascade, quantitative disorder of platelets, , qualitative disorder of platelets.

Practical:

1. collection of blood sample
2. preparation and staining of peripheral blood smear
3. total leucocyte count, RBC count
4. determination of absolute values
5. differential leucocyte count; platelets count and reticulocytes count
6. to determine the ESR
7. determine bleeding time; prothrombin time; activated partial thromboplastin time

Recommended Books:

- Essential of Hematology, A.V Hoff Brand, 6th edition 2006
- Clinical Hematology, G.C Degrunchi, 5th edition 2002
- Practical Hematology, Dacie J.V. 10th edition 2012

PMS--206 COMMUNICATION SKILLS Credit Hours: (2+1)

Course Objectives

By the end of the course students will be able to:

- Communicate effectively both verbally and non-verbally
- Apply the requisite academic communication skills in their essay writing and other forms of academic writing
- Use various computer-mediated communication platforms in their academic and professional work
- Relate to the interpersonal and organizational dynamics that affect effective communication in organizations.

Course contents:

Introduction to Communication , Meaning and definition of Communication, The process of communication, Models of communication, Effective Communications in Business, Importance and Benefits of effective communication, Components of Communication, Communication barriers, Non verbal communication, Principles of effective communication, Seven Cs, Communication for academic purposes, Introduction to academic writing, Summarizing, paraphrasing and argumentation skills, Textual cohesion, Communication in Organizations, Formal communication networks in organizations, Informal communication networks, Computer- mediated communication (videoconferencing, internet, e-mail, skype, groupware, etc), Business Writing , Memos, Letters, Reports, Proposals, Circulars, Public Speaking and Presentation skills, Effective public presentation skills, Audience analysis, Effective argumentation skills, Interview skills.

Recommended Books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0194313506
- Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- Reading. Upper Intermediate. Brain Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.

PMS--207 MEDICAL MICROBIOLOGY-I (Non-MLT) Credit Hours: (2+1)

Course objectives:

- To introduce the students with basic concepts in bacteriology and mycology.
- To introduce the students with common bacterial and fungal infections.
- To introduce the students with diagnosis of common bacterial and fungal infections.

Course contents:

Historical review and scope of microbiology, sterilization, disinfection and antisepsis, structure and function of prokaryotic cell, difference between prokaryotic and eukaryotic cell, bacterial growth and metabolism, bacterial classification, normal microbial flora of human body, mechanism of bacterial pathogenesis, host parasite interaction, Immune response to infection, common bacterial pathogen prevailing in Pakistan, introduction to fungi, fungal characteristic, morphology, structure, replication and classification, mechanism of fungal pathogenesis, common fungal pathogen prevailing in Pakistan.

Practical:

1. Introduction and demonstration of Laboratory Equipments used in Microbiology.
2. Inoculation and isolation of pure bacterial culture and its antibiotic susceptibility testing.
3. Demonstration of different types of physical and chemical methods of sterilization, and disinfection.
4. Students should be thorough to work with compound microscope.
5. Detection of motility: Hanging drop examinations with motile bacteria, non-motile bacteria.
6. Simple staining methods of pure culture and mixed culture.
7. Gram's staining of pure culture and mixed culture.
8. AFB staining of Normal smear, AFB positive smear.
9. KOH preparation for fungal hyphae.
10. Germ tube test for yeast identification.
11. Gram stain for candida.

Recommended books:

- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- Clinical Microbiology Made Ridiculously Simple. Gladwin, M., & Trattler, B., 3rd ed. MedMaster, 2004.
- Medical Microbiology and Infection at a Glance. Gillespie, S., H., Bamford, K., B., 4th ed. Wiley-Blackwell, 2012.
- Medical Microbiology, Kayser, F., H., & Bienz, K., A., Thieme, 2005.
- Review of Medical Microbiology and Immunology. Levinson, W., 10th ed. McGraw Hill Professional, 2008.
- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

4th SEMESTER COURSES

1. GENERAL PHARMACOLOGY-II

2. GENERAL PATHOLOGY-II

**3. PHYSIOLOGY RELATED TO
ANESTHESIA**

4. PHYSICS RELATED TO ANESTHESIA

5. COMMUNITY MEDICINE

6. HEMATOLOGY II (Non MLT Students)

PMS--220 GENERAL PHARMACOLOGY-II Credit Hours: 3(2+1)

Course objectives:

- To provide quality patient care in routine as well as advanced procedures.
- To understand the mechanism of drug action at molecular as well as cellular level, both desirable and adverse.
- To understand the principles of pharmacokinetics i.e. drug absorption, distribution, metabolism and excretion and be able to apply these principles in therapeutic practice.

Course contents:

Drugs acting on cardiovascular system; Drugs for heart failure, anti hypertensive drugs, anti arrhythmic drugs, antianginal drugs, Anti Hyperlipidemic drugs, Blood drugs, Diuretics, Insulin and glucose lowering drugs, Chemotherapeutic drugs, Antibiotics, Drugs acting on Respiratory system, Anesthetics.

Practical:

1. Routes of drug administration
2. Dose-Response Curves
3. Affect of adrenaline on pulse rate
4. Affect of beta blockers on heart rate after exercise
5. Source of drug and identification of some raw materials that are source of drug
6. Weight conversions and measurements
7. Preparation Sulfur ointment
8. Preparation of pilocarpine drops
9. Prescription writing

Recommended Books:

- Lippincott's pharmacology (text book) by Mycek 2ndEdition published by Lippincott Raven 2000.
- Katzung textbook of pharmacology (Reference Book) by Bertram Katzung 8th Edition, Published by Appleton.dec 2007.

PMS--221 GENERAL PATHOLOGY-II Credit Hours : (2+1)

Course Objectives:

- To introduce students with different environmental hazards
- To gain knowledge of some basic systemic diseases

Course contents:

Health effects of climate change, toxicity of chemical and physical agents, environmental pollution, effect of tobacco, effect of alcohol, injury by therapeutic drugs and drugs of abuse, general principles of microbial pathogenesis, special techniques for identifying infectious agents, agents of bioterrorism, heart failure, congenital heart diseases, ischemic heart diseases, hypertensive heart diseases, arrhythmias, atelectasis, chronic obstructive pulmonary disease, asthma, bronchiectasis, pneumonias, pneumothorax, hemothorax, nephrotic syndrome, renal stone, hydronephrosis, aphthous ulcer, gastritis, peptic ulcer, hemorrhoid, jaundice, liver cirrhosis, viral hepatitis, cholecystitis, urinary tract infections, arthritis, facial palsy

Practicals:

1. Helicobacter pylori test
2. Diagnosis methods of UTI
3. Determination of renal function tests
4. Determination of liver function tests
5. Determination of cardiac profile

Recommended Books:

- Robbins Basic Pathology Kumar Abbas Aster 9th Edition 2013
- Review Of General Pathology Moh.Firdaus, 9th Edition
- Short Text Book of Pathology Moh. Inam Danish 3rd Edition 2006

COURSE CODE 232 PHYSIOLOGY RELATED TO ANESTHESIA Credit hour (2+1)

- Students are expected to understand various physiological mechanisms, principles, and application these, in anesthesia practice. To demonstrate abilities to maintained the
- Various physiological variables with in normal range.

Course contents

Heart rate regulation, cardiac performance, coronary circulation, cardiac output and its regulating factors, blood pressure, heart sound, pulse, ECG, mechanism of respiration, control of respiration, lung volumes and capacities, transport of respiratory gases, respiratory reflexes, hypoxia, artificial respiration, formation and circulation of cerebrospinal fluid(CSF),intra cranial pressure, Receptors, muscles, neuromuscular junction, Synapses, Acid base balance, Diuretics, mechanisim of vomiting, liver physiology and anesthesia, pancreas physiology and anesthesia, gall bladder, thermoregulation ,pain mechanism,

Practiacs:

1. Recording of blood pressure and pulses rate normal & following exercise
2. Electro Cardio Gram (ECG) tracing on a normal and pathological conditions
3. Auscultation of heart sounds and interpretation
4. Spirometry and description of normal and pathological findings
5. Different pulse and measurement
6. Understand pain scale and its application
7. Normal hemoglobin level

Recommended books:

- Pharmacology and physiology in anesthesia.K.,Robert,. Stoelting,.Hiller,.C,. Simon,. 2nd edi.
- Text book of Medical physiology. Guyton & Hill,. 12th edition.
- Fundamental of anesthesia.Smith,.Tim,. Colin pinock,. Ted line,. Johan,.Robert,. 3RD edition.

COURSE CODE: 233 PHYSICS RELATED TO ANESTHESIA Credit hour: (3+1)

- Students are expected to understand states of matter, principles of dynamics of gases and fluid, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of in the realm of physics

Course contents:

Fundamental concepts in systemic international unit, temperature, gas laws, kinetic theory of gas, color coding of anesthetic gases, cylinders, medical gas pipeline system and station, air compressor, oxygen concentrator, gas administration devices, oxygen therapy, humidification, aerosol spray. Dynamics of inhalational anesthesia, anesthetic transfer process, measure flow system, hypobaric state, hyperbaric state, laminar flow, turbulent flow, dalton's law, minimum alveolar concentration (mac), specific heat, heat vaporization, pneumothorax, air embolism, square-root-of-time rule and anesthetic uptake, anesthesia machine resistance, turbulent flow, rebreathing, dilution, leak, humidity, heat, second gas effect, principle of doppler ultrasound ,waste gas evacuation, mechanical dead space, oxygen purification detector device

Practicles:

1. Understanding of anesthesia cylinder, color coding, arrangement of different type of cylinder
2. Medical gas pipeline system
3. Understanding administration of gas flow
4. Simple oxygen administration devices
5. Method of controlling gas flow
6. Oxygen concentrator
7. Use of oxygen purity meter
- 8.

Recommended books:

- Physics in anesthesia for ODPS, Nurse Anesthetists. Middleton,.Ben,. Stacey,.Thomas,.Rik,. Tustin,. Phillips,.3rd edition.
- Basic physics and measurement in anesthesia.Davis,. Pual,. Kenny,.Gravin,. 5th edition.
- Physics related to anesthesia,.D,. Johan ,. 2ND edition.

PMS—295 COMMUNITY MEDICINE Credit Hours :(2+0)

Students are expected to understand the knowledge regard to community base health problems, communicable and non-communicable diseases, apply knowledge in practice. To highlight the significance of the community medicine in medical and applied social sciences regarding its history applications and development.

Course Contents:

Basic definition, primary health care, health education and its methods, personal hygiene, dental hygiene, nutrition, water supply, WHO criteria for safe water, sanitation, mother and child health (MCH),family planning, immunization, mental health, drug abuse, common communicable diseases, air pollution and measures to control it, common vector of diseases and methods to hamper them.

RECOMMENDED BOOKS:

Ilyas Ansari's community medicine (Text Book) by Ilyas and Ansari 2003 published by Medical division Urdu Bazaar Karachi

K Park's community medicine (Reference Book) by K Park 2003 Published by Banarside Bhanot Jaipur India.

PMS--226 Hematology II (Non-MLT) Credit Hours: 3(2+1)

Course Objectives:

- To introduce the students about the basic concepts in Hematology and acquire skill in practical work to produce a team of Medical Technologists steeped in knowledge of Pathology.
- To equip Medical Technologists with latest advancements in the field of hematology.

Course Outlines:

Iron metabolism, introduction to iron deficiency anemia, different stages and diagnosis, introduction to thalassemia, classification, pathophysiology and its diagnosis, introduction to Sideroblastic anemia, etiology and diagnosis, folat and vitamin B12 metabolism, introduction to megaloblastic anemia, etiology and diagnosis, introduction to G6PD deficiency anemia, pathophysiology and diagnosis, introduction to sickle cell anemia, pathophysiology and diagnosis, introduction to hereditary spherocytosis, pathophysiology and diagnosis, introduction to hemolytic anemia, Immune hemolytic anemia, non immune hemolytic anemia, aplastic anemia, etiology and diagnosis.

ABO and Rh D group system, kell blood group system, ked blood group system, duffy blood group system, donor selection criteria, phlebotomy of donor, blood products, preparation, storage and its importance, hem vigilance in blood bank, cross match, types of cross match, procedure and its importance, blood grouping and its importance, coomb,s test, types and importance , introduction to hemolytic disease of newborn, types, pathophysiology, diagnosis and management, hemolytic transfusion reactions and management.

Practicals:

1. ABO blood grouping (Forward and Reverse grouping)
2. Rh Blood grouping
3. Antibodies screening
4. Cross matching (Major and Minor)
5. Coombs tests (Direct and Indirect)
6. Separation of different blood components
7. Du Test

Recommended books

- Essential of Hematology, A.V Hoff Brand, 6th edition 2006
- Clinical Hematology, G.C Degrunchi, 5th edition 2002
- Practical Hematology, Dacie J.V. 10th edition 2012

5TH SEMESTER COURSES

- 1. PHARMACOLOGY RELATED TO ANESTHESIA**
- 2. ANESTHESIA EQUIPMENT**
- 3. HISTORY TAKING PRE-OPERATIVE ASSESSMENT & MEDICATION POST-OPERATIVE CARE**
- 4. ANESTHESIA AND CO-EXISTING DISEASES**
- 5. CRITICAL CARE**
- 6. LEADERSHIP AND MANAGEMENT**

COURSE CODE 324 PHARMACOLOGY RELATED TO ANESTHESIA Credit hour: (2+1)

- Students are expected to understand pharmacodynamics and kinetics of anesthetic agents and its application in anesthesia practice. To demonstrate abilities of preparation of dosages as per requirement of the individual and manage complications arise as consequences of anesthetic agent administration.

Course contents:

Narcotic analgesic, pharmacokinetics, pharmacodynamics, Opioid receptors, Classification of opioids, Non-narcotic analgesics, Local anesthetic drugs, intravenous anesthetic agents, inhalational anesthetic agents, muscle relaxants, reversal agents, anti-emetic drugs, anxiolytic drugs, emergency drugs.

Practicals:

- 1) Preparation and dosage of drugs relevant to anesthesia
- 2) Labeling of drugs
- 3) Construct emergency trolley
- 4) Check out date of expiry
- 5) color of the drugs and variation

Recommended Books:

- Anesthetic pharmacology. Evers, Alex, & Maze, Mervyn, Kharasch, D., even, 2nd edition.
- Principles and practice of pharmacology for anesthesia. Calvey, Norman & William, Norton, 5th edition.
- Text book of Anesthesia. Aitkenhead, Alan, R., 5TH edition.
- Lippincott's pharmacology. Howland, Richard, D., & Mycek, Mary, J., 3rd edit.
- Clinical anesthesiology. Morgan & Mikhail's, 5TH edit.

Course code: 325 ANESTHESIA EQUIPMENT Credit Hour : (2+1)

- Students are expected to understand the working principles various tools use for anesthesia provision, to ensure safe practice. To demonstrate abilities in managing technical fault arise intra-operatively and correct the calibration of different anesthetic instruments/equipment.

Course contents:

Anesthesia machine its different parts, working principles, medical gas supply devices, vaporizers, pulse oximeter, face masks and laryngoscope, breathing circuits, anesthesia ventilator and working principles, monitoring devices, manual resuscitation bags, defibrillator and its working principles, methods of autoclaving, glucometer, nerve stimulator, laryngeal mask airway, endo tracheal tubes(ETT), airways(oral and nasal),suction machine, infusion pump, reservoir bags, resuscitator bags, thermometer ,spagymometer, stethoscope, oxygen purity meter, Operation theater table, flexible endoscope, intravenous cannulas, spinal needle, epidural catheter, Magill gag, Magill incubating forceps, latest technology.

Practicals:

- 1) Arrangement of anesthesia Machine
- 2) Anesthesia Machine safety system
- 3) Sterilization of anesthesia equipment
- 4) Arrangement of anesthesia breathing circuits
- 5) Use of stethoscope and blood pressure apparatus

Recommended Books

- Anesthesia equipment principles and applications.Ehrenwerth,Jan.,Eisenkraft,James.,Berry,James.,2nd edition.
- Manual of anesthesia. K.,Arun.,4th edition. Paul Jaypee Brothers Medical Publisher(p) Ltd.
- Essential of Anesthesia equipment. Sakaih.,Bahal al., & Stacey.,Simon., 3rd edi.
- Clinical anesthesiology. Morgan & Mikhail's., 5TH edit.
- Text book of Anesthesia. Aitkenhead.,Alan.,R., 5TH edition.

COURSE CODE: 326 PRE-OPERATIVE HISTORY, PREPARATION & POST –OP CARE
Credit hour: (2+1)

- Students are expected to understand various health problem and their negative impacts on the practice of safe anesthesia. Todemonstrate abilities of predicating morbidity and mortality and utilize their skills and knowledge to minimize such impacts.

Course contents:

History taking, physical examination, systemic examination, laboratory investigation, predication of pre-operative morbidity and mortality, predication of specific events arise inter-operatively, patient preparation, anesthesia equipment preparation, medication requires pre-operatively, post-operative airway care, pain management, cardiovascular system stability, renal system stability.

Practicals:

- 1) Taking history in surgical ward for elective case
- 2) History taking in surgical Accident & Emergency department
- 3) Pre of equipment and anesthesia machine preparations
- 4) Develop various predicating risk scale for patient health related problems
- 5) Special attention to check list of the patient
- 6) Airway examination
- 7) Risk assessment

Recommended Books:

- Pre-operative assessment and Pre-operative management. Radford,.Mark,.
- Pre-operative assessment & Mnagemnt.Sweitzer,.Bobbie,.Jean,.2nd edition.
- Evidence-based Practice of Anesthesiology.Fleisher,.A,.lee,.3rd edition.
- Text book of Anesthesia. Aitkenhead,.Alan,.R,. 5TH edition.
- Clinical anesthesiology. Morgan & Mikhail's,. 5TH edit.
- Apractice of anesthesiology.Healy,.E,.J,.Thomas,.7th edition.
- Fundamental of Anesthesia. Smith,.Tim,. Pinock,.Colin,. line,.Ted,.Johan ,.Robert,.3rd edition.

COURSE CODE 327 ANESTHESIA AND COEXISTING DISEASES Credit Hour:2+1

- Students are expected to understand common diseases and its negative impacts in anesthesia practice and to demonstrate abilities which minimize morbidity and mortality in such patients.

Course contents:

Diabetes Mellitus, Hypertension, Ischemic heart disease, Arrhythmia & heart blocks ,Obesity, Shock, Chronic renal failure, chronic liver disease/failure, hematological disorder, Epilepsy, cerebral vascular accident (CVA), bronchial asthma, Thyroid disease, pheochromocytoma, COPD, pneumonia, upper respiratory tract infection(UTI),myasthenia gravis, pulmonary edema, pregnancy associated diseases, renal disorder, fluid and electrolyte imbalance,

Respiratory tract infection, acromegaly, rheumatoid arthritis, alcohol abuse, obstructive sleep apnea, hemophilia, spinal cord disorder.

Practicals:

- 1) Calculate dosage of insulin for patient intra-operatively
- 2) Determine ischemic heart diseases through ECG interpretation.
- 3) Setting of ventilator modes for various respiratory diseases
- 4) Compilation of data related to blood disorders
- 5) Collection of electrolyte disturbance data in various renal diseases.
- 6) Collection of data relevant to liver abnormal biochemistry

Recommended books:

- Anesthesia and co-existing diseases. Roberta I.hines,.6th edition.
- Evidence-based practice of anesthesiology.fleisher,.a,.lee,.3rd edition.
- Text book of anesthesia. Aitkenhead,.alan,.r,. 5th edition.
- Clinical anesthesiology. Morgan & mikhail's,. 5th edit.
- Apractice of anesthesiology.healy,.e,.j,.thomas,.7th edition.
- Fundamental of anesthesia. Smith,.tim,. Pinock,.colin,. Line,.ted,.johan ,.robert,.3rd edition.

COURSE CODE:328 CRITICAL CARE credit hour 2+1

- Students are expected to understand various critical cardiovascular situations, categorize the patient, assess critically ill patient, and know about pharmacological intervention - mechanical procedure necessary to stabilize the pumping system of the human body.

Course contents:

An introduction to critical care, Shock, Resuscitation in intensive care an operation theater, Cardiovascular monitoring in critical care, Cardiovascular investigation of the critically ill, Hematological Aspects of cardiovascular critical care, Cardiovascular support: Pharmacological , Arrhythmias , Mechanical heart failure therapy, Care of the high risk patient undergoing surgery , Common complications of cardiovascular critical illness , Acute coronary syndromes and myocardial infarction , Cardiogenic shock , Aortic dissection , Emergency management of cardiac trauma , Hypertensive crises , Endocrine problems and cardiovascular critical care fluid and electrolytes, acid and base balance

Practicals:

- 1) Assessment of shock and its types
- 2) Assessment of arrhythmias
- 3) Management of shock
- 4) Management of arrhythmias
- 5) Management of Cardiac arrest
- 6) Management of acute Myocardial infarction
- 7) Management of Hypertensive crisis
- 8) Analysis of arterial blood gases
- 9) Management of Cardiac trauma and aortic dissection

Recommended books:

- Principles of critical care.Hall,.schmidt,.and wood,s,.4th edition.
- Principle of critical care.Farokh,.erach,.udwadia,.3rd edition.
- Critical care manual.wilson,. francis,.robert,.2nd edition.
- Cardiovascular Critical Care. Mark J.D. Griffiths,. Jeremy J. Cordingley and Susanna ., 010 Blackwell Publishing Lt d.
- Rosen emergency medicine manual.Adams,.Barsan,.Biros,.Danzl,. 5th edition.

COURSE CODE: 329 LEADERSHIP AND MANAGEMENT Credit hour: (2+0)

- Students are expected to understand various leadership models, styles of leadership, to gain the expertise to maximize result with minimum effort, to utilize the resources in skill full manner and ensure human betterment and justice.

Course contents:

Introduction of leadership, theories, process model, skill of leadership, principles of leadership, emotional intelligence, professionalism. introduction of management, scope policy making, procedure and method of planning, limitation of planning, importance of organization, line relationship, staff relation, functional relation, committee organization, motivation and their theories, motivational technique, communication, Controlling: span of control, factors limiting effective control, super management, general manager, middle manager, supervisor, planning and controlling relationship, management control process. budget, principles and technique of co-ordination, personal management, staffing and work distribution technique, recruitment and selection process, complaints and grievances, termination of employee, health and safety of employee, financial management, profit maximization, return maximization, short, middle, long term financing,

Recommended books:

- The art of medical leadership. Susan Oran. Scott Conrad
- Strategic management. Ritson, Neil
- Management basics. Quinn, Susan,
- Emotional intelligence. MTD training
- On Becoming A Leader. Bennis, Warren, 4th edition.
- How To Win Friends & Influence. Kouzes, M., James, & Posner, Z., Barry, 5th edition.

6TH SEMESTER COURSES

- 1. DIFFERENT TYPES OF ANESTHESIA**
- 2. ANESTHESIA RELATED COMPLICATIONS & THEIR MANAGEMENT**
- 3. ANESTHESIA FOR CARDIOTHORIC SURGERY**
- 4. ANESTHESIA FOR NEURO, EMERGENCY AND GERIATRIC SURGERY**
- 5. RESEARCH METHODOLOGY**
- 6. BIostatistics**

COURSE CODE 330 DIFFERENT TYPES OF ANESTHESIA Credit Hour (2+1)

- Students are expected to understand various anesthetic procedures, build specific anatomical ground need for local blocs, instill the confidence to handle problems and overcome the complication born as consequences of various anesthetic procedure, to know about the material use in various blocs and anesthetic procedure.

Course contents:

Definition of anesthesia, Regional anesthesia era, Intravenous anesthesia era, Modern anesthesia era, , General anesthesia, retrograde tracheal intubtion, total intravenous anesthesia, anesthesia with ketamin, subarchanid and epidural anesthesia and analgesia ,bier,s block,axillary block, ankle block,caudal block(adult and pediatric),central line placement, cervical plexus block, digit block,femoral block,penile block,sciatic nerve block, supraclivical block, regional anesthesia for thorax, field block, surface anesthesia

Practicals:

- 1) Understanding various spinal meddles
- 2) Use of local anesthetic agents and quantity require as per the need
- 3) Enlist the complications observed by the candidate during their clinical rotation
- 4) Expert in the reliability of different instrument in use

Recommended books:

- Peripheral nerve blocks.Hadzic,.admir,.2nd edition.
- Ultrasound guided regional anesthesia.Grant,.A,.stuart,& Auyong,.B,.david.2nd edition.
- Evidence-based Practice of Anesthesiology.Fleisher,.A,.lee,.3rd edition.
- Text book of Anesthesia. Aitkenhead,.Alan,.R,. 5TH edition.
- Clinical anesthesiology. Morgan & Mikhail's,. 5TH edit.
- Apractice of anesthesiology.Healy,.E,.J,.Thomas,.7th edition.
- Fundamental of Anesthesia. Smith,. Tim,. Pinock,. Colin,. line,.Ted,.Johan ., Robert,.3rd edition.

COURSE CODE 331 ANESTHESIA COMPLICATIONS AND THEIR MANAGEMENT
credit hour (2+1)

- Students are expected to understand various complications and unwanted event emerged intra operatively, post operatively and its proper management to ensure patient safety.

Course contents:

Laryngospasm, bronchospasm, pneumothorax, atelectasis, difficult intubation, injury during airway management, one lung intubation, aspiration of gastric content, hiccups, hypotension, hypoxemia, apnea, hypercapnea, hypertension, bradycardia, tachycardia, arrhythmias, myocardial infarction, hemorrhage, embolus, awareness, central nervous system ischemia, Malignant hyperthermia, hypersensitivity, local anesthetic toxicity, ophthalmic injury, thermal and electric injury, miscellaneous, choline apnea,

Practicals:

- 1) Identification of laryngospasm and its management
- 2) Maintenance of proper supply of medical gases
- 3) Measurement of partial pressure of carbon dioxide through capnograph
- 4) Electrical device and its safe use
- 5) N/G tube placement in case of full stomach patient
- 6) Maintenance of emergency tray
- 7) Instrument need for emergency chest intubation

Recommended books:

- Clinical anesthesiology. Morgan & Mikhail's, 5TH edit.
- Text book of Anesthesia. Aitkenhead, Alan, R., 5TH edition.
- Anesthesia and co-existing diseases. Roberta L.Hines, 6TH edition.
- Evidence-based Practice of Anesthesiology. Fleisher, A., Lee, 3rd edition.
- A practice of anesthesiology. Healy, E., J., Thomas, 7th edition.
- Fundamental of Anesthesia. Smith, Tim, Pincock, Colin, line, Ted, Johan, Robert, 3rd edition

COURSE CODE 332 ANESTHESIA FOR CARDIOTHORIXIC Credit Hour 2+1

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of cardi thoracic surgery. These include:

Course contents:

NYHA classification, arrhythmias, angina, dyspnea, echocardiography, angiography, monitoring and preparation, care and use of arterial and venous line, anesthesia for open heart surgery, transport to ICU and its management, chest tube management, pulmonary function test, pre-operative preparation and medication, check list, use of double lumen tube, monitoring and pain management, extubation and transferring to ICU, sore throat, nausea and vomiting, neurological complication, neurological complications, ocular and auditory complication, headache and backache and vascular complication.

Practicals:

- 1) Perfusion machine and its significance for anesthesia
- 2) Cardiologic drugs and dosage
- 3) Infusion pump and its significance
- 4) Double lumen tube and its use
- 5) Need for one lung ventilation
- 6) Reducing dead space in anesthesia circuit

Recommended books:

- Cardiovascular and thoracic anesthesia. Gothard, John, Andrea, Kelleher & Haxby, Eliabeth, 2nd edition.
- Anesthesia for cardiac surgery. DiNardo, A. James, & Zvara, A. David, 3rd edition.
- Pediatric cardiac anesthesia. Coral, I. Lake, & Peter, D. Booker, 4th edition.
- Cardiac anesthesia. Jr. Hensley, A. Frederick, Martin, E. Donald, & Glenn, P. Gravlee, 5th edition.
- Thoracic anesthesia. Kaplan, A. Joel, & Slinger, D. Peter, 3rd edition.

COURSE CODE 335 ANESTHESIA FOR NEUROSURGRY/EMERGENCY/GERIATRIC
C/Hour 2+1

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of neurosurgery, emergency and geriatric.

Course contents

Glass cow coma scale, premedication, investigation, check list of equipment, induction of anesthesia, use of reinforce ETT, positing in neurosurgery, intracranial pressure, air embolism, reversal of the patient, transferring to ICU, resuscitation of shock patient and their circulatory management, rapid sequence induction, physiology of aging, diseases of aging, nervous system, geriatric pharmacokinetic and pharmacodynamic, nervous system dysfunction,

Practicals:

- 1) Setting and maintenance of OT table
- 2) Ensure proper I.V line
- 3) Use of sevoflurane vaporizer in neurosurgery
- 4) Exertion of cricoid pressure in emergency surgery
- 5) N/G tube placement
- 6) Blood transfusion
- 7) Arrangement of colloid and crystalloid fluid
- 8) Maintenance and ensure availability of defibrillator
- 9) Urethral catheter placement
- 10) Suction machine function surety
- 11) Labeling of drugs and dosage preparation in aged patient

Recommended books:

- Anesthesia Emergencies. Ruskin, J., Keith, & Rosenbum, H., Stanley.
- A Practical Approach to Anesthesia for Emergency surgery. Manju, N., Gandhi, Malde, D., Anila, Amala, G., Kudalkar, Karnik, S., Hemangi.
- Clinical Anesthesia in Neurosurgery. Frost, A., M., Elizabeth, 2nd edition.
- Applied Geriatric Anesthesia. Paul, Kumar, Arun, 7th edition.

PMS--310 RESEARCH METHODOLOGY Credit Hours: (2+1)

Course Objectives:

- To introduce the significance of research methodology foundation, concept of measurement, design clinical research and health system research to the students.

Course contents:

Introduction to research (in simple term and a scientific term), concept of research, why do need research, advantage of research, identification of research need and its qualities, component of research, ethical and legal aspect of research and objective of research (definition, purpose, structure) Relevance, Avoidance of duplication, Physibility, Political acceptability, Applicability, Cost efficiencies, work plan, budget required for research work, literature searching, statistical help, material, type of manuscript, printing of manuscript for submission and postage, Principles and reliability of measurement, errors and sources of measurement, types of measurement, measure of disease frequency and screening (introduction, validity and screening test) Studies design (introduction, selection of design), research questionnaire, validity and reliability of research finding, confounding factors, strategies to deal with threats to validity, hypothesis testing, sampling, collect data, data collection procedure, step and data collection survey questionnaire, starting questionnaire

Recommended Books:

- Foundation of Clinical Research by Portney LG Walkais MP in 1993, Publisher by Appleton and lauge USA
- A guide to Research Methodology, Biostatistics and Medical writing by college of physicians and surgeons Pakistan by WHO collaboration center
- Health system research project by Corlien M Varkerisser, Indra Pathmanathan, Ann Brownlee in 1993 by International Development Research Center in New Dehli, Singapore.

PMS--308 BIOSTATISTICS Credit Hours: (2+1)

Course Objectives:

- To introduce the student with the significance of bio-statistics, statistics means basic concept, describing and exploring data, normal distribution, sampling distribution and hypothesis testing, basic concept of probability and application of statistics and social research.

Course Contents:

Topics in univariate statistics: basic, Introduction, important terms, senses, method uses for taking census, information collection during census, method of estimating the population of any year, measurement scale, describing and exploring data, measures of central tendency and variability, health statistics, percentiles, quartiles and deciles, normal distribution, the standard normal distribution SND, using tables of SND, measures related to 'Z' scores, sampling distribution and hypothesis testing, basic concepts of probability, data collection (purpose and technique), categorical data and numerical data, application of statistics in social research, percentages, measure of central tendencies, means, Median, Mode, Quartile, decile and percentile

Recommended Books:

- Statistical methods for psychology by howell DC in 7th edition 2013.
- A guide to research methodology, biostatistics and medical writing by college of physicians and surgeons Pakistan by WHO collaboration center
- Reading understanding multivariate statistics giimm LG Yard AD PR, in 1995 publisher American Psychological association
- Ilyas Ansari's community medicine (Text Book) by Ilyas and Ansari 2003 published by Medical division Urdu Bazaar Karachi.

7TH SEMESTER COURSES

- 1. ANESTHESIA FOR G/SURGERY/ORTHOPADEIC AND UROLOGICAL PROCEDURES**
- 2. ANESTHESIA FOR EYE SURGICAL PROCEDURES**
- 3. ANESTHESIA FOR EAR,NOSE, THORAT SURGERY**
- 4. ANESTHESIA FOR OBSTERTIC & PADEATRIC SURGERY**
- 5. ELECTROCARDIOGRAPHY FOR ANESTHETIST**
- 6. EPIDIOMOLOGY**

Course code 418 ANESTHESIA FOR ORTHOPEDICS/UROLOGY AND/GENERAL SURGERY C/hour (2+1)

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of orthopedic, urological and general surgical procedure.

Course contents:

Pre-operative assessment, pre-existing medical problems, physical examination, choice of anesthetic technique, regional anesthesia, intra and post-operative analgesia, special positioning for orthopedic surgery, risk of peripheral nerve injury, blood loss, intra operative hypotension, venous thrombosis, spinal cord injury, tracheal intubation, respiratory consideration, cardiovascular consideration, succinylcholine hyperkalemia, temperature control and monitoring spinal cord integrity, knee arthroscopy, ankle and foot surgery, pediatric orthopedic surgery, tourniquet application, use of methyl methacrylate, fiber optic cystoscopy, transurethral resection of prostate, TURP syndrome, transurethral resection of bladder tumor, nephrectomy, laparoscopic urological surgery, renal transplant

Practical:

- 1) Spinal block preparation
- 2) airway equipment
- 3) Mentoring of aged patient in particular
- 4) Use of defibrillator
- 5) Positioning of patient in prolong surgery
- 6) Blood transfusion

Recommended books:

- Evidence-based Practice of Anesthesiology. Fleisher, A., Lee, J., 3rd edition.
- Text book of Anesthesia. Aitkenhead, Alan, R., 5TH edition.
- Clinical anesthesiology. Morgan & Mikhail's, 5TH edit.
- Anesthesia and co-existing diseases. Roberta L.Hines, 6TH edition.

Course code 424 ANESTHESIA FOR EYE SURGERY 2+1

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of eye surgery and the use of latest technology. These include:

Course contents:

Understanding, Anatomy and physiology of extremes of age, Anatomy of orbit and contents, Physiology of intraocular pressure, Ocular perfusion, Eye reflexes (oculocardiac, oculo-respiratory, oculoemetic), extra ocular muscles, blood vessels, lacrimal apparatus, Local anaesthetic agents for eye surgery, Other drugs for eye surgery, for example, topical agents, vasoconstrictors, mydriatics, miotics, and agents to reduce intraocular pressure. general anesthesia for eye surgery including: examination under anesthesia, Laser eye surgery, Intraocular surgery, extraocular surgery, retinal detachment, Plastic and orbital surgery, emergency eye surgery and use of suxamethonium in penetrating eye injury, Monitoring, Postoperative care, management of nausea and vomiting, principles of regional retro bulbar and peribulbar block and choosing between general and regional anesthesia techniques, Sedation for eye procedures, principles of anesthesia for day, Pediatric considerations.

Practicals:

- 1) Pre-operative preparation of the patient
- 2) Equipment preparation
- 3) Airway devices
- 4) Monitoring devices adjustment
- 5) Labeling of anesthesia drugs

Recommended books:

- Ophthalmic anesthesia. C. Dodds, G. Fanning, C. Kumar.
- Anesthesia for ophthalmic surgery. Mostafa, Morsy, Sobhy.
- Anesthesia and co-existing diseases. Roberta L. Hines, 6TH edition.
- Evidence-based Practice of Anesthesiology. Fleisher, A., Lee, 3rd edition.
- Text book of Anesthesia. Aitkenhead, Alan, R., 5TH edition.
- Clinical anesthesiology. Morgan & Mikhail's, 5TH edit.
- A practice of anesthesiology. Healy, E., J., Thomas, 7th edition.
- Fundamental of Anesthesia. Smith, Tim., Pincock, Colin., line., Ted., Johan., Robert, 3rd edition.

COURSE CODE 423 ANESTHESIA FOR EAR,NOSE,THROT SURGERY 2+1

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of ear, nose and throat (ENT) surgery.

Course contents

Pre-operative airway assessment, examination under anesthesia tonsillectomy and adenoidectomy, including quinsy and postoperative bleeding, micro laryngoscopy, radical head and neck surgery.laryngectomy, pharyngolaryngectomy,Laser surgery,Nasal and sinus operations, Parotid tumor surgery,myringoplasty.,Middle ear surgery,microsurgery of the ear, managing partial airway obstruction including, epiglottitis, foreign bodies, laryngeal tumors, oropharyngeal cysts and abscesses, elective and emergency tracheostomy. Pediatric problems, for example, relating to disease, airway, larynx and craniofacial disorders, post-operative care.

Practicals:

- 1) Preparation of patient
- 2) Preparation of equipment
- 3) Airway management
- 4) Drugs preparation
- 5) Post-op airway management
- 6) Post-op bleeding management in tonsillectomy
- 7) Patient positioning

Recommended books:

- Text book of Anesthesia. Aitkenhead,.Alan,.R,. 5TH edition.
- Clinical anesthesiology. Morgan & Mikhail's,. 5TH edit.
- Anesthesia and co-existing diseases. Roberta L.Hines,.6TH edition.
- Evidence-based Practice of Anesthesiology.Fleisher,.A,.lee,.3rd edition
- Apractice of anesthesiology.Healy,.E,.J,.Thomas,.7th edition.
- Fundamental of Anesthesia. Smith,.Tim,. Pinock,.Colin,. line,.Ted,.Johan ,.Robert,.3rd edition.

COURSE CODE 421 ANESTHESIA FOR OBSTERTIC/PADEATRIC Credit hour 2+1

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of Obstetric and pediatric surgeries.

Course contents:

Difference between normal and pregnant lady, risk for anesthesia, precaution to take, regional anesthesia, epidural analgesia, anesthesia for pre-eclampsia, APGAR score, induction, maintenance and recovery, resuscitation of the newborn, manual removal of placenta, APH, PPH, rupture uterine, ectopic pregnancy, theater setting for pediatric, check list, premedication and intubation, reversal and extubation problem, pain managing.

Practicals:

- 1) Placement of N/G tube
- 2) Positioning in c/section
- 3) Airway management gadgets and its arrangement
- 4) Spinal trolley setting
- 5) Medical gases supply surety
- 6) Adjustment of ventilator as per patient minute ventilation
- 7) I.v cannulation in children
- 8) Selection of ETT size as per patient age
- 9) Safety measure in communicable diseases
- 10) Advance life support drill

Recommended books:

- Obstetric Anesthesia Principles and Practice.
- David, H., Chestnut, Cynthia, A., Wong, Lawrence, C., Tsen, Warwick, D., Nagan, Kee, 5th edition.
- Obstetric Anesthesia. Brenda, A., Buckin, David, R., Gambling, & David, Wlody.
- A practice of anesthesia for infants and children. Cote, J., Charles, Leman, Jerrold & Anderson, Brian, 5th edition.
- Evidence-Based Obstetric Anesthesia. Halpern, H., Stephen, & Douglas, M., Joanne, 3rd edition.
- Handbook of Pediatric Anesthesia. Houck, J., Philipp, Manon, Hache, & Sun, S., Lena,

PMS-495 ELECTROCARDIOGRAPHY FOR ANESTHETISTS Credit Hours: 2(1+1)

Course objectives:

- To describe the basic concepts of EKG
- To recognize the basic electro-physiology using EKG
- To compute different basic technical ECG abnormalities
- To infer different types of arrhythmias
- To identify different heart pathologies on the basis of EKG
- To relate the EKG abnormalities with the heart and lung pathologies

Course Contents:

Conduction problems, heart rhythm, wave abnormalities(P,QRS,T), Atrial and Ventricular Hypertrophy, T Wave Abnormalities, Electrical Axis and Fascicular Block, , Conditions, Arrhythmias, ECG of different Myocardial infarctions, EKG of Different congenital as well as acquired Heart pathologies; Aortic disease, valvular diseases, Pericardial disease, how to use the ECG.

Practical:

Finding heart rate, Rhythm, axis and intervals

Different types of EKG waves and correlation with different heart chambers

Interpretation of different type of arrhythmias

Interpretation of Myocardial infarction

Interpretation of cardiac chamber hypertrophy and enlargements

Interpretation of Cardiac myopathies

Interpretation of valvular pathologies

Interpretation of different aortic pathologies

Recommended Books:

ECG MADE EASY BY JOHAN R.HMAPTON

EKG BY DALE DUBIN 6TH EDITION

ECG MADE EASY BY JHON R 6TH EDITION

RAPID ECG INTERPRETION BY MR. M. GABRIEL KHAN 3RD EDITION

PMS--404 EPIDEMIOLOGY Credit Hours: 2(1+1)

Course Objectives:

- To introduce to the students the know-how of the subject of epidemiology in order to apply the knowledge of the subject regarding the community and community relate disease.

Course Contents:

Introduction to epidemiology, Determinants: Primary and Secondary, Clinical epidemiology, Occupational epidemiology, Importance of epidemiology, Definitions of common terms related to epidemiology, Health indication

Recommended Books:

- Public Health by Ilyas Ansari
- Public Health by J Park

8th Semester Courses

1. RESEARCH PROJECT

2. SEMINAR

**3. ANESTHESIA FOR DENTAL
SURGERY**

4. BIOETHICS

PMS--407 RESEARCH PROJECT Credit Hours: 6(0+6)

Objectives:

- Students will learn some basic research methodology and gain knowledge about research.
- It will hopefully result in some of presentation or publication for the students and will provide a research oriented environment

Course contents:

During last year each student should select a topic of research report with consultation of his/her supervisor and shall prepare and submit research report to Khyber Medical University by the end of last year.

Practical:

A hard copy of research project should submit to examination for degree requirements fulfillment.

PMS--408 SEMINAR Credit Hours:1(1+0)

During last year each student should select a topic of research work with consultation of his/her supervisor and shall present his/her research work through a seminar.

Course code 425 ANESTHESIA FOR DENTAL, MAXILOFICAL, HEAD AND NECK SURGERY 2+1

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of dental, head and neck surgery

Course contents:

Outpatient dental procedures; sedation and general anesthesia, Inpatient dental surgery, Dental procedures on the mentally handicapped, Dental procedures on patients with bleeding disorders, Oral surgery, Fractured jaw, Maxillary fractures according to the Le Fort, tracheostomy classification, Dental sepsis, Pre-operative airway assessment. Management of anesthesia for major maxillofacial surgery, which may involve prolonged anesthesia, major blood loss, hypothermia and multiple procedures, Management of anesthesia for facial trauma: emergency and semi-elective, including fractured jaw and maxilla Management of anesthesia for cancer, plastic and cosmetic surgery on the face, head and neck, including surgery for cleft palate. Thyroid surgery, Stabilization of thyroid and parathyroid disorders, post-op, thyroid storm management, Sedation for head and neck procedures, Post-operative care.

PRACTICALS:

1. Nasal intubation
2. Observation of tracheostomy
3. Airway management in maxillo facial patient
4. Post- op monitoring and airway care
5. Use of equipment in dental anesthesia
6. Local block observation

RECOMMENDED BOOKS:

- Anesthesia for oral and maxillofacial surgery. shaw, Ian, kumar, chandra, & Dodds, christopher, 3rd edition.
- Handbook of local anesthesia. Malamed, F, stanely, 6th edition.
- Clinical anesthesiology. Morgan & Mikhail's, 5TH edit.
- Text book of Anesthesia. Aitkenhead, Alan, R, 5TH edition

PMS—410 BIOETHICS Credit Hours 2(2+0)

Course Objectives:

- To introduced the students with medical ethics, their behavior with patients and medical Staff.

Course Contents:

Ethical conduct, relationship with patient, surgeon, physician, nurse, social workers and co-workers, preparation and uses of records, report, physical plant, equipments. The implementation of and confirmation to the rules of professional context and understanding, the paramedic liability and obligations in the case of medico legal action, a wider knowledge of ethics relating to current social and medical policy in the paramedic society as a professional association, the role of international health agencies such as world health organization.

Recommended Books:

- Medical ethic by Dr. Mehmood Alam in 2006 by Health Department NWFP