Curriculum

of

4 Years B.Sc. Hons Operation Theatre Technology

King Edward Medical University Lahore

Table of Contents

Table of Contents

GENERAL RULES AND REGULATIONS

1. Introduction

Care of the Surgical Patient is a team-based approach in which every member of team has its set responsibilities. Given the rapid development of health care technology like anesthesia machine, endoscopic equipment's (laparoscopy, arthroscopy) surgical intervention are now rapidly changing. With the advancement of technology, the process of Operating Room Education is made necessary element to take maximum advantage of technology to provide safe patient care in variety of surgical settings.

The role of Operating room/Surgical Technologist is very important as a member of the surgical team in the operating room who works with the surgeon, anesthesiologist and certified registered nurse, and other Operating Room Personnel is in delivering direct patient care before, during and after surgery by interacting with state of the art technology. Surgical technologists perform functions and tasks that provide a safe environment for surgical care and contribute to the efficiency of the operating team by supporting operating surgeons, nurses and others involved in diagnostic and operative procedures. Surgical technologists also work in other patient care service settings that call for special knowledge about asepsis, or about methods of making or keeping an environment antiseptic as in Central Sterile Supply department.

2. Level and Duration

All B.Sc. (Hons.) in Allied Health Sciences Programs will be places at Level-I of Higher Education (University Education). This will be equal to EU Education Level-6, and 1st cycle of University Education in most European Universities.

These Programs shall be of four (4) years.

The Entry Requirements of B.Sc. (Hons) AHS shall be twelve (12) year of school education FSc. (Pre-Medical)/equivalent).

3. Nomenclature of Qualification

B.Sc. (Hons.) Allied Health Sciences Operation Theatre /Surgical Technology.

4. Equivalence

The graduates of these programs will be given recognition, jobs and emoluments as commensurate with other B.sc (Hons) graduates of four (4) years duration after FA/FSc (Level-6 EU) and old MA/MSc Pak Programs.

5. Professional Status and Future Scope of Graduate

5.1 Care of the person requiring surgical intervention

- Participates as full member of the surgical team; take part in providing pre, intra and postoperative care
- Records and reports any pertinent information regarding patient and patient's families, including a determination of expectations and needs regarding the care provided in the surgical setting
- Communicates appropriate information to the patients and their families and the surgeon.
- Ensure the full inclusion of the patient or customer in the treatment, planning and decision-making.

5.2 Management and supervision

- Supervise the activity of supporting staff as appropriate.
- Manages Operating Room /Central Sterile Department activities assigned to him/her, including:
- Use and maintenance of instruments and equipment according to their standard Operating Procedures
- Maintenance of safe surgical environment in the Operating Room
- Inventory and stock control
- Personnel matters
- Financial matters
- Appropriate record keeping of their practice
- Quality Assurance
- Identifies and introduces improved job methods for increasing efficiency
- Interacts with professional groups and, where appropriate, Governmental and non-governmental organizations.

5.3. Training and Education

- Supervises and conducts the education and training of Operating Room Personnel's.
- Lectures and demonstrates to colleagues in his/her profession and other professionals concerned with Operating Room/Surgical technology and to other interested groups.
- To take part in and contribute to the process of continuing professional development.
- Keeps up to date new technological developments in the field of Surgery and teaching techniques.

5.4. Community Services

- Makes a professional contribution to and take part in community rehabilitation programmers.

5.5. Research and Development

- Conducts continuing evaluation of his/her activities.
- Develops and actively participates in formal evaluation and research programs.
- Participates in scientific/professional meetings and contributes papers to scientific/professional journals.
- Use outcome measures to review state of the art procedures to determine best practice

5.6. Legal and Ethical Requirement

- Provide patient care, which complies with medical/legal requirements.
- Provide patient care within a recognized surgical code of ethics.

6. Place of work/posting

- These technologists have many employment choices. In addition to the hospital operating room, they may work in private specialty practices surgery as ophthalmology, neurosurgery, obstetrics and Orthopedics. Ambulatory surgery centers also employ surgical technologists, as do veterinarians for assistance in surgery.
- These Technologists may work as sales representatives or technical specialists for teaching Operating Room Staffs how to use new equipment's, such as orthopedic devices and implants.
- Management of Central Supply department of hospital and can advanced training in hospital administration.
- In the field of education, the experienced technologists Join as Lecturer in teaching Institutions to teach and train in a variety of settings.
- Improve their education by seeking admission in M.Phil /M.Phil leading to PhD Programs

7. Program Mission

The Surgical Technology program is an integral unit of the Health Sciences and Human Services department. The program educates the student to assist the surgical team to become a vital member of the multidisciplinary healthcare workforce to ensure the quality of care is provided to every surgical patient.

8. Scheme of the Program

Type of Scheme of the Curriculum is Hybrid (combination of Semester and Annual Types). First two years are divided into four (4) semesters of twenty (20) weeks each. The second two years are of Annual Type. Both Semesters and Annual Study Block are Modularized where each module is taught and evaluated independently.

The duration of the program, the credit accumulation and transfer system and general learning objectives are based on the recommendations of the EU Higher Education. The Bloom Taxonomy of Learning Levels & Quality Assurance is derived from USA Practices.

<table>
<tr><td rowspan="5">Phase I</td><td rowspan="3">Year I</td><td colspan="2">(Semester I)
20 weeks</td><td rowspan="3">Evaluation at End of Each Module</td><td colspan="2">(Semester II)
20 weeks</td><td rowspan="3">Evaluation at End of Each Module</td></tr>
<tr><td colspan="2">Introduction to Basic Health Sciences (General)</td><td colspan="2">Introduction to Basic Engineering Sciences (General)</td></tr>
<tr><td>Theory
75%</td><td>Practical
25%</td><td>Theory
75%</td><td>Practical
25%</td></tr>
<tr><td rowspan="3">Year II</td><td colspan="2">(Semester III)
20 weeks</td><td colspan="2">(Semester IV)
20 weeks</td></tr>
<tr><td colspan="2">Applied Health Sciences (Program Specific)</td><td colspan="2">Applied Engineering Sciences (Program Specific)</td></tr>
<tr><td>Theory
50%</td><td>Practical
50%</td><td>Theory
50%</td><td>Practical
50%</td></tr>
<tr><td colspan="7">Mid Comprehensive Examination</td></tr>
<tr><td rowspan="2">Phase II</td><td>Year III</td><td>Practical Training in the field of admission</td><td colspan="3">Theory 20%
Practical Skill Learning 80%</td><td rowspan="2">Evaluation at End of Each Module</td></tr>
<tr><td>Year IV</td><td>Practical Training in the field of admission</td><td colspan="3">Theory 20%
Practical Skill Learning 80%</td></tr>
<tr><td></td><td colspan="5">Final Comprehensive Examination</td><td></td></tr>
</table>

9. Admission Criteria and Total Procedure

The applicant must meet the following academic qualification

i. F.Sc (Premedical/)/Equivalent 55% marks minimum

ii. Age less than 20 yrs

iii. Admission vacancy based/competitive/transparent

iv. Admission of all programs will be made on merit without assigning any specific program.

v. First year of education will be common for students of all programs.

Vii. Based upon merit of admission, and choice of students will be allocated specific programs at the end of the first year of education. In 3rd Semester, the students will be asked to report to their Program Director who will administer their curriculum for year 2, 3 & 4.

10. Program competencies of the graduate

10.1 Objectives

- The student accepts the Operation Theater Technology program in its full sense as a lifelong activity and that he/she is prepared to invest time and effort to acquire, maintain and further improve his/her own knowledge and skills.
- A critical appreciation of techniques, procedures is carried out in the Operartion Theater and an understanding of scientific methods is acquired for reliability and validity of observations and the testing of hypothesis.
- The ability and willingness to adopt a problem solving approach to manage clinical/research situations.
- The ability to plan and interpret a management program in Operation Theater with due regard to the patient's comfort and economic factors.
- Awareness of the role of a professional in health/research /welfare teams and his/her willingness to work cooperatively within such teams.
- Awareness of the fact that he/she has to create his/her own professional impact as a capable Operation Theater Technologist/ Surgical Technologist.
- To pursue and develop the basic scientific pursuits and guidelines for scientific discoveries to strengthen knowledge further about human body requirements.
- The candidate should recognize the importance of teamwork and function as effective member/leader of the team.

10.2 Outcomes

- The students will be able to demonstrate skills necessary in care, handling, processing, and sterilization of surgical instruments, equipment and supplies.
- Manage Operation Theatres of different surgical specialties like General Surgery, Orthopaedic Surgery, Gynecology, Ophthalmology, urology and obstetrics Surgery etc.
- The Graduates of this program will be able to work out their knowledge and apply their skills in Operating Room, the perioperative environment, infection control and central sterile supply department.
- The graduate of the Surgical Technology Program will be able to assist and manage variety of Surgical and Diagnostic Procedures at Hospitals, Ambulatory Surgery centers and surgical clinics.
- Develop an ability to solve problems
- Conduct continuing evaluation and participate in formal evaluation and research program.
- Will be able to devise improved job methods for increasing efficiency to solve problem to manage clinical and research situations.
- Will be able to adopt and apply methods and techniques to the individual needs or capabilities of patients and considering patient's comfort and economic factors.
- Will be able to demonstrate effective interpersonal skills with patients, surgeon, OR Nurses, technicians and co-workers.
- Will be able to apply administrative policies and procedures effectively in the performed duties and create his professional impact as a capable Operation Theatre/Surgical Technologist.
- Will be able to take part in, contribute to the process of continuing professional development, and keep abreast of new development in technology concerning the surgical case according to patient requirements.
- Will be able to supervise the activity of supporting staff to ensure the teamwork and function as effective team leader by taking part in planning and implementation of Standard Operating Procedures.

11. Program Specific Learning Outcome (Competencies of the Graduate)

The competencies, which a graduate will exhibit at the end of the program, will be started in following five (5) aspects;

i. Knowledge
ii. Skills
iii. Ethics
iv. Research
v. Future Scope

12. Year wise Distribution of Contact Hrs. / and Credits into Theory & Skills.

Year	**Theory Hrs.**	**Practical Hrs.**	**Total**	
			Hrs.	**Credits**
1.	1200 (75%)	400 (25%)	1600	60
2.	800 (50%)	800 (50%)	1600	60
3.	300 (19%)	1300 (81%)	1600	60
4.	300 (19%)	1300 (81%)	1600	60
Total=	**2600 (40%)**	**3800 (60%)**	**6400**	**240**

12.1 List of modules arranged semester/year wise with time allocation in wks. /hrs.

Year	Semester	Module title	Duration week	
Year 1	Semester I	Introduction to Anatomy	6	20
		Introduction to Physiology	4	
		Introduction to Pharmacology	4	
		Introduction to Biochemistry	3	
		Introduction to General Pathology	3	
	Semester II	Biostatistics	2	20
		Physics	3	
		Chemistry	3	
		Computer	3	
		Islamyat	2	
		Statistics / dynamics	2	
		English	2	
		Pakistan studies	2	

Year	Semester	Module Title	Duration week	Year
Year 2	Semester III	Abdomen Pelvis and Lower Limb Anatomy	2	20
		Thorax and upper limb anatomy	2	
		Head and Neck Anatomy	2	
		Blood and CVS Physiology	2	
		Respiratory Physiology	2	
		GIT and Endocrinology Physiology	2	
		Pharmacology for the Surgical Technologist	2	
		Pharmacology for the Surgical Technologist	2	
		Diseases of Circulatory System	2	
		Diseases of the GIT	2	
	Semester IV	Basic Microbiology	2	20
		Clinical Microbiology	2	
		Applied Microbiology	2	
		Surgical Equipment’s	2	
		Surgical Supplies in the Operating Room	2	
		Surgical Instruments	2	
		Principles of Aseptic and Sterile Techniques	2	
		Decontamination and Disinfection	2	
		Sterilization by Physical Methods	2	
		Sterilization by Chemical Methods	2	

Year 3		Introduction to Surgical Technology	3	40
		Communication and Team work	3	
		Patient transport and Positioning in Operation Theatre	3	
		Pre-Operative Laboratory Investigations	3	
		Pre-Operative Radiologic investigations	3	
		Pre-Operative Care	3	
		Operating Room Techniques	3	
		Intra and Post-Operative Care	3	
		Trauma	4	
		Elective Clinical Surgery (Ward/OPD)	3	
		Emergency Clinical Surgery(Emergency /ward)	3	
		Elective Operative General Surgery	3	
		Emergency Operative General Surgery	3	
Year 4		Introduction to Anesthesia and Techniques	3	40
		Anesthesia Equipment's	3	
		Medical Surgical Skills	3	
		Central Sterile Supply Department	3	
		Operating Room Environment and Design	4	
		Ophthalmic Surgery	6	
		Orthopedic Surgery (Surgical Assistance) in OT	6	
		Genitourinary Sugary	6	
		Pediatric Surgery	6	

The whole curriculum is divided into modules. The Curriculum of whole program is collection of curriculum of all modules.

12.1.1 YEAR 1 SEMESTER 1

BASIC MEDICAL SCIENCES

Sr. No	MODULE TITLE	CREDIT HOURS	CONTACT HOURS	WEEKS
1.	INTRODUCTION TO ANATOMY			6
2.	INTRODUCTION TO PHYSIOLOGY			4
3.	INTRODUCTION PHARMACOLOGY			4
4.	INTRODUCTION BIOCHEMISTRY			3
5.	INTRODUCTION GENERAL PATHOLOGY			3

Module Name:

INTRODUCTION TO ANATOMY

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____

Learning Objectives

- To introduce the objectives of B. Sc Medical Technology.
- To describe the general anatomy of the human body.
- To describe the anatomy of the different systems of the body.
- To describe the applied aspects of human anatomy.

Contents

1. Introduction to Anatomy
2. Body planes and cavities
3. Cell
4. Tissue
5. Tissue
6. Skeletal system-axial
7. Skeletal system-appendicular.
8. Joints
9. Muscular system.
10. Muscular system
11. Integumentary system (Hair and Nail).
12. Circulatory system- Heart
13. Heart
14. Arterial system.
15. Venous system
16. Lymphatic system
17. Mouth, pharynx and esophagus.
18. Stomach
19. Small and large intestines.

20. Liver and spleen
21. Respiratory system-Upper
22. Respiratory system-Lower
23. Urinary system-kidneys.
24. Ureter
25. Urinary Bladder
26. Spinal cord.
27. Spinal nerves
28. Cranial nerves
29. Meninges
30. Medulla Oblongata.
31. Pons & Mid brain.
32. Cerebellum.
33. Diencephalon
34. Cerebrum
35. Ventricles of brain and CSF circulation.
36. Autonomic nervous system.i
37. Special senses-structure of eye.
38. Structure of eye.
39. Structure of ear
40. Tongue
41. Endocrine system – pituitary gland
42. Thyroid and parathyroid glands
43. Pancreas and adrenal gland
44. Male reproductive system
45. Female reproductive system

Sr. No.	**List of Learning Resources for the Module**

1.	
2.	

Module Name:

INTRODUCTION TO PHYSIOLOGY

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____

LEARNING OBJECTIVES:

- To introduce the objectives of B.Sc Medical Technology
- To describe the normal Physiology of the human body.
- To describe the normal homeostasis and adaptation of the body.
- To describe the Physiology of the different systems of the body.

Sr. No.	Contents
1.	Introduction of the course.
2.	Introduction to Physiology of body.
3.	Homeostasis and adaptation.
4.	Cell, tissue and membrane Physiology.
5.	Basic Physiological processes.
6.	Blood, blood groups, haemoglobin and immunity.
7.	Nerve Physiology and autonomic nervous system.
8.	Muscle Physiology.
9.	The circulatory system, heart, arterial system and venous system.
10.	Urinary system, structure and function of nephron, process of urine formation, micturition, water and electrolytes balance.
11.	Respiratory system, Physiology of upper and lower respiratory system, lungs volume and capacities, transport of gases, control of respiration.
12.	Physiology of high altitude and deep sea diving.
13.	The digestive system, structure and function of GIT, formation and control of saliva, gastric juice, bile and pancreatic juice, motility of GIT and its control.
14.	Endocrine system, mechanism of action of hormone, hypothalamus, pituitary, thyroid,

	parathyroid, pancreas and adrenal gland hormones.
15.	Reproductive system, female reproductive cycles, pregnancy and lactation, male reproductive system.
16.	Special senses, Physiology of vision, audition, olfaction and gestation.
17.	Nervous system, central and peripheral nervous system, formation and circulation of CSF in brain.

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

BIOCHEMISTRY

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. ____

Sr. No.	**Contents**
1.	Biochemical philosophy
2.	Acid base balance
3.	Blood gas analyzer
4.	Fluid and electrolyte balance
5.	Molecular organization of proteomics
6.	Molecular organization of glycomics
7.	Molecular organization of lipomics
8.	Enzymology & biological oxidation
9.	Endocrinological organization

10.	Vitamins, minerals and nutrition
11.	Practical diagnostic biochemistry
12.	Biochemical philosophy
13.	Acid base balance

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

PHARMACOLOGY & TOXICOLOGY

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____
Learning Objectives:

By the end of this module, students should be able to:

- Describe basic principles of administration of drugs and dosage forms.
- Recall basic principles of pharmacokinetics and pharmacodynamics
- Comprehend terminology relating to pharmacology
- Identify groups of drugs used in common diseases of different body systems.
- Describe effects, adverse effects, indications and contraindications of prototype drugs.
- Understand need and importance of emergency and life saving drugs.

Contents
Introduction to pharmacology * Historical background * Routes of administration * Dosage forms * Pharmacokinetics * Pharmacodynamics * Terminology : definitions with examples * Adverse drug effects

- Gastrointestinal treat (GIT)
    * Antiemetics
    * Antiulcer drugs
    * Purgatives

- Respiratory system
    * Antitussives and mucolytics
    * Bronchodilators and other drugs for asthma
    * Antihistamines and drugs for common cold

- Kidney
    * Diuretics

- Chemotherapy
    * Antibacterial agents
    * Antiprotozoal agents
    * Antiseptics and disinfectants

- Non Steroidal Anti inflammatory drugs (NSAIDs)

- Cardiovascular system (CVS)
    * Antianginal drugs
    * Antihypertensives

- Central Nervous System (CNS)
    * Sedative Hypnotics
    * Local anesthetics
    * General anesthetics
    * Analgesics

- Endocrinology
- * Insulin and antidiabetics
  * Cortico steroids

- Drugs for emergency use.

  * Adrenadine
  * Dopamine
  * Atropine

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

GENERAL PATHOLOGY

Module No: 02

Year No: 03

Module Incharge:
Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____

Learning Objectives

1. Describe the responses to different types of injury at the cellular and subcellular level
2. Enlist the differences between necrosis and apoptosis.
   Describe different morphological patterns of tissue necrosis
3. Describe the different types of responses of the cells to stress.
4. Describe the different types of exogenous and endogenous pigmentations.
5. Describe the sequence of vascular changes in acute inflammation (vasodilation, increased permeability) and their purpose.
6. Define the terms edema, transudate, and exudate.
7. Describe the steps involved in phagocytosis and the role of IgG and C3b as opsonins and receptors.
8. Compare and contrast acute vs chronic inflammation with respect to causes, nature of the inflammatory response, and tissue changes10. Describe the differences between the various cell types (ie, labile, stable, and permanent cells) in terms of their regeneration potential. List examples of each cell type.
9. Distinguish between fibrinous, purulent, and serous inflammation. Define an abscess.
10. Describe the systemic manifestations of inflammation and their general physiology, including fever, leukocyte left shift, and acute phase reactants
11. Define and understand the process of excessive growth of different types of cell

Contents

Hyperplasia

2. Hpertrophy
3. Atrophy
4. Metaplasia
5. Cell injury and cell death
6. Causes of Cell injury
7. Mechanisms of cell injury
8. Reversible and irreversible cell injury
9. Morphology of cell injury and necrosis
10. Apoptosis
11. Sub cellular responses to injury
12. Intracellular accumulations
13. Pathological calcification

2.Inflammation and healing

1. Acute Inflammation
2. Chemical mediators of inflammation
3. Outcomes of acute inflammation
4. Morphologic patterns of acute inflammation
5. Systemic effects of inflammation
6. Mechanisms of tissue regeneration
7. Repair by healing ,scar formation and fibrosis

3.Hemodynamic disturbances,

1. Edema
2. Hyperemia and congestion
3. Hemorrhage
4. Hemostasis and thrombosis
5. Embolism
6. Infarction

4-Shock

1. Differentiate the non neoplastic excessive and neoplastic growths

2. Understand the differences between benign and malignant tumors
3. Understand the classification of different tumors
4. Understand the TNM classification of malignant tumors
5. Define and describe hyperemia and congestion ,edema, ,hemorrhage, thrombosis, infarction and embolism ,
6. Describe shock. And its different types .Understand the mechanisms leading to shock.
7. Describe the organization of nuclear material, its replication and division.
8. Understand different modes of inheritance
9. Describe the the different types of genetic aberrations.
10. Understand the basis of molecular diagnosis of genetic disorders
11. Define the components of the immune system.
12. Understand the innate and adaptive immunity, the classes of immunoglobulins.
13. Define humoral and cellular immunity.
14. Define the differences between immunity and hypersensitivity.
15. Describe the autoimmune diseases and their diagnosis.
16. Understand the immune deficiency states

5-Diseases of immunity

1. General features of immune system
2. Cells and tissues of the immune system
3. Innate and adaptive immunity
4. Disorders of the immune system
5. Autoimmune diseases
6. Immunological deficiency syndromes

6-Neoplasia

1. Benign and Malignant Neoplasms
2. Biology of tumor growth
3. Molecular basis of cancer
4. Host defenses against tumors
5. Clinical features of tumors

7-Basis of hematology

1. Anemia’s
2. Leukemia
3. Coagulation disorders

Practical:

- Concept of basic procedures in Microbiology (Bacteriology, Virology, Parasitology & Sterilization
- Concept of basic procedures in Hematology & Blood Banking
- Concept of basic procedures in Chemistry

Sr. No.	List of Learning Resources for the Module
1.	
2.	

12.1.1 YEAR 1 SEMESTER II

BASIC ENGINEERING SCIENCES

S.No	MODULE TITLE	CREDIT HOURS	CONTACT HOURS	WEEKS
1.	BIOSTATISTICS			2
2.	PHYSICS			3
3.	CHEMISTRY			3
4.	COMPUTER			3
5.	ISLAMYAT			2
6.	STATISTICS / DYNAMICS			2
7.	ENGLISH			2
8.	PAKISTAN STUDIES			2

Year I Semester II

Module Name:

BIOSTATISTICS, EPIDEMIOLOGY & RESEARCH

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. ____

LEARNING OBJECTIVES

To introduce the basic methods and ideas of medial statistics.

How to conduct to research.

How to apply statistical methods in a medical research into their practical context.

How to decide on an appropriate sample size and to use the computer in biostatistics.

How to interpret the result.

How to write the report.

Contents

1.5 Population and samples

1.6 Definition of Data

1.7 Data Analysis and presentation of results

2. Presentation of Data

2.1 Introduction

2.2 Frequency (Qualitative Data)

2.3 Frequency Distributions (Quantitative Data)

2.4 Histogram

2.5 Pie chart

2.6 Frequency Polygon

2.7 Frequency Distributions of the Population

2.8 Shapes of frequency distributions

2.9 Scattered Diagram

3. Measures of locations

3.1 Arithmetic mean

3.2 Median

3.3 Mode

3.4 Geometries Mean

3.5 Quartiles

4. Measures of Variation

4.1 Introduction

4.2 Range

4.3 Standard deviation

4.4 Quartile deviation

4.5 Mean deviation

4.6 Standardized Variable

4.7 Co-official of variation

4.8 Skewness

5. Probability

5.1 Introduction

5.2 Probability calculations

5.3 Multiplicative rule

5.4 Additive rule

5.5 Binomial Distribution

5.6 Poisson Distribution

5.7 Normal Distribution

6. Confidence interval for mean

6.1 Introduction

6.2 Large Sample case (Normal Distribution)

6.3 Smaller Samples

6.4 Confidences interval using t-distribution

6.5 Severe non Normality

6.6 Summary of Alternatives

7. Statistical Inference

7.1 Estimation

7.2 Point estimation

7.3 Standard error

7.4 Interval estimation

7.5 Testing of Hypothesis

7.6 P-Value

7.7 Calculation of required Sample size

8. Significance tests for a single mean

8.1 Introduction

8.2 t-test

8.3 Pared t-test

8.4 Relation between Confidence intervals and significance tests

8.5 One sided and two sided tests

8.6 One simple t-test

8.7 Normal test

9. Comparison of two Means

9.1 Introduction

9.2 Sampling distribution of difference between two means

9.3 Normal test (Large Sample or known standard deviation)

9.4 t-test (Small samples, equal standard deviation)

9.5 Small samples, un-equal standard deviation

10. Comparison of several Means Analysis of Variance – Analysis of variance

10.1 Introduction

10.2 One way Analysis of variance

10.3 Assumptions

16.4 Information Bias

16.5 Sensitivity and specificity (screening test)

16.6 Relations Ship between sensitivity and specificity

17. Research and methodology

What is research

Why we need research

Advantages of doing research

Identification of research needs

Selection of topic

Formulation of objectives

Work plan

Budgeting

Literature research

18. Epidemiology

Introduction

Cohort studies

Relative risk

Attributable risk

Incidence rate, incidence risk and odds ratio

Case-control studies

Matched designs

19. Sampling Methods

19.1 Introduction

19.2 Simple random sampling

19.3 Systematic Sampling

19.4 Stratified Sampling

19.5 Multistage Sampling

19.6 Cluster Sampling

19.7 Sampling and non Sampling error

20. Use of Computer in Research

20.1 Role of Computer based Statistical Packages in Biostatistics

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

PHYSICS

Module No: 02
Year No: 03
Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____Learning Objectives

Contents

1. Introduction to physics
2. Magnetic Resonance Imaging
3. Images from radioactivity: radionuclide scans
4. Diagnostic x-rays and CT-scan;
5. Applied Medical Physics
6. Biomedical measurements:
7. Physics in Medicines:
8. Biomedical applications of physics including
9. Physics of Human Body
10. Nuclear Physics

11. Atomic Physics

12. Electricity

13. Optics:

14. Waves and Oscillations

15. Fluid Dynamics

16. Mechanics

Sr. No.	List of Learning Resources for the Module
1.	
2.	

MATERIALS & BIOMATERIALS

Module No: __15___ Year No. _1___

Module Title: _Materials & Biomaterials

Module Incharge _____

Duration Wks____03 Weeks_____ Hrs. ___120_____ Credit. ____7.5_____

Learning Objectives

Contents

10. Soft tissue biomaterials

11. Orthopedic implants

Sr. No.	List of Learning Resources for the Module
1.	
2.	

PRINCIPLES OF MECHANICS & BIOMECHANICS

Module No: __16___ Year No. _1___

Module Title: Principles of Mechanics & Biomechanics

Module Incharge _____

Duration Wks____03 Weeks_____ Hrs. ___120_____ Credit. ____7.5_____

Learning Objectives

Contents

1. Introduction to Bio-Mechanics
2. Basic Biomechanics (Planes)
3. Basic Bio-Mechanics (Anatomical Positions)
4. Basic of Biomechanics
5. Biomechanics of bones (Musculo-Skeleton System)
6. Joints and their classification

7. Muscles and Muscle Action
8. Lever
9. Manual Muscle Testing (MMT)
10. Viscoelasticity
11. Anatomy, Muscles and Biomechanics of Shoulder Joint, Elbow Joint, wrist and hand, hip joint, knee joint, ankle and foot, thoracic cage and spine, c-spine, c-spine, lumber vertebra, temporo-mandibular joint.
12. Diet and obesity control speech therapy.

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

COMPUTER CONTROLS, IT AND AUTOMATION

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____

Learning Objectives

Contents

1. To know the basic of computer
2. How to operate the computer
3. To make Word files
4. To make power point presentation
5. How to make internet connection
6. How to send email
7. How to get any reference from different websites
8. How to enter data for research

Sr. No.	List of Learning Resources for the Module
1.	
2.	

BIOTECHNOLOGY

Module No: __18___ Year No. _1___ Semester ___II__

Module Title: Biotechnology

Module Incharge _____

Duration Wks____01 Week_____ Hrs. ___40_____ Credit. ____2.5_____

Learning Objectives

Contents

1. Chromosome and DNA

- Definition of Chromosome
- Types of Chromosome, Telocentric, Acrocentric, Metacentric and submetacentric
- Karyotype
- Double Helical structure of DNA
- Chromosomal theory of Inheritance
- DNA as a Heridity material
- Transformation principle
- Chemical basis of DNA
- Francis Crick model of DNA
- Mycal McCarty experiment
- DNA replication
- Transformation and Transcription
- One gene-One enzyme Hypothesis
- Gene Mutation and Point Mutation

2. Cell cycle

- Define cell cycle
- Interphase
- Mitosis and Meiosis
- Cytokinesis and Karyokinesis
- Significance of Mitosis and Meiosis
- Apoptosis and Necrosis

3. Variation and Genetics

- Definition of gene, Allele, Genotype, Phenotype, Locus, Gene pool, Molecular genetics, Biochemical Genetics and Clinical Genetics
- Dominance relations
- X-linked and Y-linked Traits and inheritance
- Mutations
- Gene Mutation and Point Mutation
- One gene-One enzyme Hypothesis

4. Biotechnology

- Definition of Biotechnology
- How to obtain a gene of interest
- Restriction Enzyme Endonucleases
- Recombinant DNA technology, Principle and usages
- Plasmids as a vector
- Genomic library
- Transgenic Bacteria, Plants and Animals
- Cloning of gene and the entire Animal
- Polymerase Chain Reaction
- Gene sequencing
- Gene therapy

- Human genome project

Sr. No.	List of Learning Resources for the Module
1.	
2.	

PRINCIPLES OF CIVIL ENGINEERING

Module No: __19___ Year No. _1___ Semester ___II__

Module Title: Principles of Civil Engineering

Module Incharge _____

Duration Wks____02 Week_____ Hrs. ___80_____ Credit. ____5_____

Learning Objectives

Contents

1. Mechanics of Materials

   Mechanics of material gives the student basic tools for stress, strains and deflections produce by applied load. To predict failures and understand the physical properties of materials.

2. Engineering Mechanics

   To study the effect of forces and moments acting on rigid bodies, that either at rest or moving with constant velocity along a straight path.

3. Fluid Mechanics

   The course in fluid mechanics that involves the study of fluid flow. The fundamental aspects of fluid motion, fluid properties, flow regimes, pressure variation fluid kinematics.

4. Thermodynamics

To give the basics/fundamentals of thermodynamic properties of substance along with laws of thermodynamics.

5. Instrumentation

To make familiar with use and principle of different measuring instruments.

Sr. No.	List of Learning Resources for the Module
1.	
2.	

HISTORY / PAKISTAN STUDIES

Module No: __20___ Year No. _1___ Semester ___II__

Module Title: History / Pakistan Studies

Module Incharge _____

Duration Wks____01 Week_____ Hrs. ___40_____ Credit. ____2.5_____

Learning Objectives

Contents

مطالعہ پاکستان

پس منظر قیام پاکستان تا قائداعظم کی نظر میں نظریہ پاکستان

نظریہ پاکستان کا تاریخی پہلو تا سیاسی جدوجہد

منزل کا تعین تا تحریک قیام پاکستان

قیام پاکستان کا عمل تا ارض پاکستان

پاکستان اور عالم اسلام

Sr. No.	List of Learning Resources for the Module
1.	
2.	

ISLAMIYAT & ETHICS

Module No: __21___ Year No. _1___ Semester ___II__

Module Islamiyat & Ethics

Module Incharge _____

Duration Wks____01 Week_____ Hrs. ___40_____ Credit. ____2.5_____

Learning Objectives

To get basic knowledge of Islam and its implementation in practical work in medical sciences

To know the ethics of Islam regarding human health

Contents

اسلامیات لازمی

عقیدۂ توحید تا عبادات

امر بالمعروف ونہی عن المنکر تا دعوت دین کا طریق کار

اتحاد امت تا کسب حلال

حقوق العباد تا حصول انصاف کا حق

حقوق نسواں تا خطبہ حجتہ الوداع

اسوۂ حسنہ سیرت طیبہ تا وصال نبی پاک ﷺ

نبی کریم ﷺ بحیثیت معلم تا نبی کریم ﷺ بحیثیت تاجر

Sr. No.	List of Learning Resources for the Module
1.	

2.	

YEAR 2 Semester III

APPLIED MEDICAL SCIENCES

S.No	MODULE TITLE	CREDIT HOURS	CONTACT HOURS	WEEKS
1.	Abdomen Pelvis and Lower Limb Anatomy	2.5	67	2
2.	Thorax and upper limb anatomy	2.5	67	2
3.	Head and Neck Anatomy	2.5	67	2
4.	Blood and CVS Physiology	2.5	67	2
5.	Respiratory Physiology	2.5	67	2
6.	GIT and Endocrinology Physiology	2.5	67	2
7.	Antibiotics and NSAIDs	2.5	67	2
8.	Drugs acting on CNS and ANS	2.5	67	2
9.	Drugs acting on CVS	2.5	67	2
10	Pathology of CVS and Lymphoid System	2.5	67	2
11	Diseases of GIT, Liver, Gallbladder and Biliary Tract	2.5	67	2
12	Diseases of Lungs and Kidneys	2.5	67	2

Module Name:

ABDOMEN, PELVIS AND LOWER LIMB ANATOMY

Module No: 01

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

THORAX AND UPPER LIMB ANATOMY

Module No: 02

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- Skeleton of the Thorax, name of the bones and Radiograph of the Thorax
- Superior and Inferior aperture of the thorax (Draw and label the structures passing through the diaphragm
- Thoracic wall and its coverings
- Blood supply and lymphatic drainage of the chest wall
- Trachea, Bronchi, Pleura, Lungs and structures related to mediastinal surface of the lung (only labeled diagram)

- Difference between right and left lung and blood supply of the lungs
- Mediastinum and its contents draw and label
- Pericardium and structures of the heart (with labeled diagram)
- Blood supply of the heart (Draw and label)
- Formation of the superior Vena Cava with Labeled diagram
- Thoracic aorta & its major branches (Draw and label)
- Esophagus & Thoracic Cavity (Their course in the Chest Cavity)
- Skeleton of the upper limb, name of the bones with labeled diagram
- Structures of the breast, its extent, blood supply and lymphatic drainage
- Axilla, boundaries and its contents
- Shoulder joint (Draw and Label the structures) + Radiograph
- Brachial Plexus and Nerve Supply to the Arm
- Blood supply and lymphatic drainage of the upper limb
- Muscles of scapular/pectoral region and their actions
- Muscular compartment of the arm
- Nerve supply of the for arm and the hand
- Spaces of the hands

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

HEAD AND NECK ANATOMY

Module No: 03

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- Draw and label the cranial and facial bones
- Meninges, Dura, pia and Arachnoid matter of brain
- Draw and label the major parts of brain and their blood supply of the brain
- Cranial Nerves
- Draw and label the structures of external, middle and inner ear
- Bones of neck the cervical vertebrae and hyoid bone and muscles of neck (only label)
- Blood supply of the head and neck
- Teeth and Tongue
- Salivary Glands
- Pharynx larynx and trachea
- Nose
- Thyroid and parathyroid Gland

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

BLOOD AND CVS PHYSIOLOGY

Module No: 04

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- Blood
  - Red blood cells, anemia, and polycythemia
  - Resistance of the body against diseases
    - Leukocytes, granulocytes
    - Monocyte-macrophage system
    - Inflammation
  - Resistance of the body to infection
    - Immunity and Allergy
  - Blood types
    - Transfusion
    - Tissue and Organ Transplantation
    - Hemostasis and Blood Coagulation
- Cardiovascular System
  - Heart
    - Cardiac Muscles and valves
    - Rhythmical Excitation of the heart and Normal Electrocardiogram
    - Cardiac Arrhythmias
  - Circulation
    - Overview of the circulation
    - Functions of arterial and venous system
    - Local and Humoral control of tissue blood flow
    - Role of kidneys in controlling arterial blood flow

- Regulation of Cardiac output and venous return
- Cardia failure
- Circulatory shock and its treatment

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

RESPIRATORY & GIT PHYSIOLOGY

Module No: 05

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- Respiration
  - Overview of Respiration
  - Pulmonary ventilation
  - Overview of Pulmonary Circulation, Pulmonary Edema and pleura fluid
  - Exchange of CO_2 and O_2 through the respiratory membrane
  - Transport of O_2 and CO_2 in blood and tissue fluid
  - Regulation of respiratory
  - Respiratory insufficiency
- Gastrointestinal tract
  - General principles of Gastrointestinal Function
    - Motility
    - Nervous control
    - Blood circulation
  - Propulsion and missing of food in Alimentary tract
  - Digestion and absorption in the gastrointestinal tract
  - Gastrointestinal disorders

Sr. No.	List of Learning Resources for the Module

1.	
2.	

Module Name:

ENDOCRINOLOGY PHYSIOLOGY

Module No: 05

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- Endocrinology
  - Introduction to Endocrinology
  - Pituitary Hormones and their control by the Hypothalamus
  - Parathyroid hormone
    - Calcitonin
    - calcium and phosphate metabolism
    - vitamin D
  - Thyroid Metabolic Hormones
  - Adrenocortical hormones
  - Insulin, glucagon and Diabetes mellitus

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

CHEMOTHERAPEUTIC DRUGS AND NSAIDS

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____

Learning objectives:

Contents

- Chemotherapeutic Drugs
  - Principles of Antimicrobial Therapy
    - Section of antimicrobial agents
    - Route of administration
    - Drug resistance
    - Prophylactic antibiotics
    - Cell wall inhibitors
      - Penicillins
      - Cephalosporin's
      - Vancomycin
    - Protein Synthesis Inhibitors
      - Aminoglycosides
      - Macrolides
      - Chloramphenicol
      - clindamycin
    - Quinolones, Folic Acid Antagonists, and Urinary Tract Antiseptics
      - Sulfonamides
      - Trimethoprim
      - Co-trimoxazole
    - Antimycobacterial
      - Chemotherapy for Tuberculosis

- Anti-Inflammatory Drugs

- Non-Steroidal Antiinflammatory drugs
- Acetaminophen
- Disease modifying antirheumatic agents
- Autocoids and autacoid angtagonists
    - Histamin H2 receptor blockers
    - Drugs used to treat migrain

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

DRUGS ACTING ON CNS & ANS

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____Learning objectives:

Contents

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

DISEASES OF CIRCULATORY SYSTEM

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____Learning objectives:

Contents

Sr. No.	List of Learning Resources for the Module
1.	

2.	

Module Name:

DISEASES OF GIT

Module No: **02**

Year No: **03**

Module Incharge:

Duration Weeks: ____03 Week_____ Hrs. _____ Credit. _____

Learning objectives:

Contents

Sr. No.	List of Learning Resources for the Module

1.	
2.	

YEAR 2 SEMESTER IV

APPLIED ENGINEERING SCIENCES

S.No	MODULE TITLE	CREDIT HOURS	CONTACT HOURS	WEEKS
1.	Basic Microbiology	3.0	80	2
2.	Clinical Microbiology	3.0	80	2
3.	Applied Microbiology	3.0	80	2
4.	Surgical Equipment's	3.0	80	2
5.	Surgical Supplies in the Operating Room	3.0	80	2
6.	Surgical Instrument	3.0	80	2
7.	Principles of Aseptic and Sterile Techniques	3.0	80	2
8.	Decontamination and Disinfection	3.0	80	2
9.	Sterilization by Physical Methods	3.0	80	2
10.	Sterilization by Chemical Methods	3.0	80	2

Module Name:

BASIC MICROBIOLOGY

Module No: 11

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning Objectives

Contents

- **Introduction to Microorganisms**
- Brief History of Microbiology
  - Anton Van Leeuwen hoek
  - Francesco Redi
  - John Needham
  - Lazzaro Spallanzani
  - Louis Pasture
  - Edwrad Jenner
  - Ignas Semmelweis
  - Golden Age of Microbiology
  - Joseph Lister
  - Robert Koch
  - Hans Gram
  - Chemotheraputic Agents
- Nomenclature of microbiology
- Introduction of Microscope
  - Units of Measure
  - Types of Microscope
- Staining Methods
  - Preparing for Staining
  - Simple Stain
  - Simple Stain
  - Differential Stain
- Culture Mediums
  - Enriched Media
  - Selective Media
  - Differential Media
  - Reducing Media
- **Introduction to cells and cells structures**
- Bacteria
  - Morphology
  - Growth
  - Motility
  - Nutritional Requirements
  - Oxygen Requirement
  - Pathogenicity
  - Metabolisms
  - Proteins
  - Genetics
- Eukaryotic and Prokaryotic Cells
  - Eukaryotes
  - Prokaryotes
- **Genetics and the Classification of Microorganisms**
- Tests for Identifying Microbes
  - Morphology
  - Staining
  - Serology
  - Amino Acid Sequencing
  - Phage Typing
  - Flow Cytometry
  - Nucleic Acid Hybridization
  - Numerical Taxonomy
- Genetics of Microorganisms
  - Mutations
  - Methods of Mutations
  - Mutagens
  - Bacterial Genetic Exchange
- **Microbial Life and Growth**
- Requirements of Viability of Microorganisms
  - Physical Requirements
  - Chemical Requirements
- Microbial Growth
  - Generation Time
  - Logarithmic Graphing of Growth
  - Phases of Bacterial Growth

- Bacterial Count in the Laboratory

- **Infectious Diseases Processed**
- Introduction to Pathogens
- Epidemiology
  - Endemic
  - Epidemic
  - Pandemic
- Reservoirs of Pathogens
- Methods of Transmission
- Portals of Entry
- Contributing Factors to Bacterial Invasion
  - Enzyme
  - Bacterial Capsules
  - Cell Wall Chemical Substances
- Methods Pathogen Use to Damage
  - Host Cells
  - Direct Damage
  - Toxins
- Pathogenicity of Virus
  - Methods of Entry
  - Cytopathic Effects of Viral Infection
- Nonspecific Host Defenses
  - Skin
  - Mucous Membranes
  - Phagocytes
  - Complement system
  - Inflammation
  - Fever
- **Human Microbe Relationship**
- Symbiosis
- Mutualisms
- Commensalisms
- Parasitism
- Pathogenic Relationship
- Non Pathognic Relationship

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

CLINICAL MICROBIOLOGY

Module No: 12

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- **Staphylococcus and Aerobic Gram Positive Cocci**
  - Staphylococcus Aureus
  - Antibiotic Resistance
  - Virulence Factors
  - Disease
- **Staphylococcus and Aerobic Gram Positive Cocci**
  - Streptococcus Pyogenes
  - Pneumococcal Pneumonia
  - Streptococcal Pharyngitis
  - Necrotizing Fascitis
- **Neisseria and aerobic Gram Negative cocci**
  - Neisseria gonorrhoeae
    - Clinical Course of Infection
    - Treatment
  - Neisseria meningitides
    - Immunity
    - Disease
    - Diagnosis
    - Treatment
    - Epidemiology
  - Moraxella
    - Moraxella caterrholis
- **Gram Negative Enteric Bacilli**
  - Escherichia coli
    - Disease
    - Treatment
  - Klebsiella
    - Disease
    - Treatment
  - Salmonella
    - Salmonella typhi
    - Salmonellosis
- **Nor Fermenting Aerobic Gram Negative Bacilli**
  - Pseudomonas aeruginosa
- **Curved Aerobic Gram Negative Bacilli**
  - Helicobacter Pylori
  - Campylobacter
- **Gram Positive Anaerobic Bacteria**
- Clostridium Bacilli
  - Clostridium perfringens
  - Clostridium botulinum
  - Clostridium tetani
- **Mycobacteria**
- Charateristics of Mycobacteria
- Nutritional Requirements
- Growth Rate and Cure
- Mycobacterium tuberculosis
  - Transmission of Disease
  - Disease Progression
  - Skin Testing
  - Treatment and Immunization
- Mycobacterium laprae
- Implication for the surgical Technologist
- **Virology**
- **Introduction to Viruses**
  - Characteristics of Viruses
  - Infection by Viruses
  - Lysogenic and Lytic Cycles
  - Interferons

- Bacteriophages
- Latent Infections
- Vaccination
- Implication for the Surgical Technologist
  - **Most Significant Virus**
- Herpes viruses
  - Herpes simplex virus
    - a-Zoster Virus
  - Cytomegalovirus
  - Human Herpes Virus 6 and 7
- Enteroviruses
  - Poliovirus
  - Coxsackie virus
- Respiratory Viruses
  - Paramyxo viruses
  - Influenza A
- Hepatitis Viruses
  - Hepatitis A Virus
  - Hepatitis B Virus
  - Hepatitis C Virus
  - Hepatitis E Virus
- Human Immunodeficiency Virus
- **Emerging Viral Infection**
- Viral Hemorrhagic Fevers
  - Ebola Hemorrhagic Fever
  - Dangue (Hemorrhagic) Fever
  - Lassa fever
- Implication for the Surgical Technologist

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

APPLIED MICROBIOLOGY

Module No: 13

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

Part I

Health care associated infections and Antimicrobial resistance: Infections that patient acquire during the course of receiving treatment for other conditions within a healthcare setting like Methicillin Resistant Staphylococcus aureus infections, Infections caused by Clostridiuium difficle, Vancomycin resistant enterococci etc. Catheter related blood stream infections, Ventilator associated pneumonia, Catheter Related urinary tract infections, Surveillance of emerging resistance and changing flora. The impact and cost attributed to Hospital Associated infections.

Part II

Disease communicable to Healthcare workers in hospital set up and its preventive measure: Occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella-zoster, respiratory synctial virus etc), blood borne transmission (HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc), oro faecal route (Salmonella, Hepatitis A etc), direct contact (Herpes Simplex Virus etc). Preventive measures to combat the spread of these infections by monitoring and control.

Part III

Microbiological surveillance and sampling: Required to determine the frequency of potential bacterial pathogens including Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis and to assess the antimicrobial resistance. Sampling: rinse technique, direct surface agar plating technique.

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

SURGICAL EQUIPMENT'S

Module No: 14

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

This module will covers

- Components of Operating Room Attire and their Significance
- Operating Room Furniture their use and troubleshooting
- Types of endoscopic Equipment's, their handling and care
- Application of laser in the surgery

Contents

Outcomes

At the completion of this module the learner will be competent enough to

- Clearly Identify operating room attire and their use
- Understand and identify and appropriate use of the operating room furniture
- Sort out the surgical equipment timely manner for the surgical procedure
- Troubleshoot the common faults in the equipment

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

SURGICAL SUPPLIES IN THE OPERATING ROOM

Module No: 15

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

This module will covers

- Various type of Surgical Supplies
- Different types surgical tubes and their uses
- Types of Suture Materials and their uses
- Types of solutions used in Surgery

Contents

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

SURGICAL INSTRUMENTS

Module No: 16

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

- Describe the characteristics of the Tissue
- Identify Classifications of instruments
- Differentiate types of instruments by their functions
- Identify different types of finishes on Surgical instruments
- Describe the care and handling of instruments
- Describe several methods of learning about instruments
- Develop a personal plan for learning instruments

Contents

- Non-Crushing Vascular Clamps

- Exposing and Retracting
  - Handheld Retractors
  - Malleable Retractors
  - Hooks
  - Self-Retaining Retractors
- Suturing or Stapling
  - Needle Holders
    - Tungsten Carbide Jaws
    - Crosshatched Serrrations
    - Smooth Jaws
  - Staplers
  - Clip Appliers
  - Terminal End Staplers
  - Internal Anastomosis Staplers
  - End-to-End Circular Stapler
- Viewing
  - Speculums
  - Proctoscopes
  - Endoscopes Hollow Endoscopes
  - Lensed Endoscopes
- Suctioning, Irrigating and Aspirating
  - Suction
  - Poole Abdominal Tip
  - Frazier Tip
  - Yankauer Tip
- Dilating and Probing
- Measuring Accessory Instruments
  - Mallet
  - Screw Drivers
- Powered Surgical Instruments
  - Air-Powered Instruments
  - Electrically Powered Instruments
  - Battery Power
- Handling Instruments
  - Tissue Characteristics
  - Setting Up the Instrument Table
  - Handling the Instrument During the Surgical Procedure
  - Dismantling the Instrument Table.

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

PRINCIPLES OF ASEPTIC AND STERILE TECHNIQUES

Module No: 17

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- **Microbiologic Considerations**
  - Historical Background
  - Microorganisms: Non-Pathogens Versus Pathogens
    - Identification of Microorganisms
    - Viability of Microorganisms
    - Three Lines of Defenses
    - Pathogenic Invasion
    - Infectious Processes in the Body
    - Who is at Risk of Exposure
    - Biofilm Formation
    - Mandatory Reporting of Health Care-Aquired Infections
  - Types of pathogenic Microorganisms
    - Bacteria
      - Common Microorganisms in the Operating Room Environment
      - Characteristics
      - Bacterial Toxicity
      - Examples of Bacterial Diseases
    - Viruses
      - Characteristics
      - Examples of Viral Diseases
    - Fungi
      - Characteristics
      - Examples of Fungal Diseases
    - Protozoa
      - Characteristics
      - Examples of Protozoal Diseases
  - Antimicrobial Therapy
- **Principles of Asepsis and Sterile Technique**
  - Historical Background

- Difference b/w asepsis and sterile Technique
- Transmission of Microorganisms
- Human-borne Sources of Transmission
    - Skin
    - Hair
    - Nasopharynx
    - Human Error
    - Cross-Infection
- Non-Human Factors in Contamination
    - Fomites
    - Air
- Risk for the Surgical Site Infection
    - Criteria for Defining SSI
    - Physiologic Risks for Surgical Site Infection
- Activities that Promote Asepsis
- A septic Technique and Environmental Controls
    - Environmental Services/Housekeeping
    - Control of Air born Contamination
        - Air-Conditioning System
        - Laminar Air System
        - Doors
        - Traffic and Movement
        - Lint
    - Isolation Precautions
- Standard Precautions
- Application of Sterile Technique
    - Levels of Sterility and Disinfection
        - Critical
        - Semi-Critical
        - Non-Critical
- Principles of Sterile Technique
    - Only Sterile Items are Used Within the Sterile Field
    - Sterile Personnel are Gowned and Gloved
    - Tables are Sterile only at table level
    - Sterile Personnel's /Sterile Items
    - Unsterile Personnel's/ Sterile field
    - The Edges of anything that Encloses Sterile Contents are Considered Unsterile
    - The Sterile Field is created as close as Possible to the Time of Use
    - Sterile Areas are Continuously Kept in view

        - Sterile Personnel Keep Well Within the Sterile Area
        - Sterile Peronnel Keep Contact with Sterile Areas to a Minimum
        - Destruction of the Integrity of Microbial Barriers Results in Contamination
        - Microorganisms Must be Kept to an Irreducible Minimum
- **Appropriate Attire, Surgical Hand Cleansing, Gowning and Gloving**
    - Historical Background
    - Appropriate Operating Room Attire
        - Definition
        - Purpose
        - Considerations
        - Components of Appropriate Attire
            - Body Cover
            - Head Cover
            - Shoe Covers
            - Masks
            - PPE (Personal Protective Equipment
                - Aprons
                - Eyewear
                - Gloves
            - Surgical Gowns
            - Surgical Gloves
        - Criteria for Surgical Attire
- Standards for Personal Hygiene and Attire
- Surgical Hand and Skin Cleansing
    - Microbiology of the Skin
    - Purpose of Surgical Hand and Skin Cleansing
    - Scrub Sink
    - Equipment
    - Antimicrobial Skin Cleansing Agents
        - Chlorhexidine Gluconate
        - Iodophors
        - Triclosan
        - Alcohol
        - Hexachlorophene
        - Parachlorometaxylenol
    - Preparation of Surgical Hand Cleansing
    - Opening the gown and Gloves
    - Preparations Immediately Before Surgical Hand Cleansing
    - Surgical Hand and Arm Scrub with a Brush

- Agents Used for the Hand Washing
- When to Hand wash
- Hand washing Technique
- Surgical Scrub and Scrubbing Technique
- Brushless/Waterless Surgical Hand Cleansing

❖ Gowning and Gloving
- Purpose
- General Considerations
- Drying the Hands and Arms
- Gowning and Gloving Techniques
  - Gowning
  - Open and Closed Gloving Techniques
  - Assisted Gowning and Gloving of a Team Member
  - Removing or Changing Contaminated Gown and Gloves
  - Managing Contaminated Gloves or Objects During the Surgical Procedure

❖ Practice of Aseptic Technique
- When to Open the Sterile Items
- Opening Large Packs onto a Table
- Opening Instrument Trays
- Delivering Sterile Goods and Solutions during Surgery
- Opening the Peel Pouches
- Opening the Basins
- Opening Small Items
- Distributing Solutions

❖ Case Studies

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

DECONTAMINATION AND DISINFECTION

Module No: 18

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- Terminology
- Instrument Cleaning and Decontamination
  - Prerinsing/Presoaking
  - Manual Cleaning
  - Washer-Sterilizer/Washer-decontaminator
  - Ultrasonic Cleaning
  - Lubrication
  - Inspecting and Testing
  - Instrument Marking for Identification
  - Repairing or Restoring Versus Replacing Instruments
    - Repair
    - Restoration and Resurfacing
    - Replacement
- Decontamination
  - Decontamination of the Surgical Suite before the Workday
  - During the Surgery
  - After Surgery
  - Case Cart System
  - Decontamination of Furniture and Fixed Equipment
  - Decontamination of Other Areas in the Operating Room
    - Daily Cleanup
    - Weekly Cleanup
  - Decontamination of Surgical Instruments
- Types of Chemical Disinfectants
  - Alcohols
  - Aldehydes
  - Phenols
  - Halogens
  - Organic Acids
  - Oxidizing agents (Hydrogen peroxide)

    - Quarternay Ammonium Compounds
    - Heavy Metals derivatives
- Mechanism of action merits and demerits of selected disinfectants
- Selection and Use of Chemical Disinfectants
- Precautions and Hazards
- Disinfection of the Operating Room

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

STERILIZATION BY PHYSICAL METHODS

Module No: 19

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives

Contents

- Historical Background
  - Sterilization Versus Disinfection
- Sterilization
  - **Sterility and Sterility assurance**
  - Reliability Parameters for Sterilization
  - Methods of Sterilization
  - Sterilization Cycle
  - Monitoring the Sterilization Cycle
  - Assembly of the Instrument Sets
  - Packaging instruments and Other Items for Sterilization
    - Instrument Packing
      - Packaging Considerations
      - Packaging Materials and Methods
- Thermal Sterilization
  - Sclient Features
  - Transfer of Heat
  - Boiling
  - Effect of Steam Under Pressure on Microbial Population
  - Steam Under Pressure Sterilization (Moist Heat Sterilization/ Autoclaving)
  - Types of Autoclaves
    - Gravity Displacement
    - Prevaccum Sterilizer
    - Flash/High-Speed Pressure Sterilizer
  - Advantages and Disadvantages of Steam Sterilization Methods
  - Types of Steam Sterilizers and their cycles
  - Precautions for Safe Operation of Sterilizer
    - Preparing items for steam sterilization
    - Timing the Load
    - Drying the Load

        - Testing of Autoclaves by Physical, Chemical and Biological Methods
        - Applications of Autoclaves
        - Validation and Control of Steam Sterilization
        - Some Autoclave Problems
    - Dry Heat Sterilization
        - Effects of Dry Heat on Microorganisms and Bacterial Endotoxins
        - Application of Dry Heat Sterilization
        - Hot Air Oven
        - Advantages & Disadvantages
        - Types of Dry Heat Sterilizers
        - Preparing Items for Dry Heat Sterilization
            - Oils
            - Talc
        - Packaging materials for Dry Heat Sterilization
        - Loading the Sterilizer
        - Timing the Load
        - Biologic Testing of the Dry Heat Sterilizer.
        - Validation and Routine Control of Dry Heat Sterilization
    - Pasteurization and its Steps
    - Filtration
        - Membrane Filters
        - HEPA Filters (High Efficiency Particulate Air Filter)
    - Cold
    - Desiccation
    - Osmotic Pressure
- Radiation Sterilization
    - Radiation and Radioactivity
    - Effect of Radiation on Microorganisms
    - Microwave Sterilization
    - Gamma Ray
    - Beta Particle Sterilization
    - Ultraviolet Radiation
    - Sterilization by Radiation
        - Effectiveness of Sterilization by radiation
        - Mechanism of action
        - Biological Testing of Sterilization by radiation
        - Merits and demerits of radiation sterilization

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

CHEMICAL METHODS OF STERILIZATION

Module No: 20

Year No: 02

Module Incharge:

Duration Weeks: 02 Contact Hrs: 80 Credit: 3.0

Learning objectives:

Contents

- Chemical Sterilization
- EO (Ethylene Oxide) Gas Sterilization
  - Overview
  - Mode of Action
  - Inactivation Effects on Microorganisms and Microbial Populations
- Effect of Gas concentration, Temperature and Humidity on Microbial inactivation
  - Microbiicidal Activity
  - Applications of Ethylene Oxide Sterilization
  - Advantages & Disadvantages
  - Preparation and Inspection the items for EO Sterilization
    - Packaging Materials for EO Gas Sterilization
  - Ethylene Oxide Sterilization Processes
  - Loading the Sterilizer
  - Timing
  - Aerating Items after EO Gas Sterilization
  - Precautions and Hazards
- H_2O_2 (Hydrogen Peroxide Plasma Sterilization)
- Ozone Gas Sterilization
- Chemical Sterilants in Solution
  - Containers for Chemical Sterilant in Solution
  - Preparing Items for Sterilization by Chemical Immersion
  - Timing the Immersion Cycle
  - Rising after Immersion
- Control Measures
- Storage and Handling of Sterile Supplies
- Load Control Number
- Wet Packs
- Shelf Life
  - Dust Cover
  - Storage Conditions

    - Rotation of Supplies
- Custom Packs
- Case Cart System
- Current Issues in Sterilization and Disinfection
- Re-Processing of Single Use Items
- Prevention of Transmission of Creutzfeldt-Jakob Disease
- Recommendations for Disinfection and Sterilization in Healthcare Facilities
- Occupational health and Exposure
- Cleaning of Patient-Care Devices
- Indications for Sterilization, High-Level Disinfection, and Low-Level Disinfection
- Selection and Use of Low-Level Disinfectants for Noncritical patient-Care Devices
- Cleaning and Disinfecting Environmental Surfaces in Health Care Facilities
- High Level Disinfection of Endoscope
- Monitoring of Sterilizers
- Storage of Sterile Items
- Quality Control
- Case Studies

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

YEAR 3

S.No	MODULE TITLE	CREDIT HOURS	CONTACT HOURS	WEEKS
1.	Introduction to Surgical Technology	4.5	120	3
2.	Communication and Team work	4.5	120	3
3.	Patient transport and Positioning in Operation Theatre	4.5	120	3
4.	Pre-Operative Laboratory Investigations	4.5	120	3
5.	Pre-Operative Radiologic investigations	4.5	120	3
6.	Pre-Operative Care	4.5	120	3
7.	Operating Room Techniques	4.5	120	3
8.	Intra and Post-Operative Care	4.5	120	3
9.	Trauma and its Management	6	160	4
10.	Clinical Surgery I	4.5	120	3
11.	Clinical Surgery II	4.5	120	3
12.	Surgical Procedures I	4.5	120	3
13.	Surgical Procedures II	4.5	120	3

Module Name:

INTRODUCTION TO SURGICAL TECHNOLOGY

Module No: 01

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

In this module students will

- Gain Understanding of the development of the surgical technology
- Understand the role and responsibilities of the ORPs (Operating Room Personnel's)
- Be acknowledged about differences between delgation an assignment
- Be provided with the concept of patient centered care and Maslow's hierarchy of patient Needs
- Knew the importance of specific needs of the surgical patients
- Understand role of culture and therapeutic communication in appropriate patient care
- Learn role of law and hospital policies in patient care
- Learn about the importance of documentation in the health care settings
- Also gain knowledge about the ethics and their conflicts
- Gain an idea how hospital administration and Organization works and roles of

Contents

- Evolution of the Profession
- Desirable Attributes for Success
    - Care and empathy
    - Respect for others
    - Emotional Self-Control
    - Honesty and Ethical Behavior
    - Manual Dextrity
    - Organizational Skills
    - Concentration
    - Problem Solving Skills
    - Sense of humor
- Scope of Practice and State Jurisdiction
- Task and Responsibilities of the Surgical Technologists
    - Delagation of Tasks and Responsibilities
    - Duties of Non-Sterile Surgical aTechnologists
    - Duties of Sterile Surgical Technologist
    - Surgical Technologist as a Preceptor
- Patient Centered Care
- Critical Thinking
- Direct and Indirect Care
- Maslow's Hierarchy of Patient's Need
- Guidelines for the Therapeutic Communication
- Law and Ethics
    - Sources of Law and ethics
    - Law Versus Recommended Practice
    - Federal Regulations
    - Health care policy and Procedures
    - Legal Doctrines
- Torts (Civil Liability)
    - Negligence (Unintentional Tort)
        - Retained Objects

        - Burns
        - Improper Positioning
        - Patient Identity and Operative Site
        - Specimen Handling
        - Medications
        - Abandonment
        - Failure to Communicate
        - Loss of Patient Property
    - Intentional Torts
        - Invasion of Privacy
        - Defamation
        - Civil Assult
        - Civil Battery
        - False Imprisonment
    - Criminal Liability
        - Actions Exceeding Scope of Practice
        - Theft
    - Need for Legal Representation
        - Subpoena
        - Summons
        - Judgment
    - Documentation
        - Operative Report
        - Informed Consent form
        - Who can sign the consent form
        - Witness the consent signing
        - Incident report
        - Advance directive
        - Do not Resuscitate
        - Organ Donation
        - Living Will
        - Medical Power of Attorney
    - Ethics
    - Combined Ethical and Legal Cooncerns
    - Ethical Dilemmas
- Hospital Administration and Organization
    - Health Care facilities
    - Hospital Administration
        - Mission Statement
        - Organization of Professional Chain of Command
        - Organizational Chart
        - Hospital Management
        - Hospital Policy
        - Hospital Accreditation
        - Hospital Ancillary Services and Departments
        - Operating Room Personnel's

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

COMMUNICATION AND TEAM WORK

Module No: 02

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

- Describe the terms used in communication
- Describe the meaning of content and tone in communication
- Role play situations to demonstrate assertive behavior
- Description of body language and its meaning
- How to develop active learning skills
- Describe the qualities of good teamwork
- Describe how poor teamwork results in poor patient care
- Describe three approaches to conflict solving

❖ **Contents**

❖ Introduction to terminology
❖ Reason for studying communication
❖ Elements of Communication
❖ Verbal communication
  - Guidance for Verbal Communication

❖ Non-verbal Communication
  - Touch
  - Silence and Stillness
  - Listening

❖ Qualities of good communication
❖ Cross cultural differences among major ethnic Groups
❖ Problem Behavior
  - Verbal Abuse
  - Cause of Verbal Abuse
  - Coping with the Verbal Abuse
  - Complaining
  - Coping with people who complains
  - Gossip and Rumors
  - Coping with Gossips and Rumors
  - Criticism
  - Coping with criticism

❖ Team work
  - Qualities of a good teamwork
  - Discussion of conflicts
  - Yielding
  - Acceptance of change
  - Politeness
  - Collaboration

❖ Team problems
  - Conflicts between team members
  - Conflicts between Team Goals and Personal Goals
  - Conflicting Priorities
  - Role Confusion

❖ Surgical Ethics
  - Introduction
  - Respect for autonomy
  - Research
  - Maintaining standards of Excellence

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

PATIENT TRANSPORT AND POSITIONING IN OPERATION THEATRE

Module No: 03

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

- Identify how to incorporate safe body mechanics in to patient transport, transfer, and positioning
- Describe the responsibilities of surgical technologist in patient transport and transfer
- Use the correct procedure to identify the patient
- Demonstrate how to assist a patient from a bed to a wheelchair
- How to ease a patient to the ground in the event of fall
- Demonstrate the transfer of a patient from stretcher to the operating table
- Transfer of a semiconscious patient from the table to the stretcher
- Describe the use of common operating table accessories
- Describe the consequence of nerve and blood vessel compression
- Identify the methods to prevent injury to the patient
- Participate in commonly used methods of patient positioning

Contents

- Introduction
- Body Mechanics
- Anatomic and physiologic considerations
- Guidelines to prevent injury
- Principles of safe patient transport and transfer
  - Patient identification
- Assisting the ambulatory patient
  - Transferring a patient from a bed to a wheel chair
  - Assisting a patient from a lying to a sitting position
  - Transferring a mobile patient from a bed to a stretcher
- Positioning the surgical patient
- General principles of patient positioning
- General Operating Table and accessories
- Location of common nerve and vessels
  - Prevention of compression injury
  - Shear injury and pressure ulcers
  - Skeletal injury
    - Normal range of motion of the body extremities
- How to avoid falls from the operating Table
- Patient conditions that influence positioning
- Surgical positions
  - Supine position
    - Physiologic changes associated with supine position
    - Establishing the sitting position
    - complications
  - Lithotomy position

        - Establishing the sitting position
        - Verities of lithotomies position
        - Physiology of the lithotomy position
        - Complications
    - Head elevated positions
        - Sitting position
        - Physiologic changes associated with the sitting position
        - Establishing the sitting position
        - Complications
    - Head down tilt
        - Surgical values of head down tilt position
        - Establishing head down tilt position
        - Complication of head down tilt position
    - Lateral decubitus position and its modifications
        - Estabilishing the lateral decubitus position
        - Establishing the kidney position
        - Physiology of the decubitus position
    - Prone position
        - Verities of prone position
        - Support devices for the prone position
        - Establishing the prone position
        - Physiology of prone position
        - Potential complications
    - Special considerations
        - Positioning the extremities
        - Positioning the head nad neck
- ❖ Patient categories
    - Pathologic Obesity
    - Pediatrics
    - Obstetrics
    - Geriatrics
- ❖ Potential complications

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

PRE-OPERATIVE LABORATORY INVESTIGATIONS

Module No: 04

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

Contents

- Introduction to the Diagnostic Procedures
  - Diagnostic procedures and the surgical patient
  - Invasive and Non-Invasive and interventional Testing
  - Preoperative and intraoperative testing
- Vital Signs
- Hematology
  - Plasma
  - RBCs
  - Hemoglobin
  - Hematocrit
  - Red Blood Cell indices
  - WBCs
  - Granulocytes
  - A granulocytes
  - Abnormal values and associated conditions
  - Hemogram Versus Complete Blood Count
  - Blood and Serum Collection Tubes
- Chemistry
  - Biochemical Profiles
  - Electrolyte
    - Sodium
    - Potassium
    - Calcium
    - Magnesium
    - Chloride
    - Phosphate
  - ABGs
- Clotting Tests
  - Prothrombin Time(PT)
  - Partial Thromboplastin Time (PTT)
  - Activated Partial Thromboplastin Time (APTT)
  - Fibrinogen
- Urinalysis
- Tissue and Cell Diagnosis

- Specimen types and consideration for handling
- Tissue preservation
- Genetic studies
- Nonfixed specimens
- Microbiology
- Culture and sensitivity
- Cytology

❖ Biopsy
- Smear
- Aspiration biopsy
- Percutaneous
- Punch
- Incisional biopsy
- Frozen section
- Permanent section

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

PRE-OPERATIVE RADIOLOGIC INVESTIGATIONS

Module No: 05

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

Contents

- ECG
- Ultrasound Studies
  - Dopler studies
- Radiographic Studies
- Radiation Safety
  - Time
  - Distance
  - Shielding
  - Radiation Monitoring
- Radiology and the Sterile Field
- Conventional Standards X-Ray
  - AP and PA film
- Contrast enhanced studies and their uses
  - Barium Sulphate
  - Other Water soluble agents
  - Ionic and ionic contrast agents
  - Cholengiogram
  - Pyelogram
  - Angiography
- Fluoroscopy
- CT Scan
- MRI

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

PRE-OPERATIVE CARE

Module No: 06

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

- Tasks involved in preparing a patient for Theatre
- The common problems affecting a Patient's fitness for Operation
- Optimization of patient's medical state prior to anesthesia/Surgery
- Informed consent
- Organization of the Operation list

Contents

- **Preoperative Preparation**
  - Patient Assessment
    - Introduction
    - History
    - Layout of Standard History
    - Examination
    - Investigations
    - Management
  - Specific Preoperative Problems
    - Cardiovascular Diseases
    - Respiratory Diseases
    - Gastrointestinal Diseases
    - Genitourinary Disease
    - Metabolic disorders
    - Coagulation Disorders
    - Neurological and Psychiatric Disorders
    - Locomotor Disorders
    - Remote Site Infection
  - Documentation
  - Obtaining the Consent
- Multi professional Team Involvement

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

OPERATING ROOM TECHNIQUES

Module No: 07

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

- Identify the correct setup of a surgical case
- Identify methods to open surgical supplies correctly
- Describe the process to perform sponge, needle, instrument, and sharp counts correctly
- Demonstrate neutral zone technique
- Demonstrate passing instruments so they are properly oriented for use
- Identify methods to care for specimen correctly
- Discuss the selection and preparation of would drains
- Demonstrate preparation of the surgical wound dressings
- Describe the safe technique for handling the tissue

Contents

- Case planning and setup
  - Type of Surgery
    - Diagnostic
    - Reconstruction
    - Repair
    - Removal
    - Replacement or implantation
  - General Case planning
- Opening a Case
  - Preparing non-sterile items
  - Opening sterile supplies
- Setup of sterile work areas and supplies
  - Organization of the equipment
  - Priority setup
  - Secondary preparation
    - Suture
    - Instruments
    - Delicate instruments
    - Solutions and Drugs
    - Microscope draping
    - Completion of the setup
    - Preparation of the surgical field
    - Incision
  - Surgical Count
    - Why is the count performed
    - Who is responsible for retrieving the items

- When and how and what is counted
- Documentation of the count

○ Lost and retrained items
- How items are lost
- How to search for a lost item

○ Maintaining the surgical field
- Keeping an orderly surgical field
- Maintaining adequate light
- Handling and maintaining of sponges
- Passing and handling of the Surgical instruments

○ Care and handling of the body tissues during the surgery
- Rough and excessive handling of the tissues
- Tissue Dehydration
- Dissection
  - Sharp
  - Blunt
- Retraction
- Prevention of intraoperative tissue trauma
- Hemostasis

○ Wound Drains

○ Wound Dressing

❖ Handling and caring of the specimen

○ Responsibility for Specimen

○ Care of Specimens

○ Types of specimens
- Tissue
- Fluid
- Stone
- Foreign Bodies
- Amputations
- Specimens for Culture

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

INTRA AND POST-OPERATIVE CARE

Module No: 08

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

Contents

- **Care in the Operating Room**
  - Preoperative Preparation immediately Before Surgery
    - Surgeon's Preparation for the Operation
    - Preoperative Planning and checklist
    - Theatre Team's preparation for the operation
    - Pre and Perioperative Communication
    - The Theatre List
    - Induction of Anesthesia
    - Tourniquet
  - The Operation
    - Transfer and patient setup
    - Asepsis
  - Operating Room Theatre
    - Temperature and humidity
    - Illumination
    - Ventilatory System
    - Movement
    - Airborne Contamination
  - The Patient on the Operating Table
    - Hypothermia
    - Accidental Injury to the Patient
  - Skin Preparation and Draping
  - General precautions for establishing and maintaining aseptic Technique
  - Post Operative Care of the Patient
- **Perioperative Management of High Risk Surgical patient**
  - Introduction
  - Frequency of Complications in population
  - Patient, Surgery, and Anesthesia related factors
  - Identification of High Risk Patient
  - General Aspects of Perioperative care
    - Preoperative Assessment
    - Preoperative Medical therapy
  - Critical Care
  - Assessment of the Surgical patient in critical care

        - Basic Clinical assessment
        - Invasive Arterial Pressure monitoring
        - CVP
        - ABGs Analysis
        - Cardiac Output monitoring
    - General Aspects of Critical Care
    - Postoperative Respiratory management
        - Mechanical Ventilation
        - Non-Invasive Ventilation
    - Postoperative Cardiovascular management
        - General approach to treatment of circulatory shock
        - Specific measures for the treatment of circulatory shock
    - Care of Surgical tubes and drains
    - Specific management strategies for the High-Risk Surgical patient

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

TRAUMA AND ITS MANAGEMENT

Module No: 09

Year No: 03

Module Incharge:

Duration Weeks: 04 Contact Hrs: 160 Credit: 6.0

Learning objectives

- The importance of time in trauma management
- How to respond to a trauma problem
- How to assess a trauma problem
- The evaluation of planning
- The sequence of priorities in the early assessment of the injured patient
- Application of principles of primary and secondary survey in the assessment and management of trauma

Contents

- Introduction to Trauma and initial assessment
- Basic life support
- Advance trauma life support
- Shock and Blood transfusion
- Abdominal trauma and its management
- Thoracic trauma
- Pain management
- Burns and their management
- Genitourinary Trauma
- Blast injuries
- Wound management in emergency settings
- Pediatric trauma
- Spinal injuries

Sr. No.	List of Learning Resources for the Module
1.	

Module Name:

CLINICAL SURGERY I

Module No: 10

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

At the end of this module, the students will be able to

- Thoroughly understand the anatomical, physiological, pathological processes involved in specific surgical diseases, including the relationships between the condition, and the overall health status of the patient.
- Predict the appropriate surgical setups required in the Operating Room
- Able to check diagnosis on charts and before the surgical procedure it is used in the checklist to ensure the identity of the patient and required investigations

Contents

- Fluid and Electrolyte Balance
- The thyroid and parathyroid glands
- Adrenal gland and other endocrine disorders
- The Breast
- Arterial disorders
- Venous disorders
- Hernias, umbilicus and abdominal wall
- The peritoneum, omentum, mesentery and retroperitoneal space
- Stomach and duodenum
- The liver
- The Spleen
- The gall bladder and bile ducts
- The pancreas

Sr. No.	List of Learning Resources for the Module
1.	

2.	

Module Name:

CLINICAL SURGERY II

Module No: 11

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

At the end of this module, the students will be able to

- Thoroughly understand the anatomical, physiological, pathological processes involved in specific surgical diseases, including the relationships between the condition, and the overall health status of the patient.
- Predict the appropriate surgical setups required in the Operating Room
- Able to check diagnosis on charts and before the surgical procedure it is used in the checklist to ensure the identity of the patient and required investigations

Contents

- The small and large intestine
- Intestinal obstruction
- The vermiform appendix
- The rectum
- The anus and anal canal
- Urinary symptoms and investigations
- Adrenal gland and other endocrine disorders
- The kidney and ureter
- The urinary bladder
- The prostate and seminal vesicles
- Urethra and penis
- Testis and scrotum

Sr. No.	List of Learning Resources for the Module
1.	

2.	

Module Name:

SURGICAL PROCEDURES I

Module No: 12

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

In this module the students will be taught

- Review of the relevant anatomy
- Common surgical incisions used in general surgery
- Methods for Preparing the patient for the abdominal procedures
- Steps of the surgical procedure
- Equipment's, instruments and supplies needed for the procedures
- Maintaining of aseptic technique during the surgical procedure

Contents

Contents

- Surface anatomy of the abdomen
- Incisions
  - Midline
  - Upper Paramedian
  - Subcostal
  - McBurney
  - Inguinal
- Abdomino Perineal Resection
- Appendectomy: Open or Laproscopic
- Breast Biopsy
- Chest intubation
- Cholecystectomy: Open or Laproscopic
- Colon Resection
- Coleostomy
- Common Bile Duct Exploration
- Diaphragmatic Hernia
- Draining Pancreatic Cyst
- Excision and Biopsy
- Esophagectomy

- ❖ Esophagogastrectomy
- ❖ Excision of Pilonidal Cyst
- ❖ Fundoplication
- ❖ Femoral Hernia
- ❖ Fistulotomy/Fistulectomy

Learning Outcomes

At the completion of this module, the students will be able to

- Identify equipment's, instruments and supplies needed for the surgical procedure
- Assist safely as an effective member of surgical team
- Provide intraoperative care to the patient
- Drape the patients according the desired surgical procedure
- May solve the encountered problems regarding the equipment by relating previous knowledge of surgical equipment's.

Important Note: All these procedures are taught according the following format

- ➢ Definition of the procedure
- ➢ Goal of the procedure
- ➢ Pathology
- ➢ Discussion (Instruments, equipments and supplies needed)
- ➢ Surgical Procedure Steps including skin preparation and draping

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

Module Name:

SURGICAL PROCEDURES II

Module No: 13

Year No: 03

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning objectives:

In this module the students will be taught

- Review of the relevant anatomy
- Common surgical incisions used in general surgery
- Methods for Preparing the patient for the abdominal procedures
- Steps of the surgical procedure
- Equipment's, instruments and supplies needed for the procedures
- Maintaining of aseptic technique during the surgical procedure

Contents

- Gastrectomy
- Gastroduodenostomy
- Gastrojejunostomy
- Gastrostomy
- Hemorrhoidectomy
- Iliostomy
- Incision and Drainage
- Incision Biopsy
- Incisional Hernia
- Inguinal Hernia: Herniotomy and Herniorapy
- Jejinostomy
- Laprotomy
- Liver Biopsy
- Liver Resection
- Mastectomy
    - Parathyroidectomy
- Right Hemi colectomy
- Small Bowel Resection

- ❖ Splenectomy
- ❖ Thyroidectomy
- ❖ Tracheostomy
- ❖ Umbilical Hernia
- ❖ Vascular Access Procedures
- ❖ Vein Ligation & Stripping
- ❖ Whipple's Operation

Learning Outcomes

At the completion of this module, the students will be able to

- Identify equipment's, instruments and supplies needed for the surgical procedure
- Assist safely as an effective member of surgical team
- Provide intraoperative care to the patient
- Drape the patients according the desired surgical procedure
- May solve the encountered problems regarding the equipment by relating previous knowledge of surgical equipment's.

Important Note: All these procedures are taught according the following format

- ➢ Definition of the procedure
- ➢ Goal of the procedure
- ➢ Pathology
- ➢ Discussion (Instruments, equipment and supplies needed)
- ➢ Surgical Procedure Steps including skin preparation and draping

Sr. No.	**List of Learning Resources for the Module**
1.	
2.	

YEAR 4

S.No	MODULE TITLE	CREDIT HOURS	CONTACT HOURS	WEEKS
1.	Introduction to Anesthesia and techniques	4.5	120	3
2.	Anesthesia Equipment's	4.5	120	3
3.	Medical Surgical Skills	4.5	120	3
4.	Central Sterile Supply Department	4.5	120	3
5.	Operating Room Environment and Design	6	160	4
6.	Ophthalmic Surgery	9	240	6
7.	Orthopedic Surgery	9	240	6
8.	Genito urinary Surgery	9	240	6
9.	Pediatrics Surgery	9	240	6

Module Name:

INTRODUCTION TO ANESTHESIA AND TECHNIQUES

Module No: 01

Year No: 04

Module Incharge:

Duration Weeks: 03 Contact Hrs: 120 Credit: 4.5

Learning Objectives:

After studying this module, the reader will be able to

- Describe three methods of general anesthesia
- List the categories of ASA classification system
- Describe the physiologic effects of general anesthesia
- Discuss the purpose for cricoid pressure
- Differentiate between general and regional anesthesia
- Describe the surgical technologist possible tasks during a cardiopulmonary arrest in surgery
- List key points in providing safety for the anesthetized patient.

Contents

- Anaesthesia techniques
- Historical background
- Types of Anaesthesia
- Choice of Anaesthesia
- General Anaesthesia
- Indication of general anaesthesia
- Endotracheal intubation
- Maintenance
- Monitoring
- Emergency
- Balanced Anaesthesia
- Core of Anaesthetized patient
- Local & regional anaesthesia
- Spinal and epidural anaesthesia
- Intravenous anaesthesia agents
- Inhalational anaesthetic agents
- Anaesthetic Adjuvant drugs
- Complication of general anaesthesia
- Complication of local/regional anaesthesia
- Blood transfusion
- Difficult Intubation

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

ANESTHESIA EQUIPMENT'S

Module No: **02**

Year No: **04**

Module Incharge:

Duration Weeks: **03** **Contact Hrs:** **120** **Credit:** **4.5**

Learning Objectives:

Contents

- Gas supply and distribution systems
  - Medical gas cylinders and containers
  - Medical gas pipeline system
  - Suction equipment
  - Oxygen concentrate
- Anesthesia machine and breathing system
  - The anesthesia machine
  - Vaporizers
  - The breathing system: General principles, common components and classifications
  - Mapleson Breathing system
  - The Circle system
  - Manual resuscitators
  - Humidification Equipment
  - Anesthesia ventilators
  - Controlling Trace Gas levels
  - Hazards of Anesthesia Machine and Breathing System
- Air way equipment's
  - Face masks and airways
  - Supraglottic Airway devices
  - Laryngoscopes
  - Tracheal tubes and associated equipment
  - Lung isolation devices
  - Devices for managing the difficult airway
- Monitoring devices
  - Gas monitoring
  - Airway Volumes, Flows, and Pressures
  - Pulse Oximetry
  - Neuromuscular Transmission Monitoring
  - Alarm Devices
  - Noninvasive Blood Pressure Monitor
  - Temperature Monitoring
- Equipment Care
  - Equipment Checkout and Maintenance
  - Cleaning and Sterilization

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

MEDICAL SURGICAL SKILLS

Module No: **03**

Year No: **04**

Module Incharge:

Duration Weeks: **03** **Contact Hrs:** **120** **Credit:** **4.5**

Learning Objectives

Contents

- Temperature
- Pulse
- Respiration
- Blood pressure
- Pulse Oximetry
- Capillary blood draw
- vein puncture
- Blood draw from a Central Venous Catheter
- Nasopharyngeal Swab
- Throat Culture
- Collection of Stool Specimen
- Collection of Urine Specimen
- Assisting with Collection of CSF
- Insertion of a peripheral IV line
- Insertion of Nasogastric tube
- Nasogastric lavage
- Administration of bolus feeding
- Changing a fecal Ostomy Appliance
- Emptying an Ostomy Pouch
- Administration of Enema
- Urinary Catheterization
- Oxygen administration
- Tracheostomy Monitoring
- Monitoring of Endotracheal tube

Contents

-

Sr. No.	List of Learning Resources for the Module
1.	
2.	

CENTRAL STERILE SUPPLY DEPARTMENT

Module No: **04**

Year No: **04**

Module Incharge:

Duration Weeks: **04** **Contact Hrs:** **120** **Credit:** **4.5**

Learning Objectives

- Student will gain an understanding of decontaminating soiled instrument and supplies
- Students will study the preparation of instruments for terminal sterilization
- Teaching of inspection and testing of instrument and supplies
- Students will be taught different type of materials used for wrapping the instrument and supplies

Contents

- Cleaning and dusting
  - Methods of cleaning
  - Composition of dust
- Decontamination of soiled instruments and supplies
  - manual cleaning
  - remove gross debris
  - agents used for cleansing
  - rinsing
  - loading into trays/carriers
  - washer-sterilizer
  - arrangement of instruments on trays
- Ultrasonic cleaning
  - Indications
  - cavitation
  - Implosion
  - Arrangement of instruments
- Instrument preparation for sterilization
  - Lubrication
  - Water soluble
  - Steam penetrable
  - Antimicrobials
- inspection and testing
  - Check hinged instruments for stiffness
  - Ratchet teeth
  - Test forceps for proper alignment
  - Test scissors and sharps
  - Demagnetize
  - Microsurgical instruments
- instrument set assembly
  - Weight distribution
  - Hinges open
  - Lumens horizontal
  - Preventing damage
- Select and utilize proper wrapping materials, peel pouches, and instrument cases/carriers
  - muslin/cotton/polypropylene
  - paper
  - paper/plastic pouches
  - sterilization cases
- sealing methods
  - process tape
  - heat seal
  - adhesive seal
  - sterilization case locking devices
- Select and utilize appropriate sterilization process monitors
  - internal chemical monitors
  - process-sensitive tape
- Label instruments accurately
  - contents
  - initial of processor
  - department
  - date and lot number of sterilization
- Select appropriate methods/agents for sterilization

- thermal
  - steam under pressure
  - gravity displacement
  - pre-vacuum
  - "flash"
- dry heat
- vapor
  - EO/EtO-ethylene oxide
  - Ionizing radiation
  - cold/chemical
- activated glutaraldehyde
- Peracetic/acetic acid
- hydrogen peroxide plasma

❖ Work collaboratively with health care team members

❖ Management of CSSD

Desired Outcome:

- The students will able to identify and demonstrate the packaging of different types of instruments for sterilization
- The student will demonstrate skills necessary in care and handling, processing, and sterilization of instrumentation in the Central Supply Department.
- They will be able to work effectively in Central Sterile Supply/ Processing Department

Sr. No.	List of Learning Resources for the Module
3.	
4.	

Module Name:

OPERATING ROOM ENVIRONMENT AND DESIGN

Module No: **05**

Year No: **04**

Module Incharge:

Duration Weeks: **04** **Contact Hrs:** **160** **Credit:** **6.0**

Learning Objectives:

Contents

❖ Physical Facilities

- Historical background
- Physical Layout of the surgical suit
- Transition zones
- Peripheral Support areas

- Operating room
- Special procedure rooms

❖ Ambulatory Surgery centers
- Ambulatory Surgical Settings
- Alternative Sites where surgery is performed

❖ Care of the perioperative Environment
- Standards of Cleanliness in Surgical Environment
- Classification of Operating room on the basis of no. of microbes present in environment
- Care of Operating room Environment

❖ Potential Sources of Injury to the care giver and the patient
- Environmental Hazards and safeguards
- Chemical hazards and safeguards
- Biologic Hazards and safeguards

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

OPHTHALMIC SURGERY

Module No: 06

Year No: 04

Module Incharge:

Duration Weeks: 06 Contact Hrs: 240 Credit: 09

Learning Objectives:

Learning Objectives

In this module the students will be taught

- Review of the relevant anatomy
- Methods for Preparing the patient for the abdominal procedures
- Assisting in various Eye surgical procedures
- Equipment's, instruments and supplies needed for the procedures and their troubleshooting
- Maintaining of aseptic technique during the surgical procedure
- Processing and sterilization of eye instruments

Contents

- Review of Anatomy of Eye
- Care of the Ophthalmic Patient
- Positioning the Ophthalmic patient
- Prepping and Draping the Patient
- Instruments identification their use, care and sterilization
- Equipment's and Supplies
- Commonly performed eye procedures (definitions, Goal of the procedure, Discussion including instrument, equipment and supplies needed and procedure steps)

Learning Outcomes

At the completion of this module, the students will be able to

- Practice safe procedures assisting and techniques in eye surgery as circulator and Scrub Surgical technologist
- Sort out the Supplies needed for the required procedures
- Explain how to prepare microscope for use and care for it properly
- Name and recognize commonly used eye instruments
- Sterilize and processing of equipment and supplies
- Differentiate the types of ophthalmic drugs and their uses.
- Operation Theater Management

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

ORTHOPAEDIC SURGERY

Module No: 07

Year No: 04

Module Incharge:

Duration Weeks: 06 Contact Hrs: 240 Credit: 9

Learning Objectives:

In this module the students will be taught

- Review of the relevant anatomy
- Methods for Preparing the patient for the Orthopadic Procedures
- Assisting in various type of orthopedic procedures
- Equipment's, instruments and supplies needed for the procedures and their troubleshooting
- Maintaining of aseptic technique during the surgical procedure
- Processing and sterilization of eye instruments
- Work flow in the Orthopedic Operation Theatre

Contents

- Review of Anatomy of muscle the bones and their function
- Care of the Orthopedic Patient
- Positioning the patient
- Prepping and Draping the Patient
- Instruments identification their use, care and sterilization
- Equipment's and Supplies
- Types of diagnostic tests and laboratory tests used preoperatively in the Orthopedic patient
- Commonly performed procedures (definitions, Goal of the procedure, Discussion including instrument, equipment and supplies needed and procedure steps)
- Management of the theatre work

Learning Outcomes

At the completion of this module, the students will be able to

- Practice safe procedures assisting and techniques in Orthopedic surgery as circulator and Scrub Surgical technologist

- Sort out the Supplies needed for the required procedures
- Explain how to prepare arthroscope for use and care for it properly
- Name and recognize commonly used eye instruments
- Sterilize and processing of equipment and supplies
- Management of Orthopaedic Operation Theatre

Module Name:

GENITOURINARY SURGERY

Module No: 08

Year No: 04

Module Incharge:

Duration Weeks: 06 Contact Hrs: 240 Credit: 9

Learning Objectives:

In this module the students will be taught

- Review of the relevant anatomy
- Methods for Preparing the patient for the Urologic Procedures
- Assisting in various type of Urologic procedures
- Equipment's, instruments and supplies needed for the procedures and their troubleshooting
- Maintaining of aseptic technique during the surgical procedure
- Processing and sterilization of urology instruments
- Work flow in the Urology Operation Theatre

Contents

- Review of Anatomy of Genitourinary system
- Care of the Urology Patient
- Positioning the patient
- Prepping and Draping the Patient
- Instruments identification their use, care and sterilization
- Equipment's and Supplies
- Types of diagnostic tests and laboratory tests used preoperatively in the urologic patient
- Commonly performed procedures (definitions, Goal of the procedure, Discussion including instrument, equipment and supplies needed and procedure steps)
- Management of the theatre work

Learning Outcomes

At the completion of this module the students will be able to

- Practice safe procedures assisting and techniques in Urologic Surgery as circulator and Scrub Surgical technologist
- Sort out the Supplies needed for the required procedures
- Name and recognize commonly used eye instruments
- Sterilize and processing of equipment and supplies
- Management of the Urology Theatre

Sr. No.	List of Learning Resources for the Module
1.	
2.	

Module Name:

PAEDIATRIC SURGERY

Module No: 09

Year No: 04

Module Incharge:

Duration Weeks: 06 Contact Hrs: 240 Credit: 09

Learning Objectives:

In this module the students will be taught

- Review of the relevant anatomy
- Methods for Preparing the patient for the Orthopadic Procedures
- Assisting in various type of orthopedic procedures
- Equipment's, instruments and supplies needed for the procedures and their troubleshooting
- Maintaining of aseptic technique during the surgical procedure
- Processing and sterilization of Pediatrics instruments
- Work flow in the Orthopedic Operation Theatre

Contents

- Introduction to the pediatric Surgery
- Physiological needs

- Positioning the patient
- Prepping and Draping the Patient
- Instruments identification their use, care and sterilization
- Special Equipment's and Supplies
- Commonly performed procedures (definitions, Goal of the procedure, Discussion including instrument, equipment and supplies needed and procedure steps)
- Management of the theatre work

Learning Outcomes

At the completion of this module, the students will be able to

- Practice safe procedures assisting and techniques in Urology surgery as circulator and Scrub Surgical technologist
- Sort out the Supplies needed for the required procedures
- Name and recognize commonly used pediatric instruments
- Sterilize and processing of equipment and supplies
- Management of the Operation Theatre work

Sr. No.	**List of Learning Resources for the Module**
3.	
4.	

13. Taxonomy of Learning Domains

(Blooms Taxonomy of Learning Objectives). A committee of colleges, led by Benjamin Bloom (1956), categorized learning objectives in three domains.

i) Cognitive Domain (Theoretical Learning)

ii) Psychomotor Domain (Skill Learning)

iii) Attitudes (Performance under Emotional Control)

The recommendations of Bloom Taxonomy have been received several times. Most common classification applied in medical education is as under;

The levels of learning in the curriculum and the corresponding testing levels of examinations are predetermined in the light of classification (Blooms Taxonomy) of learning objectives. In these Programs, the taxonomy will be used at planning management and evaluation points of education.

14. Credit Accumulation and Transfer System (CATS)

A credit accumulation and transfer system is a systematic way of describing an educational program by attacking credits to its components. ***Credit Hour*** or Credit Unit is basically the ***academic currency*** of the academic activities i.e. units, modules, semesters or programs. The Credit Accumulation and Transfer System (CATS) for B.Sc (Hons) programs have been based upon the "European Credit Transfer System (ECTS)".

CATS is based on the principle that 60 credits measure the workload of a full time student during one academic year. The student workload of a full-time study program in Europe amounts in most cases to around 1500-1800 hours per year, and in those cases one credit stands for around 25 to 30 working hours (for both taught and practical training).

As defined by European Credits Transfer system (ECTS), the CATS at KEMU is defined for B.Sc.(Hons) Allied Health Sciences as follows;

1. Contact Hours 1600 hrs/year
2. 27 Contact Hours = 1 Credit Point

3. Number of Credit Point Required in a Year = 60
   Number of Credit Point Required in a Semester = 30

The conversion of CATS of KEMU to regular credit hours in other universities in Pakistan: 60:30 i.e. 2:1

15. Research Work

15.1 General Regulations**:**

All students of BSc Allied Health Sciences, during year III and IV shall be assigned at least one Research Assignment (Literature Review/Clinical Cases Collection and Reporting. (as given

under)

15.2 The members of the Program Faculty Committee of year III and IV will act as supervisors/mentors of the students.

15. 3 The Topic of Research Assignment will be approved by the supervisor / mentor.

15.4. The Research Proposal/Synopsis and final Research Report will be recommended by the Supervisor and approved by the Program Director.

15.5. Guide lines are given at para 16 & 17.

16. Objectives of Literature Review Assignments

Student will be assigned a clinical problem, related to their program most commonly encountered in the specialty; and will be expected to review the literature and write a "Review Article" comprising of;

- Topic
- Introduction
- Review of Literature
- Conclusion
- References

17. Objectives of Clinical Cases Collection and Reporting

Student will be assigned a clinical problem encountered in the field of the Program; and will be expected to collect data and write a "Report" comprising of;

- Topic
- Aims of Study;
- Case Report Form (Study Performa)
- Result & Analysis
- Conclusions

18. Instructional Strategies/Learning Strategies

Educational Strategies in Medical Education have attracted much attention and controversy in recent years. An increased orientation to the consumer of the education has been reflected in a move of focus from "what students are taught, to what trainees learn", from "acquisition of knowledge, to the application of knowledge", and from "topic oriented teaching to objective oriented learning".

In an attempt to achieve the learning objectives in medical education, eight (8) important educational strategies have been developed during the past 50 years. These are;

a. Student-centered-learning(SCL)

b. Problem –based-learning(PBL)

c. Integrated teaching(IT)

d. Community-based-education(CBE)

e. Task-based-learning(TBL)

f. Team Based Learning (TBL), and

g. Evidence-Based-Learning (EBL)

h. Best Evidence Medical Education.

19. Log Book

i). The Log Book containing record of participation of student in following activities;

- Instructions
- Training (skill learning)
- Scholarly activities.
- Duties

ii). The assessments of the students that will be carried out by the teachers at end of each module & semester.

iii) The brief summary of each assignment carried out by the student and assessed by the teacher.

iv). The student's assessment of the quality of teaching/learning resources carried out at the end of each module, along with the reply of the teachers.

v). The list and number of technical procedures performed attended by the students.

20. Roles and responsibilities of Teachers

i) Ensure organization of excellent learning experience for the students.

ii) Continuously endeavors to improve their education, skills, and behavior to be an excellent teacher and an ideal role model for the student.

iii) It is teacher's responsibility to counsel, censure, or after due process to dismiss a candidate who fails to demonstrate appropriate competence, reliability or ethics.

Teachers must closely monitor the conduction of the program and students performance and try to bring improvements in both

21. Criteria of Supervisors & Mentors

The Program Faculty Committee should appoint Mentors/Supervisors to each student. The main role of Mentors/Supervisors to perform Carrier Counseling, give guideline and act as "Role Model". The Mentors/Supervisor must hold regular meetings with their students.

22. Assessments, Progression & Examinations

Examinations

1. Module Assessments and Semester GPA Calculation
2. Mid Comprehensive Examination
3 Final Comprehensive Examination

Module Assessments and and Semester GPA Calculation.

1.1. Candidate must achieve 80% attendance in all teaching activities of each module to be allowed to sit in module assessments.

1.2. Candidate(s) who fail to achieve 80% attendance in each module may be allowed to attend makeup education activities by the Module In charge Teacher in the same module.

1.3. Candidate(s) must achieve at least 50% marks to pass the module test (evaluation).

1.4. Candidate(s) who fail to achieve 50% marks may be allowed to appear in re-sit module evaluation by the Module In charge Teacher.

1.5. Module Evaluation will be carried out at the end of each module by the Module Faculty and Module In charge Teacher will act as Head Examiner.

1.6. The Report of the Attendance and Result of Evaluation of each Module will be prepared by Module In charge Teacher and and send to the Dean AHS modules in year-1 and to respective Program Director(s) for modules in year 2, 3 and 4, who shall forward a copy to the Controller of Examination for notification.

1.7. Candidates who fail to pass all modules in a Semester before starting the next Semester shall be dropped from the program..

Mid Comprehensive Examination (MCE)

2.1. Candidate(s) who have passed all module evaluation(s) of semester-I, II, III and IV will be allowed to sit in Mid Comprehensive Examination.

2.2. One annual and one supplementary mid-comprehensive examination will be held every year.

2.3. There will be Three (3) Papers each comprising of 100 MCQ of one best answer typ. Time allowed for each paper will be 100 minutes.

2.4. Paper-1 = Islamic Studies and Pakistan Studies

Paper-2 = Basic Medical Sciences (Semester-I) and
Basic Engineering/ Sciences (Semester-II)

Paper-3 = Applied Medical Sciences of (Semester-III) and
Applied Engineering Sciences (Semester-IV)

Paper-1, and will be common to all students of B.Sc .AHS Programs.

Paper-2 will be common to all Programs of BSc AHS.

Paper -3 will be Program Specific and so separate for each Program.

2.5.The Table of Specifications will be issued by the Dean AHS for Paper 1 and Paper 2, and by the respective Program Directors for the Paper 3. Paper 2 and 3 will comprise of MCQs of the Modules taught according to the duration of Modules.

Total Questions will be 100 (2.5 MCQ for One Week

.

1. **Panel of Examiners**;

Paper 1.

Two Examiners (one Internal and One External) each for "Islamic Studies and Ethics" and Pakistan Studies.

Paper 2.

Part-1,The Teacher Incharg of All Modules of Basic Medical Sciences (Semester-I) will make three (3) Papers of 50 MCQ each and submit to the Controller of Examination who will select one of them blindly to include in the paper.

Part-2,The Teacher Incharg of All Modules of Basic Engineering/ Sciences

(Semester-II) will make three (3) Papers of 50 MCQ each and submit to the Controller of Examination who will select one of them blindly to include in the Paper.

The Dean AHS will coordinate Faculty of Semester 1 and Semester 2 to make the

Question Papers.

Paper-3; Panel of Three (3) Examiners one internal and two external (one each for Semester 3 and Semester 4) will set the Paper 3, having 50 MCQ each for Modules in Semester 3 and Semester 4.

2. candidate(s) who secure 33% or above marks in paper one (1) and

50% or above marks in paper (2), (3)will be declared pass.

3. . candidate(s) who fails in one or more papers will be allowed to re- appear in failing paper(s) and will be granted progression to year-III only when they will pass all papers of mid-comprehensive

4. Research.

Students in 3rd year of all B.Sc (Hons) Programs are attached to a supervisor/mentor (one of the members of the Program Faculty Committee) by the Program Director. The respective supervisor/mentor will supervise the student to write synopsis and Dissertation of the Research Assignment to be completed before final comprehensive examination.

Evaluation and Approval will be granted by another member of the Program Faculty Committee as appointed by the Program Director.

Final Comprehensive Examination (FCE)

3.1. Requirements to appear in FCE.

i. Result Card of Passing Mid-Comprehensive Examination by Controller of Examination.

ii. Certificate of Passing all Module Evaluation of year 3 & 4 by Program Director and the Controller of Examination.

iii. Certificate of Satisfaction by Program Director regarding Log Book and completion of Research Work.

3.2. Format of Final Comprehensive Examination (FCE)

Papers two (2) Marks=200 100 marks each paper

Paper-1 : Curriculum Content of year-III 100 Marks

Paper-2 : Curriculum Content of Year-IV 100 Marks

Each Paper will be composed of one hundred (100) one best types MCQs. Time allowed for each paper will be one hundred (100) minutes.

Oral and Practical	=	Total Marks 200
Viva and Oral Discussion	=	100 Marks
Practical Skills	=	100 Marks

3.3. Panel of Examiners

Panel of two (2) examiners for each paper one internal and one external, will make and check papers and conduct examination for Viva and Practical Examination.

3.4. Candidate(s) who achieve 50% or more marks separately in (i) theory paper and in (ii) viva & practical examination will be declared pass.

3.5. Candidate(s) who fail in (i) theory or (ii) oral/practical or (iii) both will be allowed to appear in the failing parts, in subsequent examinations.

23. Scoring and Grading System

The GP System will be used to issue transcript of the students.

Sr. No	Letter Grade	Grade Point Value	Numerical Grade (%)
1.	**A+**	**4.00**	85 % and above
2.	**A**	**3.70**	80 % - 84 %
3.	**B+**	**3.40**	75 % -79 %
4.	**B**	**3.00**	70 % - 74 %
5.	**B-**	**2.50**	65 % - 69 %
6.	**C+**	**2.00**	60 % - 64 %
7.	**C**	**1.50**	55 % - 59 %
8.	**D**	**1.00**	50 % - 54 %
9.	**F**	**0.00**	Below 50 %

24. Administration of Program(s)

27.1. First year of education (Semester of I & II) will be common to students of all programs and Dean AHS will administer semester I & II and send results of modules to the Controller of Examination.

27.2. After successful completion of year 1 (semester I & II) the specific programs will be allotted to the students by Board of Studies of AHS based on the choice of student and merit of admission.

27.3. Whole curriculum is managed module wise. The full time, part time and visiting faculty will teach the program and carry out assessment of the respective modules and semesters.

27.4. The Board of Studies of Allied Health Sciences will also act as Program Coordination Committee. The BOS AHS will notify "List of Program Faculty Committees" for Semester 1, Semester 2, Year 2, 3 and 4 under Chairman Ship of Program Director for each "BSc(Hons) Program for a period of four (4) years and is responsible to develop, manage and monitor the curriculum of their respective program and have following composition.

- Program Director — Chairman
- Upto 05 full time faculty members — Members
- Upto 03 part time visiting faculty members — Members
- Student of the program (C.R. to be on yearly basis) — Member

Faculty Committee will be responsible to administer the curriculum and maintain discipline in Program.

27.5 Board of Studies (BOS)of Allied Health Sciences (All B.Sc. Programs Coordination Committee include all Program Directors shall develop, review and manage the;

a. Framework (Rules and Regulations of All AHS Programs).
b. Admissions
c. Examinations of AHS Programs
d. Administrative and Disciplinary Affairs.
e. Responsibilities of the Institution.
f. Responsibilities of the Teachers.

g. The requirements/Learning resources of the program.

h. The Learning Strategies to be used for instructions.

i. Quality Assurance Procedures.

j. Fee structure

k. Remunerations to teachers

l. Any other policy issue

25. Institutional Support and Learning Facilities

- The KEMU should ensure "State of Art' Technology Equipment and good learning environment for learning of students of these programs.
- KEMU must support the financial needs of outstanding students with poor socio-economic background.

26. Diploma Supplement

Diploma Supplement as described by EU Higher Education will be issued to each student.

As adapted from the European Commission of Higher Education, the "Diploma Supplement" is a document attached to a higher education program providing a standardized description of nature, level, context, content and status of the studies that were pursued and successfully completed by the graduates.

The Diploma Supplement is aimed at providing transparency and facilitating academic and professional recognition of qualifications (certificates, diplomas, degrees). A Diploma Supplement will be delivered to all graduates of all programs at King Edward Medical University Lahore in academic with following structure and recommendation structure and recommendation of Diploma Supplement.

1. **Information on the Institution**

   a. Name and address

   b. Academic calendar

   c. Academic authorities

   d. General description of the institution (including type and status)

   e. List of degree programmes offered

   f. Admission/registration procedures

   g. Main university regulation procedures

   h. CATS institutional co-ordinator

i. Objective of the course (preferably expressed in terms of learning outcomes and competences)
j. Prerequisites for entry into the Program
k. Program Curriculum contents
l. Recommended reading
m. Teaching methods
n. Assessment methods
o. Language of instruction

2. General Information on degree programmes

a. Qualification awarded
b. Admission requirements
c. Educational and professional goals
d. Access to further studies
e. Course structure diagram with credits (60 per year)
f. Final examination
g. Examination and assessment regulations

3. Description of individual Modules (course) units

a. Module/Course title
b. Module/Course code
c. Year of study
d. Two Semester/Three Semesters
e. Number of credits allocated to the Program, Each year, Each Semester, Each Module (based on the student workload required to achieve the objectives or learning outcomes)
f. Name of Program Director and In charge Teacher of each Module.

4. **General information for students**

i. Cost of living
ii. Accommodation
iii. Meals
iv. Medical facilities
v. Facilities for special needs students
vi. Financial support for students
vii. Student affairs office
viii. Study facilities
ix. International programmes
x. Language courses
xi. Internships
xii. Sports facilities
xiii. Extra-mural and leisure activities
Xvi Students associations

27. Quality Improvement of Programs

The statement(s) of learning objectives and procedures of program administration are called **academics standards**. The measurement of effectiveness of these academic standards is called **academic quality**.

The effectiveness of academic standards of BSc AHS programs is measured to determine the existing quality level and is taken as base line for its further improvement, through following procedures;

30.1. Internal Regular Monitoring

The programs are continuously monitored by the Program Director and reported in their Annual Monitoring Report. The report consists of following parts;

i. Certificate that program academic and administration procedures were carried out according to the laid down standards.

ii. Problems which were encountered while administrating the programs along with list of problems that were solved and unsolved.

iii. Annual Monitoring Report of the B.Sc. Allied Health Sciences will be provided to Dean AHS during month of January each year.

30.2. Self Evaluation (Peer Review)

A pear review committee of two specialists of the same field from outside KEMU are recommended by each Program Director to the Dean, AHS. The Dean will recommend the panels of peer review committees along with the time table of "Self Evaluation" of each program to the Vice Chancellor for approval. Self Evaluation of Program is conducted after every five years. The Program Director act as coordinator of the Self Evaluation. The Committee will review the Program on following

i. Review the curriculum content and teaching activities
ii. Review of Annual Monitoring Report of the Program Director.
iii. Quality on the Teaching/Learning activities and resources.
iv. Meet the Students and the Program Faculty and take their view on the effectiveness/smooth running of the program.

The Committee will visit the Learning Environment, meet students and faculty before making final report.

30.3. Accreditation (External Review)

This will be carried out by an approved accreditation agency.