

CURRICULAMFORBS ANESTHESIA

INSTITUTE OF PARAMEDICAL SCIENCES KHYBER MEDICAL UNIVERSITY PESHAWAR

INTRODUCTION

The BSA anesthesia course is a four-year degree program 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 healthcare provider (Anesthesiologist, Surgeon). On completion of the course, they will play a key role in determining the quality of healthcare facilities in the province, country, and across the globe. With advanced training in the latest technology, these students will be able to open the door to 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.

FRAMEWORK FOR BS ANESTHESIA

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

SEMESTERWISE SUBJECTS BS ANESTHESIA

Semester	Coursecode	Subject	Credit hours
1 st	PMS-601	MEDICAL BIOCHEMISTRY-I	4(3+1)
	PMS-602	HUMANPHYSIOLOGY-I	4(3+1)
	PMS-603	HUMAN ANATOMY-I	4(3+1)
	PMS-604	ENGLISH-I	2(2+0)
	PMS-605	PAK STUDIES	2(2+0)
	PMS-606	COMPUTER SKILLS	2(2+0)
		Total credit hours	18
2 nd	PMS-607	MEDICAL BIOCHEMISTRY-II	4(3+1)
	PMS-608	HUMAN PHYSIOLOGY-II	4(3+1)
	PMS-609	HUMANANATOMY-II	4(3+1)
	PMS-610	ENGLISH-II	2(2+0)
	PMS-611	ISLAMIC STUDIES	2(2+0)
			Total Credit Hour
3 rd	ANS-601	ANATOMYRELATEDTOANESTHESIA	3(2+1)
	PMS-612	GENERALPATHOLOGY-1	3(2+1)
	PMS-614	PHARMACOLOGY-1	3(2+1)
	PMS-613	MEDICALMICROBIOLOGY-I	3(2+1)
	MLT-601	HEMATOLOGY-I	3(2+1)
	PMS-615	COMMUNICATION SKILL	2(1+1)
		Total Credit Hour	17
4 th	ANS-602	PHYSIOLOGY RELATED TO ANESTHESIA	3(2+1)
	ANS-603	PHYSICSRELATEDTOANESTHESIA	3(2+1)
	ANS-604	COMMUNITY MEDICINE	2(2+0)
	MLT-604	HEMATALOLOGY II	3(2+1)
	PMS-617	PATHOLOGY-II	3(2+1)
	PMS-616	PHARMACOLOGY-II	3(2+1)
		Total Credit Hour	17
5 th	ANS-605	PHARMACOLOGY RELATED TO ANESTHESIA	3(2+1)
	ANS-606	ANESTHESIAEQUIPMENT	3(2+1)
	ANS-607	HISTROY TAKEING PRE-OPERATIVE ASSESMENT& MEDICATIONPOST-OPE CARE	3(2+1)
	ANS-608	ANESTHESIAAND CO-EXISTING DISEASES	3(2+1)
	ANS-609	CRITICALCARE	3(2+1)
	ANS-610	LEADERSHIPAND MANAGEMNT	2(2+0)
		Total Credit Hour	17

6 th	ANS-611	DIFFERENT TYPES OF ANESTHESIA	3(2+1)
	ANS-612	ANESTHESIA RELATED COMPLICATIONS & THEIR MANAGEMENT	3(2+1)
	ANS-613	ANESTHESIA FOR CARDIOTHORIC SURGERY	3(2+1)
	ANS-614	ANESTHESIA FOR NEURO, EMERGENCY AND GERIATRIC SURGERY	3(2+1)
	PMS-621	RESEARCH METHODOLOGY	3(2+1)
	PMS-622	BIOSTATISTICS	3(2+1)
		Total credit hours	18
7 th	ANS-615	ANESTHESIA FOR G/SURGERY /ORTHOPAEDIC AND UROLOGICAL PROCEDURES	3(2+1)
	ANS-616	ANESTHESIA FOR EYE SURGICAL PROCEDURES	3(2+1)
	ANS-617	ANESTHESIA FOR EAR, NOSE, THORACIC SURGERY	3(2+1)
	ANS-618	ANESTHESIA FOR OBSTETRIC & PEDIATRIC SURGERY	3(2+1)
	ANS-619	ELECTROCARDIOGRAPH FOR ANESTHETIST	3(2+1)
	PMS-623	EPIDEMIOLOGY	2(2+0)
		Total credit hours	17
8 th	PMS-626	RESEARCH PROJECT	6(6)
	PMS-627	SEMINAR	1(1)
	ANS-620	ANESTHESIA FOR DENTAL, MAXILLOFACIAL, HEAD AND NECK SURGERY	3(2+1)
	PMS-625	BIOETHICS	2(2+0)
		Total credit hours	12

1stSEMESTERCOURSES	COURSE CODE
1.MEDICAL BIOCHEMISTRY-I	PMS-601
2.HUMANPHYSIOLOGY-I	PMS-602
3.HUMANANATOMY-I	PMS-603
4.ENGLISH-I	PMS-604
5.PAKSTUDIES	PMS-605
6.COMPUTERSKILLS	PMS-606

Course objectives:

After successful completion of this course, students will be able to,

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

Course contents:

Biochemical composition and functions of the cell; 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 Medical 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 Medical Biochemistry Robert K. Murray, Daryl K. Granner 28th edition 2009
- Medical Biochemistry Mushtaq Ahmad vol. I and II 8th edition 2013

Course Objectives:

After successful completion of this course, students will be able to,

- Describe the basic concepts of physiology beginning from the cell organization to organ system function.
- Discuss the organization of cell, tissue, organ and system with respect to their functions.
- Explain 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 Tissues, 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. Blood cells count (RBCs, WBCs , Platelets, Reticulocytes)

Recommended Books:

- Essentials of Medical Physiology K Sembulingam, PremaSembulingam 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

Course Objectives:

After successful completion of this course, students will be able to,

- Identify the principle structures of tissues, organs and systems.
- Discuss the different concepts and terms of general anatomy including skeleton and Musculo skeletal system.
- Explain the anatomy of Thorax, Abdomen and pelvis.

Course contents:

General Anatomy; Descriptive Anatomic terms, Basic structures, Musculo skeletal system (Axial and Appendicular), Different bones of the human body and their surface markings, General concepts, parts , classifications of bones, Structural, Regional and functional classification of joints, Characteristics, Classifications, Movements of synovial joints. Muscular System (skeletal, Cardiac, smooth)**Thoracic wall:** Structure of the anterior thoracic wall, Muscles of thorax, Diaphragm **Thoracic cavity:** Mediastinum, Trachea, lungs, pleura , bronchi, blood supply and lymphatics, Heart and thoracic vessels **Abdominal wall:** Skin, nerve and blood supply, Muscles of anterior abdominal wall, Inguinal canal **Abdominal cavity:** General Arrangement of the Abdominal Visceras, Peritoneum, Omenta, mesenteries, GIT and its blood supply, Accessory Organs (Liver, Spleen, Gall bladder, Pancreas), Genitourinary System (Kidneys, Ureters) **The pelvic wall:** Anterior, posterior wall, diaphragm. **Pelvic cavity:** Uterus, Ovaries, Fallopian tubes, urinary bladder, Male genital organs, Female genital organs, Muscles of pelvic region, blood supply, nerve supply.

Practicals:

1. Study Axial, Appendicular skeleton and musculoskeletal system on human skeletal models.
2. Study and identification of the anatomy of Thorax, Abdomen and Pelvis through:
3. Human Models
4. Video demonstrations

Recommended Books:

- Clinical Anatomy (By regions) 9th edition, Richard S. Snell
- Netter Atlas of human anatomy 5th Edition Saunders.
- Gray's Anatomy for students 2nd Edition Drake VogalMitcell.

Course Objective:

After successful completion of this course, students will be able to,

- Compose a well-constructed essay that develops a clearly defined claim of interpretation which is supported by close textual reading.
- Utilize literary terminology, critical methods, and various lenses of interpretation in their writing.
- Apply the rules of English grammar.
- Adhere to the formatting and documenting conventions of our discipline.

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-605

Pakistan Studies Credit Hours: 2(2+0)

Course Objectives:

After successful completion of this course, students will be able to,

- Develop vision of Historical Perspective, Government, Politics, Contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.
- Inculcate patriotism in the hearts of students so that they may become a good citizen.

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

Recommended Books:

- 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.

Course Objectives

After successful completion of this course, students will be able to,

- Use technology ethically, safely, securely, and legally.
- Identify and analyze computer hardware, software, and network components.
- Design basic business web pages using current HTML/CSS coding standards.
- Install, configure, and remove software and hardware.

Course Contents:

INTRODUCTION TO COMPUTER: I/O devices – memories, Networking – LAN,WAN,MAN (only basic ideas), TYPING TEXT IN MS WORD: Manipulating text, Formatting text - using different font sizes, bold, italics, Bullets and numbering, Pictures, file insertion, Aligning the text and justify, Choosing paper size - Adjusting margins, Header and footer, inserting page No s in a document, Printing a file with options, Using spell check and grammar, CREATING TABLE IN MS EXCEL: Cell editing-Using formulas and functions, Manipulating data with excel, PREPARING NEW SLIDES USING MS- POWER POINT: Inserting slides – Slide transition and animation, Using templates, Different text and font sizes –Slides with sounds – Inserting clips arts, pictures, tables and graphs- Presenting using wizards, INTRODUCTION TO INTERNET Using search engine – Google search – Exploring the next using Internet Explorer and Navigator and Download of files and images – E-mail ID creation, Sending messages- Attaching files.

Practicals:

- Typing a text and aligning the text with different format using MS –Word
- Inserting a table with proper alignment and using MS-Word
- Create mail merge document using MS-Word to prepare greetings for 10 friends
- Preparing a Slide show with transition, animation and sound effect using MS-Power point
- Creating a worksheet using MS-Excel with data and use of functions
- Using MS-Excel prepare a worksheet with text, date time and data
- Preparing a chart and pie diagrams using MS-Excel
- Internet for searching, uploading files, downloading files and creating e-mail ID
- C language writing programs using functions

Recommended Books:

- CAMBRIDGE IGCSE® COMPUTER SCIENCE STUDY AND REVISION GUIDE (pb)2016
- Computer science by Muhammad Ashraf, edition 1st 2010

2nd SEMESTER COURSES	COURSE CODE
1. MEDICAL BIOCHEMISTRY-II	PMS-607
2. HUMAN PHYSIOLOGY-II	PMS-608
3. HUMAN ANATOMY-II	PMS-609
4. ENGLISH-II	PMS-610
5. ISLAMIC STUDIES	PMS-611

PMS-607 Medical Biochemistry-II Credit hours 4(3+1)

After successful completion of this course, students will be able to,

- Describe the synthesis of proteins, lipids, nucleic acids, carbohydrates and their role in metabolic pathways along with their regulation.
- Discuss the clinical role of enzymes in human being.
- Interpret and apply nutritional concepts to evaluate and improve the nutritional health of individuals with medical conditions.

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.

Practicals:

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

Recommended Books:

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

Course Objectives:

After successful completion of this course, students will be able to,

- Demonstrate a systematic and coherent knowledge of the physiological functioning of the central nervous system, special senses (CNS & SS), cardiovascular system and respiratory system.
- Describe the formation of the formed element components of blood.
- Identify the components and function of the lymphatic system and discuss the role of the innate immune response against pathogens.

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 , haematopoiesis, 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, PremaSembulingam Sixth Edition 2013
- Guyton And Hall Textbook Of Medical Physiology John E. Hall, Arthur C. Guyton Professor and Chair 2006

Course Objectives:

After successful completion of this course, students will be able to,

- Identify bones of the upper limb and bony landmarks that articulate at each joint with all muscular compartments of the upper limb.
- Discuss bones of the lower limb and bony landmarks that articulate at each joint with all muscular compartments of the lower limb and identify these structures on radiographic images.
- Describe the topographical and functional anatomy of the head and neck, in particular the arrangement, relations and structure of the major skeletal, muscular and neurovascular components of the head and neck.

Course contents:

The upper limb Bones of shoulder girdle and Arm, Muscles, Axilla, Brachial plexus, Cubital fossa, the forearm, hand bones, Blood supply, Nerve supply, lymphatics **The lower limb** Fascia, Bones of the thigh, leg and foot, Muscles, Femoral triangle, Blood, Nerve, Lymphatic supply **Head and neck** Skull and facial bones, Cranial nerves, cranial cavity, Scalp, Meninges, Brain, Orbit, Muscles of the Neck, arterial and venous supply of the head and neck, The autonomic nervous system in the head and neck, Salivary Glands

Practicals:

Identification of the structures and the anatomy of Upper limb, Lower limb, Head and Neck through:

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

Recommended Books:

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

Course Objectives:

After successful completion of this course, students will be able to,

- Develop writing, reading and listening skills.
- Demonstrate integrative and independent thinking, originality, imagination, experimentation, problem solving, or risk taking in thought, expression, or intellectual engagement.
- Participate in discussions by listening to others' perspectives, asking productive questions, and articulating original ideas.

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 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 1986. ISBN 0 19 431350 6.

CourseObjectives:

After successful completion of this course, students will be able to,

- Recognize basic concept of Islam (faith, pillars and systems etc.) and express their impact on society.
- Present Islam as complete code of life and demonstrate understanding of Islamic Ethics.
- Demonstrate the role of a medical professional in Islam.

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

3rdSemesterCourses	COURSECODE
1.GENERALPATHOLOGY-I	PMS-612
2.PHARMACOLOGY-I	PMS-614
3.ANATOMYRELATEDTO ANESTHESIA	ANS-601
4.HEMATOLOGY-I	MLT-601
5.COMMUNICATIONSKILLS	PMS-615
6.MEDICALMICROBIOLOGY-I (Non MLTstudents)	PMS-613

Course Objectives

After successful completion of this course, students will be able to,

- Specify the abnormalities of cell growth and differentiation.
- Describe cellular responses to stress and noxious stimuli and inflammation.
- Discuss cell injury, cell death and mechanisms involved in wound healing.
- Explain the hemodynamic disorders and neoplasia.

Course Contents

Cell Injury & adaptation Cell injury, Cellular adaptation

Inflammation Acute Inflammation, Chronic Inflammation

Cell Repair & Wound Healing Regeneration & Repair, Healing Factors affecting Healing

Hemodynamic Disorders Define & classify the terms, Edema, Hemorrhage, Thrombosis, Embolism, Infarction & Hyperemia, Shock, compensatory mechanism of shock, possible consequences of thrombosis & difference between arterial & venous emboli

Neoplasia Dysplasia & Neoplasia Difference between benign & malignant neoplasm, etiological factors for Neoplasia, different modes of metastasis

Practicals

- Blood culture
- Urine & stool examination
- Gram staining
- Neoplasia: Characteristics of malignancy

Recommended Books

- Robbins and Cotran Pathologic Basis of Disease, Professional Edition, 8th Edition

Course Objectives

After successful completion of this course, students will be able to,

- Describe common terms related to pharmacology and drug therapy.
- Identify a range of drugs used in medicine and discuss their mechanisms of action.
- Report the clinical applications, side effects and toxicities of drugs used in medicine.

Course Contents:

Introduction to Pharmacology, Pharmacokinetics, Pharmacodynamics ,Adverse effects of drugs, Classification of drugs, Drugs affecting the Autonomic Nervous System, NSAIDS, Opioids, Drugs Affecting Endocrine system (Corticosteroids, Thyroid and anti Thyroid Gastrointestinal Drugs (PPIs, Blockers and antacids) , Antihistamines, Anesthetics (General and Local Anesthetics)

Practicals:

- Routes of drug administration
- Introduction to drug dosage form
- Study of the action of drugs (Atropine) on the rabbit's eye
- Dose-Response Curves
- Effect of adrenaline on pulse rate
- Effect of beta blockers on heart rate after exercise
- Preparation of Sulfur ointment and pilocarpine drops
- Prescription writing

Recommended Books:

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

ANS-601**ANATOMY RELATED TO ANESTHESIA****Credit hour****2+1 Course objective:**

- 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,

Practical's:

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 edition.

Course Objectives:

By the end of this semester the students of BSc Technology 3rd semester will be able to

- Discuss basic concepts in Hematology and acquire skill in practical work to produce students steeped in knowledge of Hematology
- Interpret the test result of the basic hematological procedures for accurate diagnosis and patient's monitoring

Course Content:

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 extrauterine), factors governing hematopoiesis, Erythropoiesis, different stages and factors effecting on erythropoiesis, Granulopoiesis, different stages and factors effecting on granulopoiesis, Introduction to hemoglobin, structure, synthesis and function of hemoglobin, complete blood count (CBC) and its importance, Morphology of red blood cells and white blood cells and its importance in various hematological disorders, Introduction to anemia its classification, 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, Eosinophilia, condition related to eosinophilia, Monocytosis, condition related to monocytosis, Lymphocytosis, condition related to lymphocytosis, 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 reticulocyte count
6. To determine the esr
7. Determine bleeding time; prothrombin time; activated partial thromboplastin time

Books:

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

Course Objectives

After successful completion of this 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 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, etc

Public Speaking and Presentation skills, Effective public presentation skills, Audience analysis, Effective argumentation skills, Interview skills

Recommended books:

- Interpersonal Communication Paperback by Kory Floyd
- Reading into Writing 1: English for Academic Purposes: A Handbook-Workbook for College Freshman English (Mass Market Paperback) by Concepcion D. Dadufalza (Lecture Notes/Presentations)

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, structure and function of prokaryotic cell, difference between prokaryotic and eukaryotic cell, bacterial growth, normal microbial flora of human body, mechanism of bacterial pathogenesis, host-parasite interaction, Immune response to infection, common bacterial pathogen prevailing in Pakistan, introduction of fungi, fungal characteristics, 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.

4 th SEMESTER COURSES	Course code
1. PHARMACOLOGY-II	PMS-616
2. PATHOLOGY-II	PMS-617
3. PHYSIOLOGY RELATED TO ANESTHESIA	ANS-602
4. PHYSICS RELATED TO ANESTHESIA	ANS-603
5. COMMUNITY MEDICINE	ANS-604
6. HEMATOLOGY II (Non MLT Students)	MLT-604

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, antianginal drugs, Anti-Hyperlipidemic drugs, Blood drugs (Anticoagulants), Diuretics, Chemotherapeutic drugs ([Anti-protozoal, Anti-Malarial], Anti-Fungal, Anthelmintic), Antibiotics (Penicillin's, cephalosporin's, macrolides, aminoglycosides, fluoroquinolones), Drugs acting on Respiratory system (Asthma).

Practical:

1. Routes of drug administration
2. Dose-Response Curves
3. Affect of adrenaline on pulse rate
4. Affect of beta blocker 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 of Sulfurointment
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 text book of pharmacology (Reference Book) by Bertram Katzung 8th Edition, Published by Appleton. Dec 2007.

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

ANS-603**PHYSICS RELATED TO ANESTHESIA****Credit hour: (3+1) Course Objective**

- 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

Practicals:

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

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.

Course objective:

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

Course Contents:

Basic definition, primary healthcare, 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.

MLT--604	HematologyII(Non-MLT)	Credit
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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 contents:

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, folate 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, Kell blood group system, Duffy blood group system, donor selection criteria, phlebotomy of donor, blood products, preparation, storage and its importance, hemovigilance in blood bank, crossmatch, types of crossmatch, procedure and its importance, blood grouping and its importance, Coombs test, types and importance, introduction to hemolytic disease of newborn, types, pathophysiology, diagnosis and management, hemolytic transfusion reactions and management.

Practical:

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. DuTest

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

5THSEMESTERCOURSES	Coursecode
1.PHARMACOLOGY RELATED TO ANESTHESIA	ANS-605
2. ANESTHESIAEQUIPMENT	ANS-606
3.HISTROY TAKEING PRE-OPERATIVE ASSESMENT & MEDICATION POST-OPE CARE	ANS-607
4.ANESTHESIA AND CO-EXISTING DISEASES	ANS-608
5. CRITICAL CARE	ANS-609
6. LEADERSHIPAND MANAGEMNT	ANS-610

ANS-605**PHARMACOLOGY RELATED TO ANESTHESIA****Credit hour: (2+1)****Course objective:**

- 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.
- Textbook 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 objective:

- 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, endotracheal tubes (ETT), airways (oral and nasal), suction machine, infusion pump, reservoir bags, resuscitator bags, thermometer, sphygmometer, stethoscope, oxygen purity meter, Operation 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. Sakai, Bahalal, & Stacey, Simon, 3rd edition.
- Clinical anesthesia. Morgan & Mikhail's, 5th edition.
- Textbook of Anesthesia. Aitkenhead, Alan, R., 5th edition.

ANS-607 PRE-OPERATIVE HISTORY, PREPARATION&POST-OP CARE C/Hr:(2+1)**Course objective:**

- Students are expected to understand various health problems and their negative impacts on the practice of safe anesthesia.
- To demonstrate 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, predicating of pre-operative morbidity and mortality, predicating of specific events arise inter-operatively, patient preparation, anaesthesia 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. Proof equipment and anaesthesia 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 & Management. Sweitzer, Bobbie, Jean, 2nd edition.
- Evidence-based Practice of Anesthesiology. Fleisher, A, Lee, 3rd edition.
- Textbook 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.

ANS-608**ANESTHESIA AND COEXISTING DISEASES****Credit Hour: 2+1****Course objective:**

- Students are expected to understand common diseases and its negative impacts in anesthesia practice.
- 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, shifted to critical care), 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 disturbed data in various renal diseases.
6. Collection of data relevant to liver abnormal Medical Biochemistry

Recommended books:

- Anesthesia and co-existing diseases. Robertal. hines, .6th edition.
- Evidence-based practice of anesthesiology. fleisher, .a., .lee, .3rd edition.
- Textbook 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, .Pinock, .colin, .Line, .ted, .johan, .robert, .3rd edition.

- Students are expected to understand various critical cardiovascular situations, categorize the patient, access 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 and 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, 4th edition.
- Principles of critical care. Farokh, Erach, Udawadia, 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 Ltd.
- Rosen emergency medicine manual. Adams, Barsan, Birn, Danzl, 5th edition.

ANS-610**LEADERSHIP AND MANAGEMENT****Credit hour:****(2+0)Course objective:**

- 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 of 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, commutation, Controlling, span of control, factor limiting effective control, supermanagement, 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. Suzan 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.

6THSEMESTERCOURSES	Course code
1.DIFFERENTTYPES OFANESTHEISA	ANS-611
2.ANESTHESIA RELATED COMPLICATIONS &THEIRMANAGEMNT	ANS-612
3.ANESTHESIA FOR CARDIOTHORIC SURGERY	ANS-613
4.ANESTHESIA FOR NEURO,EMERGENCY AND GERIATRIC SURGERY	ANS-614
5.RESEARCHMETHODOLOGY	PMS-621
6.BIOSTATICS	PMS-622

ANS-611**DIFFERENT TYPES OF ANESTHESIA****Credit Hour(2+1)****Course objective:**

- 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 intubation, total intravenous anesthesia, anesthesia with ketamine, subarachnoid 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, supraclavicular block, regional anesthesia for thorax, field block, surface anesthesia

Practical's:

- 1) Understanding various spinal needles
- 2) Use of local anesthetic agents and quantity required as per the need
- 3) Enlist the complications observed by the candidate during their clinical rotation
- 4) Expert in the reliability of different instruments 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.
- Textbook 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.

ANS-612 ANESTHESIA COMPLICATIONS AND THEIR MANAGEMENT credit H (2+1)**Course objective:**

- Students are expected to understand various complications and unwanted events that 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, hypercapnia, 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 esterase inhibitors.

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 anesthesia. Morgan & Mikhail's, 5th edit.
- Textbook 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.
- Fundamentals of Anesthesia. Smith, Tim, Pincock, Colin, Line, Ted, Johanson, Robert, 3rd edition

ANS-613**ANESTHESIA FOR CARDIOTHORACIC SURGERY****Credit Hour 2+1****Course objective:**

- Students are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anesthesia management of cardiothoracic 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, checklist, 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. Cardiac 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 anesthetic circuit

Recommended books:

- Cardiovascular and thoracic anesthesia. Gothard, John, Andrea, Kelleher & Haxby, Eliuabeth, 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.

ANS-614 ANESTHESIA FOR NEUROSURGERY/EMERGENCY/GERIATRIC C/Hour2+1**Course objective:**

- 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:

Glasgow coma scale, premedication, investigation, checklist of equipment, induction of anesthesia, use of reinforced ETT, positioning 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.

Course Objectives:

After successful completion of this course, students will be able to,

- Recognize the basic concepts of research and the research process.
- Develop understanding on various kinds of research, objectives of doing research, research designs and sampling.
- Conduct research work and formulating research synopsis and report.

Course Contents:

Introduction to research (in simple term and as scientific term), concept of research, why done research, advantage and scope of research, identification of research needs and its qualities, Types of research; Qualitative, Quantitative and their subtypes, Research process Introduction (Deciding, formulating research questions, planning, conduct of study, data collection, processing and analysis, Research writing and reporting), Literature review (What, why, where from, how and qualities of good literature and its use), Writing a research problem/question and selection of the title of study, Identification of various research variables, Hypothesis its types, formulation and testing of hypothesis, Research study designs used in qualitative and quantitative studies, Designing of data collection tools/questionnaires, Selection of appropriate sampling technique in various study designs, Concept of validity and reliability, Research proposal writing, Ethical principles of Research and their examples to apply those principles, Data collection and processing/displaying techniques, Writing of research report (Chapters in research report/thesis, Outline/Abstract of research, Referencing and Bibliography)

Practical Work:

- Literature Search
- Survey conduct
- Citation and Referencing
- Proposal writing
- Data collection and displaying

Recommended Books:

- Research Methodology by Ranjit Kumar 3rd Edition
- Foundation of Clinical Research by Portney LG Walkais MPin 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 MVarkerisser, Indra Pathmanathan, Ann Brownlee in 1993 by International Development Research Center in New Dehli, Singapore.

Course objectives:

After successful completion of this course, students will be able to,

- State the principal concepts about biostatistics; collect data relating to variable/variables.
- Examine and calculate descriptive statistics from collected data.
- Interpret data via binomial distribution and the concept of sampling.
- Apply hypothesis testing via some of the statistical distributions.

Course Contents:

Introduction to Biostatistics and its types; Descriptive and inferential statistics, Measure of central tendency, Measure of dispersion, Statistical data, Presentation of Data by Graphs, Data and its types, Data collection tools, Data analysis tools Health Related Data, Presentation of quantitative data, The concept of sampling, types and methods of sample, sampled distribution, errors of sampling, Variable and its types, Tests used in biostatistics their use and interpretation (t-tests, Chi-square ANOVA, Regression and correlation) Hypothesis formulation and testing on the basis of statistics and statistical tests, Sample and population, Basic considerations in sampling, random sampling, stratified random sampling, cluster sampling, systematic sampling, determination of sample size, elimination of sampling bias, two types of errors, acceptance and rejection Regions, Two sided and one sided tests, general steps in hypothesis testing, test about means, confidence interval for mean, Preparing data analysis by various software, Use of SPSS

Practicals

- Manual calculation related to measure of central tendency and measure of Dispersion
- Defining variables in SPSS
- Entry of data in SPSS
- Analysis of data in SPSS

Recommended Books:

- A guide to research methodology, biostatistics and medical writing by college of physicians and surgeons Pakistan by WHO collaboration center
- Reading understanding multivariate statistics Gimm LG Yard AD PR, publisher American Psychological Association
- Ilyas Ansari's community medicine (Text Book) by Ilyas and Ansari 2003 published by Medical division Urdu Bazaar Karachi

7THSEMESTER COURSES	Course code
1.ANESTHESIAFOR G/SURGERY/ORTHOPAEDIC ANDUROLOGICAL PROCEDURES	ANS-615
2.ANESTHESIAFOR EYESURGICALPROCEDURES	ANS-616
3.ANESTHESIAFOR EAR,NOSE,THORATSURGERY	ANS-617
4.ANESTHESIAFOR OBSTERTIC&PADEATRIC SURGERY	ANS-618
5.ELECTROCARDIOGRAPHFOR ANESTHETIST	ANS-619
6.EPIDIOMOLOGY	PMS-623

ANS-615 ANESTHESIA FOR ORTHOPEDICS/UROLOGY AND/GENERAL SURGERY (2+1)**Course objective:**

- 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, intraoperative 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 methylmethacrylate, fiberoptic cystoscopy, transurethral resection of prostate, TURP syndrome, transurethral resection of bladder tumor, nephrectomy, laparoscopic urological surgery, renal transplant

Practicals:

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

Recommended books:

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

ANS-616**ANESTHESIA FOREYE SURGERY****credit hour(2+1) Course objective:**

- 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 (oculo-cardiac, oculo-respiratory, oculo-emetic), extraocular muscles, blood vessels, lacrimal apparatus, Local anesthetic 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, extra-ocular 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 retrobulbar 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.
- Textbook 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.

ANS-617**ANESTHESIA FOREAR, NOSE, THROAT SURGERY****credit H(2+1)****Course objective:**

- 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, microlaryngoscopy, radical head and neck surgery. laryngectomy, pharyngolaryngectomy, Laser surgery, Nasal and sinus operations, Parotid tumors 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:

- Textbook of Anesthesia. Aitkenhead, Alan, 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
- A practice of anesthesiology. Healy, E., J., Thomas, 7th edition.
- Fundamental of Anesthesia. Smith, Tim, Pincock, Colin, Line, Ted, Johan, Robert, 3rd edition.

ANS-618 ANESTHESIA FOR OBSTETRIC AND PEDIATRIC SURGERY Credit hour 2+1**Course objective:**

- 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, anesthesia for non-obstetric during pregnancy, 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 uterus, ectopic pregnancy, theater setting for pediatric, checklist, 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, C., Wong, L., Lawrence, C., Tsen, Warwick, D., Nagan, K., 5th edition.
- Obstetric Anesthesia. Brenda, A., Buckin, D., R., Gambling, & David, W. L.,
- A practice of anesthesia for infants and children. Cote, J., Charles, L., Leman, J., Jerrold & Anderson, B., 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,

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:

1. Finding heart rate, Rhythm, axis and intervals
2. Different types of EKG waves and correlation with different heart chambers
3. Interpretation of different type of arrhythmias
4. Interpretation of Myocardial infarction
5. Interpretation of cardiac chamber hypertrophy and enlargements
6. Interpretation of Cardiac myopathies
7. Interpretation of valvular pathologies
8. 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

Course objectives:

After studying this course the students will be able to:

- Explain epidemiological terminologies
- Apply the knowledge to calculate disease risk, prevalence and incidence
- Select and choose an appropriate study design in research
- Explain confounding and Biases in studies
- Appraise SWOT analysis

Course Contents:

Introduction to Epidemiology and basic terms used in Epidemiology, Measures of Disease Occurrence; Incidence and Prevalence, Incidence, Rates and its types, Dynamic of disease transmission, Measurement of disease frequency, risk, rate and proportion, Calculation of: Prevalence, Incidence, Duration, Mortality and Morbidity, Study Design Options, Research study Designs, Case Control Study, Cohort Study, Experimental Study, RCT, Meta-analysis and systematic review, The Cross-Sectional Study, Case-Reports, Sources of Error; Confounding and Biases, Odds ratio and relative risk, SWOT analysis, Reliability of tests by using Sensitivity and specificity

Practical's:

1. Calculation of Sensitivity and specificity
2. Calculation of Incidence and prevalence
3. Finding risk of disease, rate and frequency
4. SWOT analysis

Recommended Books:

- 1. An Introduction to Epidemiology for Health Professionals
- Epidemiology by Leon Gordis 5th Edition

8th Semester Courses	Course code
1.RESEARCHPROJECT	PMS-626
2.SEMINAR	PMS-627
3.ANESTHESIAFOR DENTALSURGERY	ANS-620
4.BIOETHICS	PMS-625

Course 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—627

SEMINAR

Hours:1(1+0)

Course objective:

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.

ANS-620 ANESTHESIA FOR DENTAL, MAXILLOFACIAL, HEAD AND NECK SURGERY C/H2+1**Course objective**

- 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 LeFort, 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 maxillofacial 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., Stanley, 6th edition.
- Clinical anesthesiology. Morgan & Mikhail's, 5th edit.
- Textbook of Anesthesia. Aitkenhead, Alan, R., 5th edition

Course Objectives

After successful completion of this course, students will be able to,

- Identify ethical issues in medicine, health care and life sciences.
- Describe rational justification for ethical decisions.
- Practice the ethical principles of the Universal Declaration on Bioethics and Human Rights.
- Recognize and distinguish an ethical issue from other issues.

Course Contents:

Introduction to bioethics, ethical principles, autonomy , informed consent, intentional non-disclosure , patient self- determination act, the health insurance portability and accountability act of 1996 (HIPAA) privacy and security rules, non-maleficence, slippery slope arguments, beneficence, paternalism, justice, social justice, the patient protection and affordable care act, professional patient relationship, unavoidable trust, human dignity , patient advocacy, moral suffering, ethical dilemmas.

Recommended Books:

- Introduction to bioethics and ethical decision making by Karen L. Rich (chapter 2) 2015