

**CURRICULUM FOR  
B.SC (HONS) SURGICAL TECHNOLOGY  
(OPERATION THEATRE)  
4 YEARS (8 SEMESTER)**



**BACHA KHAN UNIVERSITY CHARSADDA**

<https://hims.edu.pk/>

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## PREFACE

A university is the zenith of knowledge that imparts quality education and awards degrees for extensive educational attainments in various disciplines. Protection of traditional knowledge. Making exploration about it and obtaining deep understanding about modern technology and research techniques are some of responsibilities of the university. The mission of University is chartered to develop an intellectually conducive environment providing excellence and innovation in education and research to produce competent and community oriented BS Paramedics Health Professionals.

Allied Health Sciences is a field in medicine which has been completely neglected up till now so that there is absolute dearth of trained Allied health personnel who are the actual service providers to the patients, as a matter of fact they form the connection link between the doctors and the patients which is missing altogether in our health care system.

This document precisely briefs the details of B.Sc program and master programs as prepared by the experts' committee. I am pleased to acknowledge the efforts made by Prof. Dr Abdul sattar and honorable members of Board of Studies. The contribution made by them will go a long way in the education and training in the field of AHS.

I hope this program will meet the latest trends in B.S and Master Programs and will certainly produce competent Para Medical personnel to fill in the gap in the system which is main objective of this program.

Prof. Dr. Fazal Rahim  
Vice Chancellor  
Bacha Khan University  
Charsadda



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## **AIMS AND OBJECTIVE OF THE COURSE**

### **Aims:**

The aims of the 4 years program in Bachelor in B.Sc (Hons) Surgical Technology (Operation Theatre) is to equipped the student with relevant professional knowledge, skills, techniques and ethical values to enable them to apply their acquired expertise at the level between the doctor and the patient for efficient health services delivery.

### **OBJECTIVES**

B.Sc (Hons) Surgical Technology (Operation Theatre) education and training should enable the student to:

- Develop accuracy and meticulousness to attain high levels of ethics and technical proficiency.
- Access the technical and non technical skills in a standardized and reproducible environment
- Strengthen the decision power and exercise appropriate judgment skills, to be applied especially and during crisis.
- Develop good leadership, problem solving and administrative skills.
- Develop and analyze innovative strategies for effective communication with the patient and the health care personnel.
- Demonstrate inter disciplinary team building strategies or effective co-ordination between various allied health disciplines.
- Demonstrate understanding of the basic concepts of professional behaviors and legal implementations of work environment.
- Demonstrate the knowledge of his/her role in health care delivery system.
- Establish and maintain continuing education as a faction of growth and maintenance of professional competence.

## **NOMENCLATURE AND DURATION**

### **NOMENCLATURE:**

The name of the Degree program shall be B.Sc (Hons) Surgical Technology (Operation Theatre).  
The duration the course shall be 4 year (8 semesters) with structured training in the recognized department under an approved supervisor.

### **COURSE TITLE:**

B.Sc (Hons) Surgical Technology (Operation Theatre)

### **COURSE DURATION:**

Four year, eight semesters structured training in the recognized department under the guideline of an approved supervisor.

### **CREDIT HOURS**

130 Hours

### **MEDIUM OF INSTRUCTION:**

English

### **METHOD OF INSTRUCTION:**

As a policy, active participation of the students will be encouraged. Following teaching modalities will be employed:

- Large group teachings (lectures)
- Small group teachings
- Seminar presentations
- Assignments
- Skills teachings
- Self study and use of internet

In addition, to promote interactive and communication skills, following methods will be used;

### **ELIGIBILITY CRITERIA FOR ADMISSION:**

F.Sc Pre-Medical, F.Sc Medical Technology or Equivalent HSSC Certificate from IBBC Islamabad with atleast 45% marks.

**SCHEME OF STUDIES**

<b>Semester / Year</b>	<b>Name of Subject</b>	<b>CODE</b>	<b>Cred its</b>
<b>First</b>	BIOCHEMISTRY-I	BSOT-101	3+1
	PHYSIOLOGY-I	BSOT-102	3+1
	ANATOMY-I	BSOT-103	3+1
	ENGLISH-I	BSOT-104	2+0
	PAK STUDIES	BSOT-105	2+0
	COMPUTER SKILLS	BSOT-106	1+1
			<b>18</b>
<b>Second</b>	BIOCHEMISTRY-II	BSOT-107	3+1
	PHYSIOLOGY-II	BSOT-108	3+1
	ANATOMY-II	BSOT-109	3+1
	ENGLISH-II	BSOT-110	2+0
	ISLAMIC STUDIES	BSOT-111	2+0
<b>Third</b>	SURGICAL EQUIPMENT / INSTRUMENT	BSOT-201	2+1
	GENERAL PATHOLOGY – I	BSOT-202	2+1
	STERILIZATION & DISINFECTION	BSOT-203	2+1
	COMMUNICATION SKILLS	BSOT-204	1+1
	GENERAL PHARMACOLOGY – I	BSOT-205	2+1
	QUALITY ASSURANCE & BIOSAFETY	BSOT-206	2+1
			<b>17</b>
<b>Fourth</b>	SURGICAL SETUP AND DESIGN	BSOT - 207	1+1
	GENERAL PHARMACOLOGY-II	BSOT - 208	2+1
	MEDICAL MICROBIOLOGY-II	BSOT - 209	2+1
	DIAGNOSTIC IMAGING	BSOT - 210	1+1
	GENERAL PATHOLOGY-II	BSOT - 211	2+1
	SURGICAL POSTURE AND POSITIONS	BSOT - 212	1+1
	MEDICAL BIOETHICS	BSOT - 213	2+0
			<b>17</b>
<b>Fifth</b>	SURGICAL EMERGENCY	BSOT - 301	3+1
	SURGICAL FIRST ASSISSTANCE	BSOT - 302	1+2
	SURGICAL ICU	BSOT - 303	2+1
	ANESTHESIA EQUIPMENTS	BSOT - 304	2+1
	EPIDEMIOLOGY	BSOT - 305	1+1
	GENERAL SURGERY	BSOT - 306	2+1
			<b>18</b>



<b>Sixth</b>	BIostatISTICS	BSOT - 307	2+0
	PERI OPERATIVE CARE	BSOT - 308	2+1
	RESEARCH METHODOLOGY	BSOT - 309	2+0
	CLINICAL OPERATIVE GENERAL SURGERY	BSOT - 310	2+1
	CLINICAL OPERATIVE GYNECOLOGY OBSTETRICS	BSOT - 311	2+1
	DIAGNOSTIC PROCEDURES	BSOT - 312	1+1
			<b>15</b>
<b>Seventh</b>	CLINICAL OPERATIVE ORTHOPEDIC SURGERY	BSOT - 401	2+1
	CLINICAL OPERATIVE PEDIATRIC SURGERY	BSOT - 402	2+1
	CLINICAL OPERATIVE THORACIC SURGERY	BSOT - 403	2+1
	CLINICAL OPERATIVE NEURO SURGERY	BSOT - 404	2+1
	ENDOSCOPY ROBOTIC SURGERY	BSOT - 405	2+1
	CLINICAL OPERATIVE OPHTHALMIC SURGERY	BSOT - 406	2+1
			<b>18</b>
<b>Eight</b>	RESEARCH PROJECT	BSOT - 407	6
	FUNDAMENTALS OF INFECTION CONTROL	BSOT - 408	1+1
	PHARMA RELEVANT TO SURGERY	BSOT - 409	1+1
	<b>TOTAL – 124-136</b>		<b>10</b>
	<b>TOTAL CREDIT HOURS</b>		<b>129</b>

**TOTAL CREDIT HOURS= 129**

**HEC recommendation=124-136**

### **1<sup>st</sup> SEMESTER COURSES**

- 1. BIOCHEMISTRY -I**
- 2. HUMAN PHYSIOLOGY-I**
- 3. HUMAN ANATOMY-I**
- 4. ENGLISH-I**
- 5. PAK STUDIES**
- 6. COMPUTER SKILLS**

**Aims and Objectives**

- To understand the chemical composition of macro and micro molecules of the cell
- To understand different biochemical reactions in the cell
- To utilize their knowledge scientifically

**Course Detail:**

Biochemical composition and functions of the cell, Chemistry of signals and receptors, Structure and function of Carbohydrates, Proteins and lipids, Classification of vitamins, their chemical structure & biochemical function, Sodium, potassium, chloride, calcium, phosphorus, magnesium, sulfur, iodine, fluoride, Composition, function and daily secretion of saliva, gastric juice, gastric acid(HCL), pancreatic juice, bile, and intestinal secretion, Digestion of proteins, carbohydrates, nucleic acids and lipids, Absorption of vitamins and minerals Sodium, potassium, chloride, calcium, phosphorus, magnesium, sulfur, iodine, fluoride, Respiratory chain and oxidative phosphorylation, components of respiratory chain, electron carriers, ATP synthesis coupled with electron flow, phosphorylation of ADP coupled to electron transfer, Ionization of water, weak acids and bases, pH and pK values, Body buffers and their mechanism of action, Acid base regulation in human body, Biochemical mechanisms for control of water and electrolyte balance, Types of particles in solution, Importance of selectively permeable membranes, osmosis and osmotic pressure, surface tension, viscosity, Structure & composition, Secretion, Mechanism of action of hormones

**Practicals:**

- Good laboratory Practices
- Preparation of Solutions
- Principles of Biochemistry analyzers (spectrophotometer, flame photometer)
- Determination of Cholesterol, Tg, HDL, LDL, sugar, calcium and phosphorus in blood
- Introduction to electrophoresis, PCR, gel documentation
- How to operate centrifuge, water bath and microscope

**Recommended Books**

1. A LANGE medical book Harper's Illustrated Biochemistry 26<sup>th</sup> edition
2. Medical Biochemistry by Mushtaq Ahmad vol. I and II

**Aims and 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 Detail**

**Introduction to the Human Physiology** Functional organization---relationship between structure and function of the human body, Homeostasis – its importance-- negative and positive feedback Mechanism, Control system of the body\_ Nervous and Hormonal control systems

**Integumentary System** Functions of the skin, hair, glands and nails, Body temperature and its regulation

**The Musculoskeletal System:** Functions of the bones and muscles, Functional characteristics of Skeletal Muscle, Smooth Muscle and Cardiac Muscle, The events of muscle contraction and relaxation in response to an action potential in a motor neuron, Distinguish between aerobic and anaerobic muscle contraction, Muscle hypertrophy and atrophy

**The Endocrine System** An introduction to Glands and Hormone, Different types of glands and their Hormones, Functions of the Endocrine System, Chemical Signals, receptors and hormones, Other Hormones

**Respiratory System** Different parts of respiratory system, Functions of the Respiratory System beginning at the nose and ending with the alveoli, Ventilation and Lung Volumes ,Gas Exchange and gas transport in the blood ,Control of Rhythmic Ventilation

**The Digestive System** Different parts of digestive system, Accessory organs of digestive system, Functions of each organ of the Digestive System including major salivary glands, Movements and Secretions in each organ of the Digestive System and their regulation, Physiology of Digestion, Absorption, and Transport

**Genito-Urinary System** Urine Production, Urine Movement ,Regulation of Urine Concentration and Volume ,Body Fluid Compartments ,Regulation of Extracellular Fluid Composition ,Regulation of Acid-Base Balance ,Physiology of Male Reproductive system—spermatogenesis and reproductive glands, hormones and their regulations, Physiology of Female Reproductive system--- ovulation, hormones and their regulations

**Practicals:**

- Introduction to microscope
- Bleeding time
- Clotting time
- Complete Blood Count

**Recommended Books:**

- Guyton text book of Physiology (Text Book) by Guyton published by W.B Saunders company
- Essentials of Anatomy and Physiology by Seelay, Stephens and Tate. 4<sup>th</sup> edition
- Ross & Wilson Anatomy and Physiology.
- Human Physiology. Stuart Ira Fox. 7<sup>th</sup> edition
- Text Book of Medical Physiology Guyton
- Essential of Medical Physiology Vol. I & II by Mushtaq Ahmad.
- Lecture notes on human physiology by Bray JJ, Cragg, PA MacKnight

**Aims and objectives**

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

**Course Detail****General Anatomy:**

**Musculo skeletal system**(Axial and Appendicular),Axial Skeleton, Different bones of human body, Axial and Appendicular Skeleton, Classification on the basis of development, region and function, General concept of ossification of bones, parts young bone, Blood supply of long bones.

**Joints** Structural Regional and functional classification of joints,Characteristics of synovial joints, Classification of synovial joints, Movements of synovial joints.

**Muscular System** Parts of muscle Classification of muscles (skeletal, Cardiac, smooth)

**Thoracic wall:** Muscles of thorax, Surface Anatomy, Trachea, lungs, pleura, mammary glands (breast), Heart and thoracic vessels.

**Thoracic cavity:** Mediastinum, Lungs, bronchi, blood supply and lymphatic

**Abdominal wall:** Skin, nerve and blood supply, Muscles of anterior abdominal wall.

**Abdominal cavity:** General Arrangement of the Abdominal Viscera, Peritoneum, Omenta, mesenteries, Stomach, blood, nerve, lymphatic supply, Small intestine, blood, nervous and lymphatic supply, Large intestine: blood nerve and lymphatic supply.

**The pelvic wall:** Anterior, posterior wall, diaphragm.

**Pelvic cavity:** Ureters, urinary bladder Male genital organs, Female genital organs, Muscles of pelvic region, blood supply, nerve supply, Special Senses.

**Practicals:**

- Study Axial and Appendicular skeleton on human skeletal model.
- Study musculoskeletal system on human musculoskeletal model.

- Study organs of special senses.
- Study and understand anatomy of Thorax, Abdomen and Pelvis through:
- Human Models
- Video demonstration.

**Recommended Books:**

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

**Reference books:**

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

**Aims and Objectives:**

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

**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:****1. Functional English**

## a) Grammar

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492

## b) Writing

- Writing. 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.

## c) Reading/Comprehension

- Reading. Upper Intermediate. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.

## d) Speaking



(As Compulsory Subject for Degree Students)

### **Aims and 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 Outline**

#### **Historical Perspective**

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

#### **Government and Politics in Pakistan**

Political and constitutional phases:

1947-58,1958-71,1971-77,1977-88,1988-99,1999 onward

#### **Contemporary Pakistan**

Economic institutions and issues, Society and social structure, Ethnicity, Foreign policy of Pakistan and challenges, Futuristic outlook of Pakistan

#### **Books Recommended:**

- Burki, Shahid Javed. *State & Society in Pakistan*, The Macmillan Press Ltd 1980.
- Akbar, S. Zaidi. *Issue in Pakistan's Economy*. Karachi: Oxford University Press, 2000.
- S.M. Burke and Lawrence Ziring. *Pakistan's Foreign policy: An Historical analysis*. Karachi: Oxford University Press, 1993.
- Mehmood, Safdar. *Pakistan Political Roots & Development*. Lahore, 1994.
- Wilcox, Wayne. *The Emergence of Banglades.*, Washington: American Enterprise, Institute of Public Policy Research, 1972.
- 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.

**Aims and Objectives**

- To Understand and apply the basic principles that underpin computer science
- To demonstrate basic computational concepts and elementary data structures
- To learn a range of transferable skills including communication, self-organization, and basic mathematical and logical reasoning

**Courses Detail:**

- 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:**

- Microsoft Office Introductory by Gary B. Shelly
- **Lecture Notes**

**2<sup>nd</sup> Semester Courses**

- 1. BIOCHEMISTRY-II**
- 2. HUMAN PHYSIOLOGY-II**
- 3. HUMAN ANATOMY-II**
- 4. ENGLISH-II**
- 5. ISLAMIC STUDIES**

**Aims and Objectives:**

- To understand the chemical composition of macro and micro molecules of the cell
- To understand different biochemical reactions, Metabolisms in the cell
- To utilize their knowledge scientifically

**Course Detail**

**Nutrition, Food and Dietetics** Balance food, Proteins, Fats and lipids, Carbohydrates, Vitamins and minerals, Major food groups, Nutritional status of Pakistani nation, Metabolic changes in starvation, Protein energy malnutrition, Regulation of food intake, Obesity

**BIOENERGETICS & THE METABOLISM OF CARBOHYDRATES & LIPIDS** Bioenergetics: The Role of ATP, Biologic Oxidation The Respiratory Chain & Oxidative Phosphorylation, Carbohydrates of Physiologic Significance, The Citric Acid Cycle, The Catabolism of Acetyl-CoA, Glycolysis & the Oxidation of Pyruvate, Metabolism of Glycogen, Gluconeogenesis & Control of the Blood Glucose, The Pentose Phosphate Pathway & Other Pathways of Hexose Metabolism, Oxidation of Fatty Acids, Ketogenesis, Metabolism of Unsaturated Fatty Acids & Eicosanoids, Metabolism of Acylglycerols & Sphingolipids, Integration of Metabolism—the Provision of Metabolic Fuels, Metabolism of Purine & Pyrimidine Nucleotides

**METABOLISM OF PROTEINS & AMINO ACIDS** Catabolism of Proteins & of Amino Acid Nitrogen, Catabolism of the Carbon Skeletons of Amino Acids, Conversion of Amino Acids to Specialized Products, Porphyrins & Bile Pigments

**ENZYMES** Mechanism of Action, Enzymes: Kinetics, Regulation of Activities, clinical Enzymology

**BODY FLUIDS:** Urine, Feces, CSF, Pleural and pericardial fluids, peritoneal fluid, Synovial fluid, Semen analysis

**PRACTICALS:**

- Determination of enzymes
- Urine examination
- CSF examination
- Examination of pleural, pericardial, synovial fluids

**Recommended Books:**

- A LANGE medical book Harper's Illustrated Biochemistry 26<sup>th</sup> edition
- Medical Biochemistry by Mushtaq Ahmad vol. I and II

### Aims and Objectives

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

### Course Detail

#### The Nervous System

**Functions of the central nervous system**, the functional areas of the cerebral cortex and their interactions. Functions of the parts of the brainstem diencephalons, basal nuclei, Limbic system, and cerebellum, Functions of various cranial nerves, Functions of the somatic motor nervous system Functions of the autonomic nervous system The function of neurons, neuroglial cells and their components. Resting membrane potential and an action potential, the function of a synapse and reflex arc

**The functions of the specialized sense organs** Eye---- physiology of site, accommodation, optic nerve and optic chiasm, 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 of Blood and Plasma Functions of Blood, Formed Elements, Stages of cell development, Blood grouping, and Coagulation mechanism

**The Cardiovascular system** Functions of the Heart Electrical Activity of the Heart origin and propagation of cardiac impulse Phases of the Cardiac Cycle Heart Sounds Regulation of Heart Functions--- intrinsic and extrinsic, Functions of the Peripheral Circulation The Physiology of Circulation Pulmonary Circulation 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.

**Immunity** Define immunity, Innate Immunity, Adaptive Immunity Antigens and Antibodies, Primary and secondary responses to an antigen, Antibody-mediated immunity and cell-mediated immunity, Role of lymphocyte in immunity regulation

#### Practicals

- Spirometry
- Electrocardiography

- Blood Pressure Measurement
- Normal and abnormal ECG interpretation
- Pulse rate measurement
- Heart sounds

### **Recommended Books**

- Guyton text book of Physiology (Text Book) by Guyton published by W.B Saunders company
- Essentials of Anatomy and Physiology by Seelay, Stephens and Tate. 4<sup>th</sup> edition
- Ross & Wilson Anatomy and Physiology.
- Human Physiology. Stuart Ira Fox. 7<sup>th</sup> edition
- Text Book of Medical Physiology Guyton
- Essential of Medical Physiology Vol.I & II by Mushtaq Ahmad.
- Lecture notes on human physiology by Bray JJ, Cragg, PA MacKnight

**Aims and objectives**

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

**Course Detail:**

**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.

**Nervous System** Autonomic nervous system, Central nervous system

**Practicals:**

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

- Human Models
- Video demonstration
- Study radiographs of upper and lower limb.

**Recommended Books****Essential books** (text books)

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

**Reference books**

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

**Objectives:**

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

**Course Contents**

**Writing Skill,** CV and job application, Technical Report writing, Writing styles **a)**

Changing narration: Converting a dialogue into a report

b) Converting a story into a news report **c)** 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.

**Suggested 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.
- Reading and Study Skills by John Langan
- Study Skills by Riachard
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition



**Aims and 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 Detail**

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)**

### **3<sup>rd</sup> Semester Courses**

- 1. SURGICAL INSTRUMENTS /EQUIPMENTS**
- 2. GENERAL PATHOLOGY-I**
- 3. STERILIZATION & DISINFECTION**
- 4. COMMUNICATION SKILLS**
- 5. G. PHARMACOLOGY**
- 6. QUALITY ASSURANCE AND BIOSAFETY**

**Course Objectives:**

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

**Course Contents:**

Common surgical Equipment and Furniture:Aseptic Technique,Operating room Attire,Operating room Table, Operating room furniture  
Electro Surgical unit.

General Surgical Supplies: Tubes,drains,catheter and post-op splints,Suture and suture Needles, Specialty Equipment

**Practicals:**

1. Exercise to I identify instrument immediately.
2. Assessment of instrument efficiency.
3. Preparation of surgical instrument box before surgery.

**Recommended Books:**

- Synopsis A hand guide of surgical instruments.
- Differentiating Surgical Equipment and supplies,Colleen J Rutherford,RN,CNOR Educator.
- Berry Kohn's Operating Room Technique,Nacy Marie Phillips, 11<sup>th</sup> edition.
- Pocket guide to the Operating, Maxine A.GoldMan, Room,3<sup>rd</sup> Edition.

**Course Objectives:**

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

**Course Contents:**

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

**Practicals:**

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

**Recommended Books:**

- Robbins Basic Pathology by Kumar, Abbas and Aster; 9<sup>th</sup> edition

**Course Objectives:**

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

**Course Contents:**

Instruments Cleansing and Decontamination, Disinfection of Items used in patient care, Methods of disinfection, Disposal products, Sterilization versus disinfection, Sterilization. Assembly of instrument sets, packing instruments Thermal Sterilization, Chemical sterilization, Radiation sterilization, Control Measures.

**Practicals:**

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:**

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

**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.
1. Introduction to Communication, Meaning and definition of Communication, The process of communication, Models of communication
  2. Effective Communications in Business, Importance and Benefits of effective communication, Components of Communication., Communication barriers, Non verbal communication
  3. Principles of effective communication, Seven Cs.
  4. Communication for academic purposes, Introduction to academic writing, Summarizing, paraphrasing and argumentation skills, Textual cohesion
  5. Communication in Organizations, Formal communication networks in organizations, Informal communication networks, Computer-mediated communication (videoconferencing, internet, e-mail, skype, groupware, etc)
  6. Business Writing , Memos , Letters, Reports , Proposals , Circulars, etc
  7. 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 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.
- To describe the process through which a drug must go as it is being developed and tested for safety.
- To describe basic facts about drugs such as names, sources, classification systems, preparations, and routes of administration

**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, Narcotics, Muscle Relaxants, Non-Narcotic Analgesics

**Practicals:**

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:**

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



**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 Contents:**

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: Anesthesia gases , Sterilizing Agents, Safe handling of Cytotoxic Agents.

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

**Practical:**

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

**Recommended Books:**

- Berry Kohn's Operating room Technique, Nancy Phillips, 11th Edition.
- Bailey and love's Short practice of surgery 25<sup>th</sup> Edition.

## **4<sup>th</sup> Semester Courses**

- 1. SURGICAL SETUP DESIGN**
- 2. GENERAL PHARMACOLOGY-II**
- 3. MEDICAL MICROBIOLOGY-II**
- 4. DIAGNOSTIC IMAGING**
- 5. G. PATHOLOGY-II**
- 6. SURGICAL POSTURE AND DESIGNS**
- 7. MEDICAL BIO ETHICS**

**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 theaters designs to meet requirements.

**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, Inductionroom, Post Anesthesia Care unit, Peripheral Support Areas

Operating room: Size, Substerile room, Piped in Gases, Computer line and Electrical Systems

**Practicals:**

1. Study Operation Theater designs.
2. Identify errors in present operation theater designs.
3. Search new modern OT designs in developed countries.

**Recommended Books:**

- Berry and Kohn's Operating Room Technique, Nancy Phillips, 11<sup>th</sup> Edition
- Bailey and love's Short practice of surgery 25<sup>th</sup> Edition volume 1.

**COURSE OBJECTIVES:**

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

**Course Detail:**

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 2nd Edition published by Lippincott Raven 2000.

Katzung textbook of pharmacology (Reference Book) by Bertram Katzung 8<sup>th</sup> Edition, Published by Appleton. dec 2007.

**COURSE OBJECTIVES:**

- To introduce the students with basic concepts in Microbiology (Bacteriology) and acquire skill in practical work.
- To produce a team of Medical Technologists steeped in knowledge of Bacteriology.
- To equip Medical Technologists with latest advance techniques in the field of bacteriology

**Course Contents:**

Introduction to microbiology, sterilization and disinfection, General characteristics of bacteria, Clinical significance of bacteria, Isolation and identification of bacteria: Gram positive and negative cocci, Gram positive and negative rods, gram negative cocco-bacilli, spirochaetes, intracellular organisms, cell wall deficient organisms, automation in microbiology: Bactec Radiometric System and Bact Alert

**Practicals:**

1. Gram staining technique (staining, observation, inference, principle, application)
2. ZiehlNeelsen staining technique (staining, observation, inference, principle, application)
3. Albert's staining technique (staining, observation, inference, principle, application)
  - a. preparation, Inoculation and Maintenance of culture media
  - b. Sterilization by autoclaving

**Recommended Book:**

- Monica Cheesbrough, Medical Laboratory Manual For tropical Countries volume I
- Monica Cheesbrough, Medical Laboratory Manual For tropical Countries volume II
- Kenneth J. Ryan, Sherris Medical Microbiology

**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 Contents:**

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

**Practicals:**

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

**Recommended Book:**

- Berry Kohn's Operating Room techniques, Nancy Marie Phillips, 11 Edition section 12
- Bailey and Love's Short practice of surgery 25<sup>th</sup> Edition
- Assisting at surgical operations, practical guide, Comuswhalan.
- Pocket guide to the Operating Room, Maxine A. Goldman, 3<sup>rd</sup> Edition

**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 heartdisease, congenital heart diseases, varicose viens,anemias, thallasemia, leukemias, thrombocytopenia, DIC, meningitis, brain tumor, stroke, brain trauma, asthma, pneumonias, tuberculosis, COPD, chronic bronchits, 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, hepitis, gall stone, rheumatoid arthritis, thyroid goiter, hypo and hyper thyroidism, diabetes insipidus, pheochromocytoma, pancreatits, carcinoma of cervix, abnormal uterine bleeding, ectopic pregnancy, carcinoma of breast, vaginitis, benign prostate hypertrophy, carcinoma of prostate, STDs,

**Recommended Book:**

- Robbins basic pathology ninth edition by kumar, Abbas and Aster

**COURSE OBJECTIVES:**

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

- Practice aseptic techniques in patient draping.
- Ensure suitable patient position according to the surgical exposure required.
- Prevent nerve damage during surgeries.

**Course Contents:**

Patient care consideration for diagnostic procedure, Pathologic examination: Biopsy, Surgical specimens handling, Diagnostic Proctoscopy

Band Ligation, Diagnostic laparoscopy, Diagnostic Arthroscopy, Diagnostic Cystoscopy.

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's:**

1. Use of different parts of OT table.
2. Use of OT table attachments and frame work for patient positioning.
3. Surgical site exposure and draping.

**Recommended Books:**

- Berry and Kohn's Operating Room Technique, Nancy Marie Phillips, 11 Edition.
- Assisting at Surgical operations- A practical guide, Comus Whalan.



**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-Psychosocial 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:**

- Behavioral Sciences by M.H Rana
- Sociology in a Changing World by William Kornblum
- Changing Behavior: Immediately Transform Your Relationships with Easy-to-Learn, Proven Communication Skills by Georgiana Donadio

## **5<sup>TH</sup> SEMESTER COURSES**

- 1. SURGICAL EMERGENCY**
- 2. SURGICAL FIRST ASSISTANCE**
- 3. IC MANGMENT -I**
- 4. ANSTHESIA EQUIPMENT**
- 5. EPIDEMIOLOGY**
- 6. GENERAL SURGERY**

**COURSE OBJECTIVES:**

At the completion of this course student will:

- 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 Contents:**

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

**Practicals:**

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 role method
8. Shock management:
9. IV line Maintenance
10. Venous cut down
11. Catheterisation
12. Suturing techniques
13. Assesment of musculosketal system.

**Recommended Book:**

- Bailey and love's Short practice of surgery,25th Edition.
- KEMU Trauma Course Manual, Prof. DrArshadCheema.

**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

**Practicals:**

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:**

- Berry and Kohn's Operating room technique section 2,unit 5
- Assisting At Surgical operations- Apractical guide, ComusWhalan
- Bailey and love's Short practice of surgery,25th Edition.

**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 Contents:**

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 anaphylactoid 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:**

1. Berry Kohn's Operating room Technique, Nancy Phillips, 11th Edition.
2. Bailey and Love's Short practice of surgery 25<sup>th</sup> Edition.
3. Differentiating Surgical Equipment and Supplies, Colleen J Rutherford, RN MSN, CNOR.

**Course Objectives:**

To provide basic knowledge regarding anesthesia.

To enable students to arrange anesthesia equipment and drugs before surgery.

To enable future technologists to handle emergency cases related to anesthesia.

**Course Details:**

.Types of anesthesia, Airways, Supplemental

Oxygen,Suction,Anesthesiamachinery,Otherquipments,Block needle and supplies,IV supplies and solutions, Medications.

**Practicals:**

Operating pulse oximeter. (Anesthesia Machine).

Checking colour codes and valves of anesthesia gas cylinders.

Observation of blood pressure during surgery.

Passing ETT and techniques to maintain Air way in emergency situations.

**Recommended Books:**

1. Berry Kohn's Operating room Technique,Nancy Phillips, ,11th Edition.
2. Bailey and love's Short practice of surgery 25<sup>th</sup> Edition.
3. Differentiating Surgical Equipment and Supplies,Colleen J Rutherford,RN MSN,CNOR.

**COURSE OBJECTIVES:**

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

**Course Contentss:**

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 counties. Predisposing factors of epidemics in developed countries and a comparison with the existing factors in Pakistan

**Practicals:**

1. 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: 1<sup>st</sup> Edition. Wiley, John & Sons, Incorporate

- Friis, R.H., 2010. Epidemiology For Public Health Practice: 4<sup>th</sup> 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: 2<sup>nd</sup> Edition .Oxford University Press.



**COURSE OBJECTIVE:**

- To provide an overview regarding geographical layout of surgical setup.
- To practice standard protocols of operation theater.
- To induce importance of disinfection and sterilization.

**Course Contents:**

Clean and sterile zones in OR, Asepsis, Scrubbing, Types of scrub disinfectant solutions, Gowning Gloving, sterilization. Operating Room Theatre: Temperature and humidity, Illumination, Ventilation System, Common Equipment and Furniture, Operating Room Attire, Electrosurgical Units, Medical Gases, Patient Positioning Equipment's, Surgical instruments.

Preoperative Preparation: Patient Assessment, Layout of Standard History taking, Examination, Investigations, Management. Clinical and Operative Surgery: FNAC, Excision and Biopsy, Hernia, Hernioraphy, Herniotomy, Appendicitis, Appendectomy, Cholelithiasis, Cholecystectomy

**Practicals:**

1. Practice Scrubbing techniques.
2. Proper Gowning.
3. Standard Open and close gloving methods.
4. Draping and surgical field preparation.
5. Packing surgical instruments.
6. Sterilization in autoclave
7. Setting surgical instruments on trolley.

**Recommended Books:**

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

## **6<sup>TH</sup> SEMESTER COURSES**

- 1. BIostatISTICS**
- 2. PERI OPERATIVE CARE**
- 3. RESEARCH METHODOLOGY**
- 4. CLINICAL OPERATIVE GEN. SURGERY**
- 5. CLINICAL OPERATIVE GYNECOLOGY OBSTETRICS**
- 6. DIAGNOSTIC PROCEDURES**

**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 Contents:**

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.

**Practicals:**

1. Computer lab practice
2. 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 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:**

Nutritional assessment,fluids and Electrolytes,Nutritional requirments,Fluid and Nutritional consequence of intestinal resection,Artificial nutritional support,Total parenteral nutrition.

Pre-Operative care:History taking,Physical examination,Investigations,Treatment plane,Informed Consent,Pre-operative preparation,Pre-operative management of high Surgical risk Patient,Nutrition and fluid therapy.Intra Op care: Aseptic measure, Gowning Gloving Draping,Basic surgical skil and AnastmosisPost-Operative Care:Patient Recovery,Assurance of Air Way,Breathing and circulation,Monitor pain,Watch for complication,Monitor Vitals and oxygenation,Plane,Discharge..

**Practicals:**

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
10. Aseptic measures
11. Anesthesia recovery
12. Post-operative patient assessment.
13. Estimation of percentage dehydration based upon physical examination findings.
14. Calculation of deficit volume of fluid.

**Recommended Books:**

Berry Kohn's Operating Room techniques, Nancymariephillips11 Edition section 12

Bailey and love's Short practice of surgery 25th Edition

Assisting at surgical operations,practicalguide,Comuswhalam.

**Course Objectives:**

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

**Course Contentss:**

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.

**Practicals:**

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 4<sup>th</sup>ed McGraw Hill, New York.
- Kumar, R., 2010. Research Methodology: A Step-by-Step Guide for Beginners. 3<sup>rd</sup> edition..SAGE Publications, London

**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.

**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.
6. Surgical skills, anastomosis and hemostasis skills.
7. Suturing and drain tubes handling.
8. Anesthesia recovery.

**Recommended Book:**

- Berry Kohn's Operating Room techniques, Nancy Marie Phillips, 11 Edition section 12 unit 33.
- Bailey and Love's Short practice of surgery 25th Edition.
- Assisting at surgical operations, practical guide, Comuswhalan.

**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, Diagnostic Techniques, Vulvar Procedure, Vaginal Procedure, Abdominal Procedures, Perioperative Obstetrics

**Practicals:**

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:**

- Berry Kohn's Operating Room techniques, Nancy Marie Phillips, 11 Edition section 12 unit 33.
- Bailey and Love's Short practice of surgery 25th Edition.
- Assisting at surgical operations, practical guide, Comuswhalan.



**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:**

Patient care consideration for diagnostic procedure, Pathologic examination:Biopsy,Surgical specimens handling,Diagnostic Proctoscopy,Band Ligation,Diagnostic laparoscopy,Diagnostic Arthroscopy,Diagnostic Cystoscopy.Machines:endoscopes,arthroscopes.etc

**Practicals:**

1. Cleaning and disinfection of scopes and cannulas.
2. Standard Aseptic solution preparation.
3. Sterilization of scopes.
4. Assistance in diagnostic procedures.

**Recommended Book:**

- Berry Kohn's Operating Room techniques, Nancy Marie Phillips 11 Edition section 12
  - Bailey and Love's Short practice of surgery 25th Edition
  - Assisting at surgical operations, practical guide, Comus Whalan
  - Pocket guide to the Operating Room, Maxine A. Goldman, 3rd Edition

## **7<sup>TH</sup> SEMESTER COURSES**

- 1. CLINICAL OPERATIVE ORTHOPEDIC SURGERY**
- 2. CLINICAL OPERATIVE PEDIATRIC SURGERY**
- 3. CLINICAL OPERATIVE THORACIC SURGERY**
- 4. CLINICAL OPERATIVE NEURO SURGERY**
- 5. ENDOSCOPY,ROBOTIC SURGERY**
- 6. CLINICAL OPERATIVE OPHTHALMIC SURGERY**

**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, Cast Application, Complications after Orthopedic Surgery

**Practicals:**

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:**

- Berry Kohn's Operating Room techniques, Nancymariephillips, 11 Edition section 12 unit 33.
- Bailey and love's Short practice of surgery 25th Edition.  
Assisting at surgical operations,practical guide,Comuswhalan.

**Aims and Objective**

This course is designed for the students of B.Sc (Hons) Surgical Technology (Operation Theatre) to understand the basic of pediatric surgery. The student will gain

- Use the framework of pediatric surgery to understand basic general surgery principles in the Management of fluids and electrolyte, nutritional assessment and administration, preoperative and postoperative care, assessment of complications, and follow-up care
- Understand and be exposed to basic operative procedures
- Participate in hands on experience in the OR, clinic, and teaching rounds

**Course Contents**

- Preoperative and postoperative management of the neonate and child.
- Head and neck
- Endoscopy
- Thoracic
- Abdominal
- Tumors
- Endocrine
- Urology
- Neural tube defects
- Trauma

**Recommended Books**

- Operative Pediatric Surgery, Seventh Edition by Lewis Spitz, Arnold Coran.
- Operative Pediatric Surgery by Moritz Ziegler, Richard G. Azizkhan, McGraw Hill Professional.
- Atlas of Pediatric Surgical Techniques By Dai H. Chung, Mike Y Chen

**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:**

Anatomy and physiology of Thorax, Special Features of thoracic surgery, Thoracic surgical Procedures, Chest Trauma, Intra Thoracic Esophageal Procedures, Complications of Thoracic 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:**

- Berry Kohn's Operating Room techniques, Nancy Marie Phillips, 11 Edition section 12 unit 33.
- Bailey and Love's Short practice of surgery 25th Edition.
- Assisting at surgical operations, practical guide, Comuswhalan.

**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 Contents:**

Anatomy and Physiology of Brain, Special consideration in Neurosurgery, Surgical procedures of the cranium.

**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.
8. Anesthesia recovery.

**Recommended Book:**

- Berry Kohn's Operating Room techniques, Nancymariephillips ,11 Edition section 12 unit 33.
- Bailey and love's Short practice of surgery 25th Edition.
- Assisting at surgical operations,practical guide,Comuswhalan.

**COURSE OBJECTIVES:**

By the end of this course student will be able:

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

**Course Contentss:**

Historical Background, Eight essential elements o Endoscopy, Knowledge and skills for safe Endoscopic Environment, Types of Endoscopic procedures

Laparoscopic procedures, 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:**

- Berry Kohn's Operating Room techniques, Nancymariephillips ,11 Edition section 12 unit 33.
- Bailey and love's Short practice of surgery 25th Edition.
- Assisting at surgical operations, practical guide, Comuswhalan.

**COURSE OBJECTIVES:**

By the end of this course student will be able:

- To gain basic knowledge of ophthalmic surgery
- To participate in surgical procedure as surgical first assistant.

**Course Contents:**

Anatomy and Physiology of the Eye, Ophthalmic surgical patient care, Special features of Ophthalmic Surgery, Ophthalmic Instrumentation  
Operating microscope, Ophthalmic drugs.

**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.
6. Surgical skills,anastomosis and hemostasis skills.
7. Suturing and drain tubes handling.
8. Anesthesia recovery.

**Recommended Book:**

- Berry Kohn's Operating Room techniques, Nancymariephillips ,11 Edition section 12 unit 33.
- Bailey and love's Short practice of surgery 25th Edition.
- Assisting at surgical operations,practical guide,Comuswhalan.



## **8<sup>TH</sup> SEMESTER**

- 1. RESEARCH PROJECT**
- 2. FUNDAMENTALS OF INFECTION CONTROL**
- 3. PHARMA RELEVANT TO SURGERY**

**Aims and Objectives**

- The student will learn some basic research methodology, gain knowledge of the specific area of radiology being researched and have the opportunity for more extensive one-on-one interaction with a member of the surgical staff. It will hopefully result in some form of presentation or publication for the student. This is most suitable for students planning to enter radiology as a career

**Course Detail**

- Preparation and evaluation of Technical Comparative statement of specifications of Imaging modalities Students will select a modality item among the Surgical modalities and prepare a comparative Statement of same modality manufactured by various manufacturers.
- Comparison of two different Modalities for any specific investigation Students will select a topic under the guidance of their teacher to compare the investigation of two different modalities for the same human body system  
Example:
  - (i) Renal function test of Nuclear Medicine and IVP
  - (ii) Renal function test versus Ultrasound
  - (iii) Angiocardiology versus Nuclear medicine Cardiac Investigation
- Students will prepare a comprehensive report on Medical Imaging investigation of any human body system

**Aims and Objective**

This course provides essential information on:

- To increase knowledge and awareness of infection risks and to develop skills to minimize these risks.
- Knowledge of where micro-organisms reside and how they spread.
- Learn practices to reduce the risk of cross infection.
- Knowledge of the term “Universal precautions”
- Infection control and its management in a health care setting.
- Principles of infection control.

**Course contents**

Fundamental of infection control

**Administrative Control**

- Assign responsibility for infection control
- Work with the Health Organization/Department to conduct risk assessments and develop infection control written plan.
- Implement effective work practices for managing patients.
- Testing and evaluation of patients
- Capacity building of staff and ensure proper cleaning

**Environmental control**

- Control source of infection
- Dilute and remove contaminated air
- Control air flow

**Respiratory protection control**

- Implement Respiratory protection Program
- Train the staff in Respiratory protection
- Train patient in respiratory hygiene

**Infection control of different infectious disease**

- Tuberculosis , Cholera, Dengue, Hepatitis, Malaria, Typhoid, Pneumonia

**Recommended Books**

- Infection Control in Clinical Practice, by Jennie Wilson, 3<sup>rd</sup> Edition.
- Hospital Infection Control Guidelines: Principles and Practice Author: Singh Sanjeev, Gupta Shakti Kumar, Kant Sunil.
- Heymann D, 2004 Control of communicable diseases manual, 18th Edition.

**Aims and Objectives**

- It provides the platform to the students to interact with physician to obtain better understanding of prescribed medicine.
- It gives opportunity to assist the physician in doing a better job of prescribing and observing drug therapy.
- It also offers an opportunity to educate the patients by involving them in process of drug utilization.
- It creates opportunities of clinical oriented research development such as clinical trials, therapeutic drug monitoring etc.

**Course Contents**

- Scope of pharmacy in surgery.
- Evaluation and selection of drugs.
- Drug information.
- Drug utilization.
- Education and training programmes.
- Patient care.

**Recommended books**

- Hospital and clinical pharmacy by D.J Patil published by Nirali Prakashan Second Edition.
- Hospital Pharmacy, Stephens, Martin Second edition
- Hospital pharmacy by William E. Hassan, 5<sup>th</sup> Edition by Lea & Febiger, 1986