



CURRICULUM

BS Surgical Technology

**WAZIR MUHAMMAD INSTITUTE OF ALLIED
HEALT SCIENCES**

GANDHARA UNIVERSITY PESHAWAR

SEMESTER WISE SUBJECTS BS SURGICAL TECHNOLOGY

FIRST SEMESTER (COMMON FOR ALL THE TECHNOLOGIES)		
Code	Subject	Credits
WMI-601	Anatomy-I	3+1
WMI-602	Biochemistry-I	3+1
WMI-603	Physiology-I	3+1
WMI-604	Pak Studies	2+0
WMI-605	English	2+0
WMI-606	Computer Skills	2+0
Total Semester Credit Hour		18
SECOND SEMESTER (COMMON FOR ALL THE TECHNOLOGIES)		
WMI-607	Anatomy-II	3+1
WMI-608	Biochemistry-II	3+1
WMI-609	Physiology-II	3+1
WMI-610	Islamic studies	2+0
WMI-611	Communication Skills	2+0
Total Semester Credit Hour		14
THIRD SEMESTER		
SUT-601	Surgical Instruments /Equipments	2+1
WMI-612	General Pathology-I	2+1
WMI-613	General Pharmacology-I	2+1
WMI-614	Behavioral Sciences	2+0
WMI-615	Bioethics	2+0
WMI-636	Haematology-I	2+1
WMI-637	Medical Microbiology-I	2+1
Total Semester Credit Hour		18
FORTH SEMESTER		
SUT-602	Surgical Setup and Positioning	2+1
SUT-603	Sterilization and Disinfection	2+0
WMI-616	General Pathology – II	2+1
WMI-617	General Pharmacology – II	2+1
WMI-638	Medical Microbiology-II	2+1
WMI-642	Diagnostic Imaging	1+1
Total Semester Credit Hour		16
FIFTH SEMESTER		
SUT-604	Surgical Emergency – I	2+1
SUT-605	Surgical IC – 1	2+1
WMI-606	Surgical First Assistance	2+1
WMI-610	Quality Assurance and Biosafety	1+0
WMI-640	Anesthesia Equipment	2+1
WMI-643	General Surgery	2+1
Total Semester Credit Hour		17
SIXTH SEMESTER		
SUT-607	Diagnostic Procedure	1+1
SUT-608	Clinical Operative General Surgery	2+1
SUT-609	Clinical Operative Gynecology Obstetrics	2+1
SUT-611	Per Operative Care	2+1
WMI-630	Biostatistics	2+1
WMI-631	Research Methodology	2+1
Total Semester Credit Hour		17

SEVENTH SEMESTER		
SUT-613	Clinical Operative Pediatric Surgery	2+1
SUT-614	Clinical Operative Neuro Surgery	2+1
SUT-615	Clinical and operative Endoscopy, Robotic assisted Surgery	2+1
WMI-616	Clinical Operative Urology Surgery	2+1
WMI-632	Epidemiology	2+0
SUT-641	Fundamental of Infection Control	2+1
Total Semester Credit Hour		17
EIGHT SEMESTER		
SUT-617	Surgical Pharmacology	2+1
SUT-618	Clinical Operative Orthopedic Surgery	2+1
SUT-619	Clinical Operative Thoracic Surgery	2+1
WMI-633	Research Project	6+0
WMI-634	Seminar	1+0
		16
Total Semester Credit Hour		
Total Course Credit Hour		134

Semester/Year	Name of Subject	CODE	Credits
First	ANATOMY-I	WMI-601	4(3+1)
	BIOCHEMISTRY-I	WMI-602	4(3+1)
	PHYSIOLOGY-I	WMI-603	4(3+1)
	PAKISTAN STUDIES	WMI-604	2(2+0)
	ENGLISH-I	WMI-605	2(2+0)
	COMPUTER SKILLS	WMI-606	2(1+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 musculoskeletal.
- 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.

Practical's:

1. Study Axial and Appendicular skeleton on human Skeletal model.
2. Study musculoskeletal system on human Musculo Skeletal 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 Snell.

Reference books:

- Netter Atlas of Anatomy 5th Edition Saunders.
- Gray's Anatomy for student's 2nd Edition Drake Vogel Mitchell.

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:

Acids, bases, pH and buffers, Biochemical composition and functions of the cell membrane, Transport across the cell membrane, Carbohydrates: Introduction, structure, function, digestion and absorption, Amino acids and proteins: Introduction, structure, function, digestion and absorption, Lipids: Introduction, structure, function, digestion and absorption, Vitamins and minerals, Fluid, electrolyte and acid base balance, Cell signaling and hormone action, Body secretions: Composition and function of saliva, gastric acid (HCL), pancreatic juice, bile, hormones and GI functions

Practical's:

1. Blood sample collection for Biochemical analysis
2. Preparation and calculation of Solutions
3. Principles of Biochemistry analyzers (spectrophotometer, flame photometer)
4. Determination of Cholesterol, TG, HDL, LDL, sugar, calcium and phosphorus in blood

Recommended Books

- Harper's Biochemistry Robert K. Murray, Daryl K. Graner 28th edition 2009
- Biochemistry by Dr. U. Satyanarayana, UChakrapani
Lehninger Principles of Biochemistry, 6E
Marks' Essentials of Medical Biochemistry A Clinical Approach, Second Edition

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

Practical's:

2. Introduction to microscope
3. Bleeding time
4. Clotting time
5. WBCs count
6. RBCs count
7. Platelets count
8. 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

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, Allamah Muhammad Iqbal and Quaid-e-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. *Ethnos - 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 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 4313506.
- Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 4534030.

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 1st2010

Second	ANATOMY-II	WMI-607	4(3+1)
	BIOCHEMISTRY-II	WMI-608	4(3+1)
	PHYSIOLOGY-II	WMI-609	4(3+1)
	ISLAMIC STUDIES	WMI-610	2(2+0)
	COMMUNICATION SKILLS	WMI-611	2(2+0)

Course Objectives:

- To understand the basic concepts of anatomy beginning from the cell organization to organs 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.

Practical's:

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 Anatomy 5th Edition Saunders.
- Gray's Anatomy for students 2nd Edition Drake Vogel Mitchell.
- BD. Chourasia Anatomy (Allregions)

Course objective:

By the end of this course the students of BS technology will be able to:

- Discuss the basic concept of biomolecules and its metabolism in human body
- Describe the significance of various enzymes and hormones in human body
- Demonstrate various enzymes and hormones on biochemistry analyzer and interpret its result for the diagnosis and monitoring

Content:

Carbohydrates metabolism (Glycolysis, Glycogenolysis, Gluconeogenesis, Glycogenesis, Pentose phosphate pathway, Fermentation and ethanol metabolism, Krebs cycle, ETC, Cori cycle, Glucose alanine cycle), Protein and amino acids metabolism (synthesis and degradation of amino acids, Lipid metabolism (Beta oxidation, Cholesterol metabolism), Nucleotide metabolism (Purine and pyrimidine degradation, uric acid formation), Nutrition (Major food groups, Balanced diet , Metabolic changes in starvation, Protein energy malnutrition, Obesity, kwashiorkor, Marasmus), Clinical diagnostic enzymology: clinical significance of ALT, AST, ALP, GGT, LDH and isoenzymes, CK and isoenzymes, Pancreatic lipase and amylase, cholinesterase, G6PD, ACP, cardiac troponins, ANP, BNP and pro-BNP)

Practical:

- Determination of liver, cardiac, pancreatic enzymes
- Determination of urea and uric acid
- Demonstration of ELISA, CMIA and CLIA instrument

Books:

Biochemistry by Dr. U. Satyanarayana, U Chakrapani

Marks' Essentials of Medical Biochemistry A Clinical Approach, Second Edition Harper's

Illustrated Biochemistry a LANGE medical book twenty-sixth edition Lehninger

Principles of Biochemistry, 6E

Mc Graw Hill's Manual of laboratory and diagnostic tests by DENISE D. WILSON, PHD, APN, FNP, ANP

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 , hematopoiesis, 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.

Practical's

2. Spirometry
3. Electrocardiography
4. Blood Pressure Measurement.
5. Normal and abnormal ECG interpretation.
6. Pulse rate measurement
7. 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

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 Towhead, Belief in Prophet hood, Belief in the Day of Judgment, Worships, Salaat / Prayer, Zakat /Obligatory Charity, Suam / 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

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 4313506.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN0194313492.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN0194313506
- 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 4534022.

THIRD SEMESTER		
SUT-601	Surgical Instruments /Equipments	2+1
WMI-612	General Pathology-I	2+1
WMI-613	General Pharmacology-I	2+1
WMI-614	Behavioral Sciences	2+0
WMI-615	Bioethics	2+0
WMI-636	Haematology-I	2+1
WMI-637	Medical Microbiology-I	2+1
Total Semester Credit Hour		18

Course Objectives:

- To enable students to identify surgical instruments.
- Asses the efficiency of surgical instruments and equipments.
- Arrange instrument set before surgery.

Course Outlines:

Common surgical Equipment and Furniture:Aseptic (sterile)Technique,Operating room Attire, sterile Attire, Operating room Table, operating room different parts, Operating table attachment, Operating room furniture,

Electro Surgical unit, control panel for the Electro surgical unit, Mono polar Electro surgical unit, Bipolar surgical unit, Argon beam coagulation, Auto transfusion machine.

General Surgical Supplies: Surgical sponges , syringes, Tubes,drains,catheter and post-op splints, Suture and suture Needles, Endoscopic Equipment, Laser and types of laser.

Practical:

1. Exercise to identify instrument immediately.
2. Assessment of instrument efficiency.
3. Preparation of surgical instrument box before surgery.
4. Exercise to know about operating room attire.

Recommended Books:

- Synopsis A hand guide of surgical instruments.
- Colleen J Rutherford,RN,CNOREducator.Differetiating Surgical Equipment and supplies
- Nancy Marie Phillips, 11thedition.Berry Kohn's Operating Room Technique.
- Maxine A.GoldMan, Room,3rdEdition.Pocket guide to the Operating Room.

Course Objectives:

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

Course outlines:

Introduction to pathology, Cell injury, Cellular adaptation, Acute Inflammation, Chronic Inflammation, Cell Repair & Wound Healing, Regeneration & Repair, Haemodynamic Disorders, Edema, Hemorrhage, 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

Practical:

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

Recommended Books:

- Kumar, Abbas and Aster; 9th edition. Robbins Basic Pathology.

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:

Introduction to Pharmacology, Pharmacokinetics, Pharmacodynamics, Adverse effects of drugs, Classification of drugs, Drugs affecting the Autonomic Nervous System, Opioids, Drugs Affecting CVS, Drugs Affecting Endocrine system, Gastrointestinal Drugs, Autacoids& Autacoids, Antagonists, Anesthetics, Analgesics, Norcotics, Muscle Relaxants, Non-Norcotic Analgesics

Practical:

1. Prescription writing and its parts
2. Calculation of drug dosage and percentage solutions
3. Study of the action of drugs on the rabbit's eye
4. Preparation of solution
5. General principles of antibiotic use and surgical prophylaxis
7. Introduction to experimental pharmacology and pharmacy sources of drugs.
8. Demonstration of common dosage forms
9. Routes of administration of drugs
10. Effect of exercise on heart rate

Recommended books:

1. Mycek, 2nd edition 2000 published. Lippincott Raven Lippincott's pharmacology (text book)
2. Bertram Katzung 8th Edition, Appleton. Katzung textbook of pharmacology (Reference Book)

Course Objectives

- Conducting diagnostic interviews
- Formulating and clarifying diagnostic findings and treatment recommendations
- Documenting evaluation and treatment procedures, involving duties such as recording results of diagnostic interviews, lab studies, and/or treatment plans in a timely way according to the medical records protocols of the rotation site

Course Contents:

Introduction to Behavioral Sciences and its importance in health: Bio-Psycho-Social Model of Health Care and the Systems Approach, Normality vs Abnormality, Importance of Behavioral sciences in health, Desirable Attitudes in Health Professionals
Understanding Behavior: Sensation and sense organs, Perception, Attention and concentration, Memory, Thinking, Communication, Individual Differences: Personality, Intelligence, Emotions, Motivation, Learning, Stress and Stressors, Life Events, Stress, Management, Interviewing / Psychosocial History Taking, Allied Health Ethics-Hippocratic oath, Culture and Allied Health practice, Psychological reactions, Breaking Bad News, Pain, Sleep, Consciousness.

Recommended Books:

- Behavioral Sciences by M.H Rana 2007, [edition 5th](#)
- Sociology in a Changing World by [William Kornblum 8th edition 2007](#)
- Changing Behavior: Immediately Transform Your Relationships with Easy-to-Learn, Proven Communication Skills by [Georgiana Donadio 2011, edition 5th](#)

Course objectives:

- Conducting diagnostic interviews
- Formulating and clarifying diagnostic findings and treatment recommendations
- Documenting evaluation and treatment procedures, involving duties such as recording results of diagnostic interviews, lab studies, and/or treatment plans in a timely way according to the medical records protocols of the rotation site

Course Outlines:

Introduction to Behavioral Sciences and its importance in health: Bio-Psycho-Social Model of Health Care and the Systems Approach, Normality vs Abnormality, Importance of Behavioral sciences in health, Desirable Attitudes in Health Professionals
Understanding Behavior: Sensation and sense organs, Perception, Attention and concentration, Memory, Thinking, Communication, Individual Differences: Personality, Intelligence, Emotions, Motivation, Learning, Stress and Stressors, Life Events, Stress, Management, Interviewing / Psychosocial History Taking, Allied Health Ethics-Hippocratic oath, Culture and Allied Health practice, Psychological reactions, Breaking Bad News, Pain, Sleep, Consciousness, Communication Skills

Recommended Books:

1. M.H Rana .Behavioral Sciences
2. [William Kornblum](#),Sociology in a Changing World
3. [Georgiana Donadio](#).Changing Behavior: Immediately Transform Your Relationships with Easy-to-Learn, Proven Communication by skills.

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

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:

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

FORTH SEMESTER		
SUT-602	Surgical Setup and Positioning	2+1
SUT-603	Sterilization and Disinfection	2+0
WMI-616	General Pathology – II	2+1
WMI-617	General Pharmacology – II	2+1
WMI-638	Medical Microbiology-II	2+1
WMI-642	Diagnostic Imaging	1+1
Total Semester Credit Hour		16

Course Objectives:

- To introduce students with different operation designs.
- To enable future technologists to regulate OT according to standard protocols.
- To enable students to suggest operation theater designs to meet requirements.
- Practice aseptic techniques in patient draping.
- Ensure suitable patient position according to the surgical exposure required.
- Prevent nerve damage during surgeries.

Course contents:

Physical Layout of surgical Suite: Construction or Renovation planning and design team, Principles in construction and renovation planning, Types of physical Plant design, Location, Transition Zones: Preoperative Check in unit, Preoperative holding Area, Induction room, Post Anesthesia Care unit, Peripheral Support Areas Operating room: Size, Substerile room, Piped in Gases, Computer line and Electrical Systems

History And Back ground, Preliminary Considerations, Anatomic and physiologic consideration, Equipment for positioning, Surgical Positions, Supine, Trendelenburg's position, Reverse Trendelenburg position, Fowler position, Lithotomy position, Prone position, Modified prone position. Modifications for Individual Patient Needs. Physical preparation and draping of the surgical site.

Practical:

- Study Operation Theater designs.
- Identify errors in present operation theater designs.
- Search new modern OT designs in developed countries.
- Use of different parts of OT table.
- Use of OT table attachments and frame work for patient positioning.
- Surgical site exposure and draping.

Recommended Books:

- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- 25th Edition volume 1. Bailey and Love's Short practice of surgery

Course Objectives:

- To differentiate between disinfection and sterilization.
- To demonstrate sterilization techniques.
- Inspection of sterilization level of instruments and OT environment.

Course Content:

- Sterilization & Disinfection
- Methods of Sterilization
- Preparation & Packing
- Designing Sterilization Process
- Sterilization by Dry Heat
- Sterilization by Moist Heat
- Auto Clave for instrument linen and perishable items
- Sterilization by Gaseous Chemicals
- Sterilization by Gamma Radiation
- Chemical Sterilization & Disinfection
- New Sterilization methods
- Sterilization by Filtration
- Environmental Disinfection
- Testing the Process of Sterilization
- Central Sterile Supply Department (CSSD)
- Disinfecting Solution
- Handling of Infectious Hospital Waste

Practical:

1. Selection of sterilization techniques for specific surgical items.
2. Arrangement and packing instruments.
3. Operate steam Autoclave.
4. Methods of assessing sterilized items.

Recommended Books:

- ,Nancy Phillips ,11th Edition.Berry Kohn's Operating room Technique.
- Colleen J. Rutherford.Differentiating Surgical equipment and supplies

Course objectives:

- Aim is to familiarize students by defining various frequently used terms in pathology. Diseases are discussed with focus on the role of etiology and pathogenesis.
- Upon successful completion of this course, students should be able
 - To explain the mechanisms underlying the major disease processes affecting the human body.
 - To develop an understanding of the salient features of the more commonly encountered diseases in clinical environment.
 - To identifying the etiology, and underlying general principles operating in disease within the major organ systems of the body.

Course Contents:

Ischemic heart disease, myocardial infarction, angina pectoris, valvular heart disease, congenital heart diseases, varicose veins, anemias, thalassemia, leukemias, thrombocytopenia, DIC, meningitis, brain tumor, stroke, brain trauma, asthma, pneumonias, tuberculosis, COPD, chronic bronchitis, pleural effusion, emphysema, nephritic syndrome, nephrotic syndrome, hypertension, hydronephrosis, renal stone, urinary tract obstruction, aphthous ulcer, peptic ulcer, malabsorption, hernias, intestinal polyps, gastritis, appendicitis, hemorrhoid, jaundice, liver cirrhosis, hepatitis, gallstone, rheumatoid arthritis, thyroid goiter, hypo and hyper thyroidism, diabetes insipidus, pheochromocytoma, pancreatitis, carcinoma of cervix, abnormal uterine bleeding, ectopic pregnancy, carcinoma of breast, vaginitis, benign prostate hypertrophy, carcinoma of prostate, STDs,

Recommended Book:

Kumar, Abbas and Aster, 9th . edition Robbins basic pathology

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.

Course objectives:

- To introduce the students with basic concepts in virology and parasitology.
- To introduce the students with common viral and parasitic infections.
- To introduce the students with diagnosis of common viral and parasitic infections.

Course contents:

Biosafety levels, control of hospital infection, biomedical waste management, introduction to virology, Viral morphology, structure, replication and classification, general properties of virus, pathogenesis and control of virus, common viral pathogen prevailing in Pakistan, introduction to parasitology, Parasite (protozoan and helminthes) morphology and classification, general principal of pathogenesis, immunology and diagnosis of parasitic infection, common parasitic pathogen prevailing in Pakistan.

Practical:

1. Cleaning of new and used glass wares for microbiological purposes.
2. Students should be familiar to use autoclave, hot air oven, water bath, steamer etc.
3. Macroscopic and microscopic examination of stool for adult worms, ova, cysts, larvae.
4. Visit to hospital for demonstration of biomedical waste management.
5. Demonstration of common serological tests used for the diagnosis of viral and parasitic infection.
6. Demonstration of malarial parasites in blood and bone marrow.
7. Demonstration of leishmania in blood film.
8. Concentration techniques for intestinal parasites in stool.

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.

Course Objectives:

- To understand basic principles of radiation protection and law in relation to use of ionizing radiation.
- To elaborate principles of different imaging techniques .
- To enable students to organize and understand investigations according to surgical case.

Course Outlines:

Introduction, How to request imaging, Interpreting imaging, Hazards of imaging, Current Legislations, Diagnostic Imaging ,Conventional Radiograph, Ultrasound, Computerized Tomography. Magnetic Resonance Imaging.

Practical:

1. Prepare Imaging request card.
2. Preparation of patient for various radiological examinations.
3. Interpretation of Images.

Recommended Book:

- Nancy Marie Phillips, 11thedition.Berry Kohn's Operating Room Technique.
- 25th Edition volume 1.Bailey and love's Short practice of surgery
- Comuswhalan,Assisting at surgical operations,practicalguide.
- Maxine A.GoldMan,3rdEdition,Pocket guide to the Operating Room.

FIFTH SEMESTER		
SUT-604	Surgical Emergency – I	2+1
SUT-605	Surgical IC – 1	2+1
WMI-606	Surgical First Assistance	2+1
WMI-610	Quality Assurance and Biosafety	1+0
WMI-640	Anesthesia Equipment	2+1
WMI-643	General Surgery	2+1
Total Semester Credit Hour		17

Course Objectives:

At the end of this course the student will be able to:

- Understand the priorities of trauma management
- Be able to rapidly and accurately assess trauma patients needs
- Be able to resuscitate and stabilize trauma patients
- Know how to organize basic trauma care in hospital.

Course Outlines:

Assessment and Management:

Primary and secondary Survey, Airway and Ventilator Management, Shock and Hemorrhagic Control, Abdominal Trauma, Head Injury, Spine and Spinal Cord Trauma, Musculoskeletal trauma, Pediatric Trauma, Burns, Life support- Basic and Advanced, Prevention of Accidents

Practical:

1. Primary and Secondary Survey.
2. Airway clearance.
3. Cricothyroidotomy
4. Passing oral, nasal tubes and ETT.
5. Tracheostomy
6. Chest tube intubation.
7. Log roll method
8. Shock management:
9. IV line Maintenance
10. Venous cut down
11. Catheterisation
12. Suturing techniques
13. Assessment of musculoskeletal system.

Recommended Book:

- 25th Edition. Bailey and Love's Short practice of surgery.
- Prof. Dr Arshad Cheema, KEMU Trauma Course Manual

Course Objectives:

By the end of this course the student should be able to:

- Acquire competency in assessing patients and in performing physical examination of patients in critical care units.
- Provide nursing care to patients with critical care problems.
- Demonstrate skill in the safe use of critical care equipment and monitors.
- Provide interventions in compliance with critical unit policies and protocols

Course Outlines:

Critical care in anesthesiology, Acute chest pain, Tachypnea and dyspnea, Upper and lower airway obstruction, Pulmonary edema /ARDS, Pneumothorax, Hypoxemia, Hypotension, Shock states, Anaphylactic and Anaphylact reactions, Hypertensive Emergencies.

Acute Confusional states and altered consciousness, Acute seizures/convulsion, Oliguria and anuria, Acute disturbances in thermoregulation, Acute abdominal pain.

Practicals:

1. History and examination.
2. Monitoring Skills: Temperature recording, capillary blood sampling,
3. Arterial blood sampling, venous blood sampling
4. Cardio-respiratory monitoring,
5. pre & postoperative patient monitoring and management accordingly.
6. Therapeutic Skills: Tracheostomy, chest tube insertion, suturing,
7. Catheterization, airway management, nasogastric feeding,
8. Endotracheal intubation, cardiopulmonary resuscitation, venepuncture and administration of fluids, blood.
9. Blood components, parenteral nutrition, common dressings, abscess drainage.
10. Basic principles of rehabilitation, bed sores management.

Recommended Book:

- 25th Edition. Bailey and Love's Short practice of surgery
- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Maxine A. Goldman, Room, 3rd Edition. Pocket guide to the Operating Room.
- Colleen J Rutherford, RN, CNOR Educator. Differentiating Surgical Equipment and supplies

Course Objectives:

- Provide basic concept of surgical First Assistance with standard protocols.
- By the end of this course student will be to assist in surgical procedures.

Course Outlines:

Historical back ground,Surgical first Assistant knowledge and skill level,What does Surgical first assistant do?

Disciplines Associated with First Assisting in surgery

Practical's:

1. Principles of safe surgery:
2. Preparations for surgery
3. Hand washing, scrubbing and gowning
4. Use of surgical checklists including WHO
5. Administration of local anesthesia
6. Incision of skin and subcutaneous tissue
7. Closure of skin and subcutaneous tissue
8. Types of surgical knots
9. Hemostasis:
10. Surgical techniques
11. Principles of diathermy
12. Tissue handling and retraction:
13. Choice of instruments
14. Use of drains:
15. Biopsy techniques
16. Principles of anastomosis

Recommended Book:

- 25thEdition.Bailey and love's Short practice of surgery
- Berry Kohn's, Nancy Marie Phillips, 11thedition.Operating Room Technique.
- Colleen J Rutherford,RN,CNOREducator.Differetiating Surgical Equipment and supplies

Course Objectives:

- To introduce concept of Quality Assurance in health care field.
- To equip students with biosafety techniques.
- To enable students to take precautionary measures.

Course Detail:

Environmental Hazards and Biosafety

Classification of Hazards, Physical Hazard and safeguard: Environmental Factor, Body Mechanics, Ionizing, Radiation, Patientsafety, on Ionizing radiation, Electricity

Safeguard, Fire Explosions, Fire safety

Chemical Hazards And safe guards: Anesthesiagases, Sterilizing Agents, Safe handling of Cytotoxic Agents.

Biologic Hazards and Safe guard: Infectivewastes, Biohazards, Reproductive hazards, Risk Management for Quality assurance.

Care of perioperative Environment: Historical background, standards of cleanliness in surgical, establishing surgical environment, room turnover between patients, daily terminal cleaning.

Practical:

1. Precautionary measures to avoid physical, chemical and biological hazards.
2. Handling emergency situations like fire and explosions.
3. Inspecting anesthesia gas cylinders and gas leakage.

Recommended Books:

- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- 25th Edition. Bailey and Love's Short practice of surgery

SUT-640 ANESTHESIA EQUIPMENT Credit Hour:3 (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, endotracheal tubes(ETT), airways(oral and nasal), suction machine, infusion pump, reservoir bags, resuscitator bags, thermometer, sphygmometer, stethoscope, oxygen purity meter,

Operation theater table, flexible endoscope, intravenous cannulas, spinal needle, epidural catheter, Magill gag, Magill incubating forceps, latest technology.

Practical's:

- 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 Objectives:

- To provide an overview regarding operating room attire.
- To provide knowledge regarding general surgical procedure.
- How the patient prepare before surgery.
- To provide knowledge regarding sterilization and disinfection.

Course outline.

Aseptic and scrubbing technique, Patient Assessment, Layout of Standard History taking, Examination, Investigations, Introduction to Surgery Importance of imaging in surgical conditions, Interventional Radiology, Diagnostic Process.

Arterial Disorders Arterial Stenosis or Occlusion, Arterial Dilatation, Aortic Aneurysm, and its surgical management.

Venous Disorders Venous Incompetence, Varicose Veins, Venous Thrombosis and surgical management.

Musculoskeletal Disorders Fractures of the Bones, Dislocation of Joints, Describing a dislocation or fracture, Complications of dislocation or fracture and its surgically management.

The Cranium Head & Brain Injury, Hydrocephalus, Intracranial Tumors.

The Breast Investigations, Benign breast disease, malignant tumors of the breast.

Diseases of the GIT Congenital abnormalities of the Esophagus, Splenomegaly & Splenectomy, Stones & Stricture in Bile duct, Cholelithiasis, Cholecystectomy, Vermiform Appendix, Appendicitis, Appendectomy Anorectal Disorders.

Diseases of the Genito Urinary System Imaging investigations of the Genital tract, Congenital abnormalities of Kidneys & renal tract, Hydronephrosis, Renal & Ureteric & Bladder Calculi, Urethral Stricture, Varicocele & Hydrocele.

Biopsy, Hernia, Hernioraphy, Herniotomy,

Practical's:

1. Practice Scrubbing techniques.
2. Proper Gowning and gloving.
3. To gain knowledge about different surgical procedure.
4. Draping and surgical field preparation.
5. How to apply surgical attire.
6. To assess the different surgical procedure.
7. Setting surgical instruments on trolley.

Recommended Books:

- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- 25th Edition volume 1. Bailey and Love's Short practice of surgery

SIXTH SEMESTER		
SUT-607	Diagnostic Procedure	1+1
SUT-608	Clinical Operative General Surgery	2+1
SUT- 609	Clinical Operative Gynecology Obstetrics	2+1
SUT-611	Per Operative Care	2+1
WMI-630	Biostatistics	2+1
WMI-631	Research Methodology	2+1

Course Objectives:

- To provide knowledge and skills regarding diagnostic procedures.
- To handle latest technology machines being used in surgical set up.
- To enable surgical technologists to perform minor diagnostic procedures independently.

Course Outlines:

Introduction to minimal invasive surgery, Patient care consideration for diagnostic procedure, Pathologic examination: Biopsy and its different types.

Diagnostic procedure of Abdominal: Abdominal laparoscopy ,choledocoscopy , ERCP, cholangiogram, Cholangiography, Esophagoscopy, gastroscopy, colonoscopy, sigmoidoscopy, laproscopic fundoplication, Diagnostic proctoscopy.

Diagnostic procedure of Thoracic : Brochoscopy , Mediastinoscopy, Thorascoscopy, Bronchography.

Diagnostic procedure of Bones: Arthroscopy, Arthrography,

Diagnostic procedure of Genital Urinary : Diagnostic cystoscopy , URS, Nephroscopy, Urethroscopy , different Endoscopic machine name.

Mamography, Ventriculography, Angiography, Arteriography, Myelography, Urography, cystography, Cytourethrography,

Practical:

1. Cleaning and disinfection of scopes and cannulas.
2. Standard Aseptic solution preparation.
3. Sterilization of scopes.
4. Perform minor surgical diagnostic procedures
5. Tissue Biopsy: True cut, needle biopsy

Recommended Book:

- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOR Educator. Differentiating Surgical Equipment and supplies
- Maxine A. Goldman, Room, 3rd Edition. Pocket guide to the Operating Room.

Course Objectives:

By the end of this course student will be able:

- To gain basic knowledge of general surgery
- To participate in surgical procedure as surgical first assistant.
- To prepare OT from instruments to theater for specific surgeries according to requirement.

Course Outlines:

Special Considerations for General Surgery, Breast procedures, Abdominal surgery, Biliary tract procedures, Liver Procedures, Splenic procedures

Pancreatic procedures. Esophageal procedures, Gastro intestinal surgery, Gastric Procedures, Intestinal Procedures, Complications of Abdominal Surgery, Anorectal procedures, Excision of Pilonidal Cysts and sinuses, Hernia procedures, Amputations of Extremity.

Practical:

1. Investigations required for particular case.
2. Consent, surgical safety checklist application
3. Patient positioning.
4. Checking instrument and equipments efficiency before procedure.
5. Patient positioning and draping.
6. Surgical first assistance for all general surgical procedures
7. Surgical skills, anastomosis and hemostasis skills.
8. Suturing and drain tubes handling.
9. Anesthesia recovery.

Recommended Book:

- Comuswhalam, Assisting at surgical operations, practical guide.
- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOR Educator. Differentiating Surgical Equipment and supplies.

Course Objectives:

- By the end of this course student will be able :
- To gain basic knowledge of gynecology and obstetrics.
- To participate in surgical procedures as surgical first assistant.
- To prepare OT from instruments to theater for specific surgeries according to requirement.

Course Outlines:

Anatomy and physiology of the female reproductive System, Gynecology General Consideration, Vulvar Procedure, Vaginal Procedure, Abdominal Procedures, abdominal hysterectomy, pelvic exenteration, procedures involving fallopian tubes, Perioperative Obstetrics ,threatened abortion, aborted pregnancy, cesarean birth ,prenatal testing, special considerations.

Practical:

1. Investigations required for particular case.
2. Consent, surgical safety checklist application
3. Patient positioning.
4. Checking instrument and equipment efficiency before procedure.
5. Patient positioning and draping.
6. Surgical skills, anastomosis and hemostasis skills.
7. Suturing and drain tubes handling. Anesthesia recovery.

Recommended Book:

- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOR Educator. Differentiating Surgical Equipment and supplies
- Maxine A. Goldman, Room, 3rd Edition. Pocket guide to the Operating Room.

Course Objectives:

- To provide students concept regarding pre,intra and post-Operative care.
- To enable Students to manage surgical patients peri-operatively.
- To provide concept of fluid and Electrolyte requirements

Course Outlines:

Professional Ethical values of Peri-operative staff

Care of the Peri-operative environment

Pre-operative Nutritional assessment

Fluids and Electrolytes

Fluid and Nutritional consequence of intestinal resection,

Artificial nutritional support, Total parenteral nutrition.

Pre-Operative care:

History taking, Physical examination, Investigations, Treatment plan, Informed Consent,

,Pre-operative management of high Surgical risks

Intra Operative care: Aseptic measures

Gowning, Gloving, suturing, Basic surgical skills and Anastomosis.

Post-Operative Care:

Patient Recovery,

Assurance of Air Way, Breathing and circulation,

Post-operative Patient positioning

Monitoring of complications,

Monitoring of Vitals and oxygenation,

Shifting of the patient to ward

Practical:

1. Introduction, history taking
2. Physical examination.
3. Investigations
4. Fluid management/blood availability
5. Patient counseling
6. Transfer to OR.
7. Shifting to OT table
8. Surgical safety checklist application.
9. Handling Tubes

Recommended Book:

- Comuswhalan. Assisting at surgical operations, practical guide.
- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOR Educator. Differentiating Surgical Equipment and supplies
- Maxine A. Goldman, Room, 3rd Edition. Pocket guide to the Operating Room.

Course Objectives:

- It will help the students to analyze data pertaining to their research work
- To assess the significance of their experimental designs. Without statistical analysis research articles are not accepted for publication by the scientific journals.
- To provide Students, sound knowledge of the statistical programs.

Course Outlines:

Introduction to Biostatistics, Collection of Primary and Secondary data, Editing of data, Presentation of data, Measures of Central Tendency, Measures of Dispersion: Range, Quartile Deviation, Mean Deviation, Standard Deviation by direct and short-cut method, Variance, and their Coefficient, Correlation, Regression and method of least square, Probability, Sampling and Basic Design, Hypothesis Testing, Chi-square test, Student's t-test, Analysis of variance, Laboratory Experiments pertaining to the course.

Practical:

10. Computer lab practice
11. Research work.

Recommended Book:

- Stanton, A.G., 2001. Primer of Biostatistics. McGraw Hill.
- Jekel, J., Elmore, J.G., Katz, D.L., 2001. Epidemiology, biostatistics and preventive medicine. W. B. Saunders.
- Quinn, G., 2002. Experimental Design and Data Analysis for Biologists. Cambridge University Press.
- Fernholz L.T, Morgenhaler, S., Stahel, W., 2000. Statistics in Genetics and in Environmental Sciences, Birkhauser Verlag.
- Kuzma J. W. and Bohnenblust, S. E. 2001, Basis Statistics for the Health Sciences, McGraw-Hill International Education

Course Objectives:

- To introduce the methods involved in research
- To learn about the plagiarism, copyright and patents law.

Course Details:

Introduction: Research and professions, Understanding the research process, History and Principles of research ethics, Originality of Research, Conflicts of interest, Copyright and Patent Law, Aims of research, The research topic, Title and research problem.

Literature review: Search, Retrieve and manage information, research design, Qualitative Methodologies and interpretation of results, Conclusions and its Validity, Report writing and the research proposal, Abstract and manuscript preparation, Communicating your own credentials, Communicating own work-CV, Development of a grant proposal using the grant, format of national and international agencies, interviewing techniques, Plagiarism and its professional consequences.

Practical:

1. Research project

Recommended Books:

- Ann Bowling, A. and Ebrahim S. 2005. Handbook of Health Research Methods. Open University Press, Two Penn Plaza, New York, NY.
- Baumgartner, T. and Hensley, L. 2006. Conducting and Reading Research in Health and Human Performance 4thed McGraw Hill, New York.
- Kumar, R., 2010. Research Methodology: A Step-by-Step Guide for Beginners. 3rd edition. SAGE Publications, London

Seventh Semester		
SUT-613	Clinical Operative Pediatric Surgery	2+1
SUT-614	Clinical Operative Neuro Surgery	2+1
SUT-615	Clinical and operative Endoscopy, Robotic assisted Surgery	2+1
WMI-616	Clinical Operative Urology Surgery	2+1
WMI-632	Epidemiology	2+0
SUT-641	Fundamental of Infection Control	2+1
Total Semester Credit Hour		17

Course Objective:

- The student able to know the pediatric patient care in term of developmental stages.
- To get knowledge about pediatric anesthesia.
- The student able to know common several surgical procedures that are performed on pediatric patients.

Course Content:

Key terms and definition related to pediatric surgery, Congenital Anomalies, Acquired Disease, Peri Operative Assessments of the Pediatric patient, Fluid and Electrolyte Balance Consideration, Pediatric Anesthesia, Intra operative Pediatric Patient care consideration.

General Surgery procedures: Endoscopic procedure, Biliary Atresia, Esophagus Atresia, Imperforate Anus, Intussusception, Pyloromyotomy, Hreniorrhaphy, Omphalocele, Gastroschisis, Appendectomy, Splenectomy, Bezoores.

Genito Urinary Surgery: Cystoscopy, Nephrectomy, Nephrostomy, Pyeloureteroplasty, Wilm,s tumor, Nuerogenic Bladder, Extrophy of the Bladder, Ureteral Re-implantaion, Urethral repair, Orchidopexy, Circumcission, Fracture, Tendon repair, Congenital dislocation, Scoliosis.

ENT surgery: Myringotomy, Adenoidectomy, Tonsillectomy, Tympanoplasty, Cleft lip, Cleft palate, Tracheostomy, Hemangioma, Otoplasty, Craniosynostosis, Encephalocele, Hydrocephalus, Myelomeningocele, Spina Bifida, Pectus excavation, Co-arcation of Aorta, PDA, VSD, ASD ,Atrioventricular canal defect, Tetralogy of fallot, Truncus arteriosis, Post pediatric care.

Practical's:

- Investigations required for particular case.
- Consent,surgical safety checklist application
- Patient positioning.
- Different pediatric procedure assists.
- Making of different pediatric procedure position.
- Checking instrument and equipments efficiency before procedure.
- Patient positioning and draping.Surgicalskills,anastomosis and hemostasis skills.
- Suturing and drain tubes handling.
 - Anesthesia recovery.

Recommended Book:

- Comuswhalan. Assisting at surgical operations,practical guide.
- Nancy Marie Phillips, 11thedition.Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOR Educator. Differetiating Surgical Equipment and supplies

SUT-614 CLINICAL OPERATIVE NEURO SURGERY Credit Hours: 3(2+1)

Course Objectives:

By the end of this course student will be able:

- To gain basic knowledge of neuro surgery
- To participate in surgical procedure as surgical first assistant.
- To prepare OT from instruments to theater for specific surgeries according to requirement.

Course Outlines:

Different terminology related to Neurology surgery, Anatomy and Physiology of Brain,

Special consideration in Neurosurgery, Method of hemostasis during Neurology surgery, Different position for Neurology surgery.

Surgical procedures of the cranium: Craniectomy , Brain pacemaker, Craniotomy, Cranioplasty , Intra cranial tumor, Excision of an Acoustic Neuroma.

Surgery of Cranial Blood Vessel: Cerebral Revascularization, Artriovenous malformation, Occlusion of an Aneurysm, Steriotaxis, Aspiration, Functional Neurosurgery.

Intracranial Neoplasm, Control of Epilipsy, Cortical Resection, Corpus Collosotomy, Hemispherectomy.

Extracranial procedure: Transsphenoidal procedure, External occlusion of an carotid artery, Surgical Procedures of Head injuries and it,s management.

Craniotomy for intracerebral hematomata. Hydrocephalus Surgical Management

Complications of head injuries.

Key and term related to spinal cord surgery, pathology of the vertebra and spinal cord, spinal cord tumors.

Surgical procedure of spinal cord: Discectomy, percutaneous Discectomy, Thoracic spine surgery, Lumber spine surgery, Special interment names which are used in spinal surgery.

Practical's:

1. Investigations required for particular case.
2. Consent, surgical safety checklist application
3. Patient positioning.
4. Checking instrument and equipments efficiency before procedure.
5. Patient positioning and draping.
6. Surgical skills, anastomosis and hemostasis skills.
7. Suturing and drain tubes handling.

Recommended Book:

- Comuswhalan. Assisting at surgical operations, practical guide.
- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOR Educator. Differentiating Surgical Equipment and supplies
- Maxine A. Goldman, Room, 3rd Edition. Pocket guide to the Operating Room.

Course Objectives:

By the end of this course student will be able:

- To gain basic knowledge related to Endoscopic and Robotic surgery.
- To participate in surgical procedure as surgical first assistance and handle control room for Endoscopic and robotics.
- To prepare OT from instruments to theater for specific surgeries according to requirement.
- To get knowledge about all Endoscopic and Robotic instruments.

Course Outlines:

Different terminology related to Endoscopic and Robotic surgery, Eight essential elements of Endoscopy, Knowledge and skills for safe Endoscopic Environment.

Gastrointestinal procedure: Oesophagogastrodeudenoscopy, Endoscopic of small intestine, Capsule Endoscopy, ERCP, sigmoidoscopy, colonoscopy.

Thoracic procedure: Thorascopy, Mediastenoscopy, Brochoscopy.

Urology procedure: Diagnostic cystoscopy, Urethroscopy, Uretero renal scopy.

Laparoscopic procedures, principle of laproscopic procedure, Hazards of endoscopy, Care of endoscopes, Considerations for patient safety, Duties of the assistant flexible endoscopy, Robotic Assisted Endoscopy and Telemedicine

Practicals:

1. Cleaning and disinfection of scopes and cannulas.
2. Standard Aseptic solution perparation.
3. Sterilization of endoscopes.

Recommended Book:

- Comuswhalan. Assisting at surgical operations, practical guide.
- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOR Educator. Differentiating Surgical Equipment and supplies
- 25th Edition. Bailey and love's Short practice of surgery

COURSE OBJECTIVE:

- After studying this course, the learner will be able to
- To identify the complication and problem related to Genito Urinary system.
- Able to know different Renal surgical procedure.
- Describe the different diagnostic procedure performed for kidney , ureter and bladder.
- Describe the procedure performed for prostate cancer.

COURSE CONTENT:

Anatomy and physiology of kidney, Ureter , Bladder and Urethra, Different terminology related to Urology surgery, Urinary symptom(Hematuria, Anuria, Renal pain , Ureteric pain), Investigation of the Urinary tract, (Urine, imagine, IVU, RUPG, Antegrade pyelography, Urethrography, Venography, Ultrasoungraphy, Cystography), Congenital abnormalities of kidney, Renal pelvis and Ureter, Aberrant Renal vessel, Renal and Ureteric calculus, Hydronephrosis, PCN, PCNL, Pyelolithotomy, Extended pyelolithotomy, Nephrolithotomy, Uretrolithotomy, URS, Ureteric meatotomy, Lithotripsy, ESWL, Push Bang, Neoplasm of kidney, Nephrectomy, Partial Nephrectomy, Radical Nephrectomy, Urethral catheterization, Neurogenic Bladder, Incontinence of Urine, Urodynamics test, Prostatectomy, Bladder stone, Litholopexy, ERBG, TURP, Supra pubic cystostomy, Hypospadias, Epispadias, Meatotomy.

- **Practicals:**
- Investigations required for particular case.
- Consent,surgical safety checklist application
- Patient positioning.
- Checking instrument and equipments efficiency before procedure.
- Patient positioning and draping.
- Surgical skills,anastomosis and hemostasis skills.
- Suturing and drain tubes handling.

Recommended Book:

- Comuswhalan.Assisting at surgical operations,practical guide.
- Nancy Marie Phillips, 11thedition.Berry Kohn's Operating Room Technique.
- Colleen J Rutherford,RN,CNO Educator.Differentiating Surgical Equipment and supplies
- Maxine A.GoldMan, Room,3rd Edition. Pocket guide to the Operating Room.

Course Objectives:

- To develop the understanding of epidemiology.
- Describe the different mathematical tools of epidemiology.
- Define and examine descriptive and analytical epidemiology.

Course Outlines:

Introduction to epidemiology: Types of epidemiology, clinical, occupational, experimental, interrelation of factors, Epidemiological methods, incidence, prevalence, rate, susceptibility etc. Types of studies, cross sectional, cohort, case control, Epidemiologic consideration in disease process, Sampling methodology: procedure, sample size, cluster sampling, sampling error, bias, risk, data collection of infectious disease cases, antibiotic resistance profile of infectious agents. Screening tests, accuracy of screening tests, predictive value, reliability, Epidemiological polarization, Disease pattern in community & Social diversity, Cyclicity of diseases: Chicken Pox, measles, Rota virus infections, mumps, Flu, common cold and prevailing pandemics and epidemics. Surveillance, prevention, control and eradication of disease.

Status of health services in Pakistan: comparison with other countries. Predisposing factors of epidemics in developed countries and a comparison with the existing factors in Pakistan

Practicals:

Questioner based survey to determine the current infections and prevailing infections

Recommended Books:

- Ziegler, A., and Koenig, I. R., 2006. A Statistical Approach to Genetic Epidemiology: Concepts and Applications. John-Wiley and Son Limited. Khardori, N., 2006. **Bioterrorism Preparedness: Medicine – Public Health Policy**. John Wiley and Sons limited.
- Fos, P.J., 2010. Epidemiology Foundations: The Science of Public Health: 1st Edition. Wiley, John & Sons, Incorporate
- Friis, R.H., 2010. Epidemiology For Public Health Practice: 4th Edition. Publisher: Jones & Bartlett Learning.
- Baily, S., 2012. Introduction To Epidemiologic Research Methods In Public Health Practice. Jones & Bartlett Learning.
- Rothman, K.J., 2012. Epidemiology: An Introduction: 2nd Edition. Oxford University Press.

Course objectives:

- To introduce the students with basic concepts in infection control.
- To introduce the students with infection control principles and practices.
- To introduce the students with importance of immunization and hand hygiene in infection control.
- To introduce the students with the role of clinical laboratory in infection control.

Course contents:

Introduction to infection control, principle of infection control, source and transmission of infection, infection in the hospital environment, immunization prophylaxes, exposure prophylaxes, sterilization, disinfection and antisepsis, practical disinfection, epidemiology of infectious disease, antimicrobial agents, antibiotic and their uses (prophylactic, empirical, and therapeutic), antibiotic resistance and policy, principles of laboratory diagnosis of infectious diseases, biomedical waste management, biosafety levels, hand hygiene, standard precautions and PPE.

Practical:

1. Demonstration of hand washing and hand rubbing technique.
2. Preparation of different disinfection and antiseptic solutions.
3. Demonstration of biomedical waste managements in hospitals.
4. Demonstration of cleaning and disinfection of working premises.
5. Demonstration of how to handle spills and aseptic handling.
6. Demonstration of standard precautions and PPE.

Recommended Books:

- Fundamentals of Infection Prevention and Control: Theory and Practice. [Weston](#), D., Wiley-Blackwell, 2013.
- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- District Laboratory Practice in Tropical Countries, Part1 & Part 2. [Cheesbrough](#), M., 2nd ed. Cambridge University Press, 2006.
- Medical Microbiology and Infection at a Glance. Gillespie, S., H., Bamford, K., B., 4th ed. Wiley-Blackwell, 2012.

EIGHT SEMESTER		
SUT-617	Surgical Pharmacology	2+1
SUT-618	Clinical Operative Orthopedic Surgery	2+1
SUT-619	Clinical Operative Thoracic Surgery	2+1
WMI-633	Research Project	6+0
WMI-634	Seminar	1+0
		16

Course objective:

At the end of this course the student will be able to know

- How to calculate drug dosages in the peri operative environment.
- Able to know list common drugs used in surgery.
- Identify drug sources and the effect on patient use.
- Able to demonstrate drug handling in a sterile environment.

Course outline:

Keys terms and definition, Pharmacology baseline, Consideration in surgical pharmacology, Drugs Development, Surgical drugs and pharmaceutical sources, Synthetic and Semi synthetic sources, pharmacological forms used in surgery, potential complication caused by Pharmaceutical and Herbal Medicine.

Practical:

- Checking the medicine used in pre operative environment.
- Drugs handling correctly in a sterile field.
- To avoid pharmaceutical error.

Recommended Book:

- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Maxine A. Goldman, Room, 3rd Edition. Pocket guide to the Operating Room.

Course Objectives:

- By the end of this course student will be able :
- To gain basic knowledge of thoracic surgery.
 - To participate in surgical procedures as surgical first assistant
 - To prepare OT from instruments to theater for specific surgeries according to requirement.

Course Outlines:

Key and Term related to Thoracic surgery, Anatomy and physiology of Thorax, Special Feature of Thoracic surgery, Special Thoracic instruments.

Endoscopic Thoracic surgical Procedures: Bronchoscopy, Special instrument which are used in Bronchoscopy, Airway stent, Mediastinoscopy, Thorascopy.

Open Thoracic surgical procedures: Thoracotomy, different incisional approaches, Posterolateral Thoracotomy, Anterolateral Thoracotomy, Medainsternostomy, Partial sternotomy, parasternotomy.

Lung assests Devices: Extracorporeal Memberane oxygenator, Intravascular Oxygenator.

Rib Resection, Mediastinotomy, Correction of pectus Deformity, Lung Resection, Lobectomy, Thoracoplasty, Thymectomy.

Chest Trauma

Intra Thoracic Esophgeal Procedures

Overview of Cardiac injuries

Airway Obstruction

Myocardial infarction

Cardiopulmonary bypass

Heart transplantation

Complications of Thoracic Surgery

Post-operative complications in Cardiac surgery

Practicals:

1. Investigations required for particular case.
2. Consent, surgical safety checklist application
3. Patient positioning.
4. Checking instrument and equipments efficiency before procedure.
5. Patient positioning and draping, Surgical skills, anastomosis and hemostasis skills.
6. Suturing and drain tubes handling.
7. Anesthesia recovery.

Recommended Book:

- Comuswhalan. Assisting at surgical operations, practical guide.
- Nancy Marie Phillips, 11th edition. Berry Kohn's Operating Room Technique.
- Colleen J Rutherford, RN, CNOREducator. Differentiating Surgical Equipment and supplies
- Maxine A. GoldMan, Room, 3rd Edition. Pocket guide to the Operating Room.

Course Objectives:

- By the end of this course student will be able :
- To gain basic knowledge of orthopedic surgery.
- To participate in surgical procedures as surgical first assistant.

Course Outlines:

Historical back ground, The Art and Science of orthopedic Surgery

Anatomy and physiology musculoskeletal system, Special features of Orthopedic Surgery, Extremity procedures

Fractures,Joint procedures, Repair of tendons and Ligament,CastApplication,Complications after Orthopedic Surgery

Practical:

1. Investigations required for particular case.
2. Consent,surgical safety checklist application
3. Patient positioning.
4. Checking instrument and equipment efficiency before procedure.
5. Patient positioning and draping.
6. Surgical skills,anastomosis and hemostasis skills.
7. Suturing and drain tubes handling.
8. Anesthesia recovery.
9. Cast Application.
10. Implants.
11. Use of image intensifiers.

Recommended Book:

- Nancy Marie Phillips, 11thedition.Berry Kohn's Operating Room Technique.
- Colleen J Rutherford,RN,CNOREducator.Differetiating Surgical Equipment and supplies
- Maxine A.GoldMan, Room,3rd Edition. Pocket guide to the Operating Room.

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 Semester 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.

WMI--407

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