Annexure - 'B'

REVISED SYLLABUS & CURRICULUM

w.e.f. 2022-2023 onwards

FOR

BS- ALLIED HEALTH SCIENCES (BS AHS)

(Four Year Degree Program)

A: BS AHS (Pathology Lab Sciences)
B: BS AHS (Surgery / OT Lab Sciences)
C: BS AHS (Radiology Lab Sciences)
D: BS AHS (Public Health Lab Sciences)

Department of Allied Health Sciences
Sargodha Medical College Campus
University of Sargodha
Sargodha

Forwarded for
o/a P/.
24/10/22.

Incharge
Department of Allied Health Sciences
Sargodha Medical College
University of Sargodha

Vetted

D: BS AHS (Public Health Lab Sciences)

Public Health Professionals are the professionals with high quality training in improving the health status of the population. Needless to say that the importance of Public Health is many times more in the 21st century compared to the previous years. The threats of new diseases, the ease of their transmission to populations around the world, bioterrorism, epidemic of obesity, maternal and child health, environmental and occupational impacts on health of the populations and the sociopolitical impact of policy making in countries are imminent. The responsibility of providing protection, both health-wise and financially, to the less advantaged has rapidly become an immense challenge at the national and international levels.

GOALS OF THE PROGRAMME:

The purpose of BS public health lab sciences program is to prepare public health professionals/technologists who will:

1. Improve the health status of the population
2. Fulfill the health care system needs and should be well versed with the basic and advance knowledge to improve the patient health.
3. Serve as responsible members in the professional community and are willing and able to assume leadership roles in the communities they serve.
4. Identify researchable problems, advocate and participate in research, and incorporate research findings into clinical practice.
5. Skillful, competitive and knowledgeable both practically and theoretically.
6. Cater the local and international needs for the promotion of community health.
7. Have the capacity, knowledge and capability to undertake career in enhancing and improving treatment in community and health care systems.
8. Correlate theory with practice and think creatively about, react to, adapt or shape new practice environments.

Vetted

OBJECTIVES OF THE PROGRAMME:

Graduates of the public health lab sciences programme will:

1. Solve health-related problems within the financial, socio-cultural, environmental and political framework of Pakistan and its surrounding region.
2. Design, conduct, analyze and interpret the results of relevant studies, projects and programmes.
3. Plan, manage, monitor and evaluate interventions in the field of public health.
4. Communicate public health messages to diverse audience effectively.
5. Advocate sound public health policies and practices.

BS PUBLIC HEALTH LAB SCIENCES SYLLABUS/CURRICULUM

1st YEAR

Sr. No.	Subject Title	Theory Marks	Practical / Clinical & G.Viva Marks	Total Marks
1	ANATOMY I	100	100	200
2	PHYSIOLOGY I	100	100	200
3	BIOCHEMISTRY & GENETICS I	100	100	200
4	FUNDAMENTAL OF PUBLIC HEALTH	100	100	200
5	ENGLISH	100	Not Applicable	100
6	INTRODUCTION TO COMPUTER	100	Not Applicable	100
	TOTAL	**600**	**400**	**1000**

2nd YEAR

Sr. No.	Subject Title	Theory Marks	Practical / Clinical & G.Viva Marks	Total Marks
1	ANATOMY II	100	100	200
2	PHYSIOLOGY II	100	100	200
3	BIOCHEMISTRY & GENETICS II	100	100	200
4	MEDICAL INSTRUMENTATION	100	100	200
5	ISLAMIC STUDIES	100	Not applicable	100
6	PAKISTAN STUDIES	100	Not applicable	100
	TOTAL	**600**	**400**	**1000**

Vetted

3rd YEAR

Sr. No.	Subject Title	Theory Marks	Practical / Clinical & G .Viva Marks	Total Marks
1	GENERAL PATHOLOGY & MICROBIOLOGY	100	100	200
2	COMMUNITY HEALTH	100	100	200
3	SOCIOLOGY AND BEHAVORIAL SCIENCES	100	100	200
	TOTAL	**300**	**300**	**600**

4th YEAR

Sr. No.	Subject Title	Theory Marks	Practical / Clinical & G. Viva Marks	Total Marks
1	SCIENTIFIC INQUIRY, BIOSTATISTICS, RESEARCH METHODOLOGY	100	Not applicable	100
2	EPIDEMIOLOGY	100	100	200
3	PUBLIC HEALTH MANAGEMENT	100	100	200
	TOTAL	**300**	**200**	**500**
	RESEARCH REPORT WRITING	Qualifying		

Note:

1. There shall be 01Question Paper in each subject having an equal contribution from all sections.
2. 10% marks are reserved for internal assessment based upon 3-5 Class Tests average, Class attendance, and Overall performance.

CREDIT ACCUMULATION AND TRANSFER SYSTEM (CAT)

A Credit accumulation and transfer system is a systematic way of describing an educational program based upon its components. Credit hour or credit unit is basically the academic currency of the academic activities.

Title	Recommended	Actual		
		Teaching	Clinical	Total
1. Contact hours 1500-1800 hrs/year 2. 25-30 Contact hours = 01 credit point 3. Number of credit points in a year = 55-60	1500-1800 hours/year	1500+1500+1200+1300= 5500	300+600=900	6400/4=1600 hours/year

Vetted

DIVISION OF STUDY HOURS

1st YEAR

Sr	Subject Title	Theory	Practical
1	ANATOMY I	200	100
2	PHYSIOLOGY I	200	100
3	BIOCHEMISTRY & GENETICS I	200	100
5	FUNDAMENTAL OF PUBLIC HEALTH	200	200
6	ENGLISH	100	-
7	INTRODUCTION TO COMPUTER	100	-
	TOTAL	**1500**	

2nd YEAR

Sr	Subject Title	Theory	Practical
1	ANATOMY II	200	100
2	PHYSIOLOGY II	200	100
3	BIOCHEMISTRY & GENETICS II	200	100
5	MEDICAL INSTRUMENTATION	200	200
6	ISLAMIC STUDIES	100	-
7	PAKISTAN STUDIES	100	-
	TOTAL	**1500**	

3rd YEAR

Sr	Subject Title	Theory	Practical
1	GENERAL PATHOLOGY & MICROBIOLOGY	200	200
2	COMMUNITY HEALTH	200	200
3	SOCIOLOGY AND BEHAVORIAL SCIENCES	200	200
	TOTAL	**1200**	

4th YEAR

Sr	Subject Title	Theory	Practical
1	SCIENTIFIC INQUIRY, BIOSTATISTICS, RESEARCH METHODOLOGY	200	-
2	EPIDEMIOLOGY	200	200
3	PUBLIC HEALTH MANAGEMENT	200	200
4	RESEARCH REPORT WRITING	300	
	TOTAL	**1300**	

BREAK DOWN OF HOURS OF CLINICAL PRACTICE

Year	Ward/Clinic	Hours	Period
3th Year	Clinical Rotation/ Field visits/Inspections	300	06 Months
4th Year	Clinical Rotation/ Field visits/Inspections	600	06 Months
	TOTAL	900	

GRAND TOTAL

	G. TOTAL (Theory + Practical + Report + Clinical)	6400	

Note:

*2/3rd of the clinical training shall be provided in the morning whereas 1/3rd shall be provided in the evening. There shall be 02 months of summer vacations in an academic session.

1. PAPER PATTERNS & MARKS DISTRIBUTION OF UNIVERSITY EXAMINATIONS

PAPER PATTERN

I **TOTAL MARKS = 100** (having Theory Section only)
II **TOTAL MARKS = 200** (having Theory + Practical & G. Viva)

I- TOTAL MARKS = 100 *(having Theory only)*

THEORY (100 marks)			
Question	**No of Questions**	**Marks for each Stem**	**Total marks**
Question 01:MCQs (20 stems with 04 possible options only 01 correct)	01	01	01x20 = 20
Question 02 to 09: SEQs (Requiring short answer of all)	08	05	08x05 = 40
Question 10 to 12: LEQs (Requiring detailed answer of any 02 Qs)	02	15	02x15 = 30
Total Marks			**90**
INTERNAL ASSESSMENT (10 MARKS)			
Internal assessment Theory part			10
Total Marks			10
Grand Total Marks			**100**

II- TOTAL MARKS = 200 *(having both Theory and Practical & General Viva)*

WRITTEN /THEORY (100 marks)			
Question	**No of Questions**	**Marks for each Stem**	**Total marks**
Question 01:MCQs (20 stems with 04 possible options only 01 correct)	01	01	01x20 = 20
Question 02 to 09:SEQs (Requiring short answer of all)	08	05	08x05 = 40
Question 10 to 12:LEQs (Requiring detailed answer of any 02	02	15	02x15 = 30

Incharge ... Sciences ... College ... Sargodha

Qs)			
Total Marks			**90**
PRACTICAL (40 marks)			
Marks for Internal			20
Marks for External			20
Total Marks			**40**
G.VIVA (50 marks)			
Marks for Internal			25
Marks for External			25
Total Marks			**50**
INTERNAL ASSESSMENT (20 MARKS)			
Internal assessment Theory part			10
Internal assessment Practical part			10
Total Marks			**20**
Grand Total Marks			**200**

Note:
Passing marks in each paper will be at least 50% in theory and 50% in practical/viva voice (in the case of practical subjects).

DETAILED COURSE OUTLINE PHLS

1st Year

1.	Anatomy I	200 Marks
2.	Physiology I	200 Marks
3.	Biochemistry & Genetics I	200 Marks
4.	Fundamentals of Public Health	200 Marks
5.	English	100 Marks
6.	Introduction to Computer	100 Marks
	Total Marks	**1000 Marks**

ANATOMY I

COURSE DESCRIPTION

The main aim of this course is to train and teach the students of first year BS degree program in such a way that they can practically apply the concepts of this subject which forms the firm foundation for the art of healing (medicine). The curriculum equips the students with the clear and comprehensive study of human body structural organization. The knowledge sharing is done with the students as it is the science of macro/micro structure and forms of the human body. The topics within the domain of anatomy include general anatomy, histology or microscopic anatomy, embryology or developmental anatomy, regional or gross anatomy which highlights the importance of the study of structural anatomy. Our teaching methodology involves group discussions, lectures and practical. At the end of the course study, the student will be able to understand the basic knowledge of upper limb, lower limb and thorax of the human body.

LEARNING OBJECTIVES

- Define basic technical terminology and language associated with anatomy
- Describe the structure, composition and functions of the organs in the human body

vetted

- Comprehend the concepts (& associated principles) for each general type of anatomical structures
- Demonstrate skills in the surface markings of clinically important structures, on normal living bodies and the correlation of structure with function
- Describe concepts of embryology and histology
- Identify histological slides of the human body
- Describe the interdependency and interactions of the structural and functional components of upper limb

COURSE CONTENTS:

CELL BIOLOGY

GENERAL ANATOMY

Terms related to position and movements, the skin and subcutaneous tissues, Layers of skin, Integuments of skin, Glands associated with hair follicle, Microscopic picture of skin

BONES AND CARTILAGES

Osteology, Functions of Bones, Classification of bones, Parts of developing long bones, Blood supply of bones, Lymphatic vessels & nerve supply, Rule of direction of nutrient foramen, Gross structure of long bone, Surface markings, Cartilage, Development of bone and cartilage and Microscopic picture of cartilage and bone

THE MUSCLE

Introduction, Histological Classification, Functions of muscles in general, Type of skeletal muscles, Parts of skeletal muscle and their action and Nomenclature and Microscopic picture of muscle

STRUCTURES RELATED TO MUSCLES & BONES

Tendons, Aponeurosis, Fasciae, Synovial bursae, Tendon Synovial sheaths, Raphaes, Ligaments, Condyle, Epicongyle, Ridge, Tuberosity, Tubercle, Foramen, Canal, Groove, Process and Spur

THE JOINTS

Introduction, Functional classifications, Structural classification, Structures comprising a Synovial joint, Movements of joints, Blood supply of Synovial joints, their nerve supply and lymphatic drainage and Factors responsible for joint stability and Development of joints

CARDIOVASCULAR SYSTEM

Definition, Division of circulatory system into pulmonary & systemic, Classification of blood vessels and their microscopic picture and Heart and its histology and Function of the Heart and Anastomosis

NERVOUS SYSTEM

Definition, Outline of cellular architecture, Classification of nervous system, Parts of the central nervous system, Microscopic picture of cerebrum, cerebellum, spinal cord, Functional components of a nerve, Typical spinal nerve and Microscopic picture of nerve and Introduction of autonomic nervous system and Anatomy of neuromuscular junction

UPPER LIMB

OSTEOLOGY:

Detailed description of all bones of upper limb and shoulder girdle along their musculature and ligamentous attachments

MYOLOGY

Muscles connecting upper limb to the axial skeletal, Muscles around shoulder joint, Walls and contents of axilla, Muscles in brachial region, Muscles of forearm, Muscles of hand, Retinacula and Palmar apouenrosis and Flexor tendon dorsal digital expansion

Vetted

Incharge
Department of Allied Health Sciences
Sargodha Medical College
University of Sargodha

NEUROLOGY

Course, distribution and functions of all nerves of upper limb and Brachial plexus

ANGIOLOGY (CIRCULATION).

Course and distribution of all arteries and veins of upper limb, Lymphatic drainage of the upper limb and Axillary lymph node and Cubital fossa

ARTHROLOGY

Acromioclavicular and sternoclavicular joints, Shoulder joint, Elbow joint, Wrist joint, Radioulnar joints, Inter carpal joints, Joints MCP and IP and Surface Anatomy of upper limb, and Surface marking of upper limb

DEMONSTARIONS:

Demonstration on Shoulder joint, attached muscles and articulating surfaces, Demonstration on Elbow joint, Demonstration on Wrist joint, Demonstration on Radioulnar joint, Demonstration on MCP and IP joints, Demonstration on acromioclavicular joint, Demonstration on sternoclavicular joint and Demonstration on Brachial plexus and Demonstration on Structure of bones

THORAX

STRUCTURES OF THE THORACIC WALL:

Dorsal spine (Vertebrae), Sternum, Costal Cartilages & Ribs, Intercostal Muscles, Intercostal Nerves, Diaphragm, Blood supply of thoracic wall and Lymphatic drainage of thoracic wall and Joints of thorax

THORACIC CAVITY:

Mediastinum, Pleura, Trachea, Lungs, Bronchopulmonary segments, Pericardium, Heart – Its blood supply, venous drainage & nerve supply, Large veins of thorax, superior and in-ferior vena cava., pulmonary veins brachiocephalic veins and Large Arteries – Aorta & its branches

LOWER LIMB

OSTEOLOGY

Detailed description of all bones of lower limb and pelvis along their musculature and ligamentous attachments.

MYOLOGY

Muscles of gluteal region, Muscles around hip joint, Muscles of thigh (anteriorly, posteriorly, laterally and medially) and Muscles of lower leg and foot

NEUROLOGY

Course, distribution, supply of all nerves of lower limb and gluteal region and Lumbosacral plexus.

ANGIOLOGY

Course and distribution of all arteries, veins and lymphatic drainage of lower limb

ARTHROLOGY

Pelvis. Hip joint, Knee joint, Ankle joint, Joints of the foot, Surface Anatomy of lower limb and Surface marking of lower limb

GENERAL HISTOLOGY

Cell, Epithelium, Connective tissue, Bone, Muscles tissue, Nervous tissues, Blood vessels, Skin and appendages and Lymphatic organs

GENERAL EMBRYOLOGY:

Male and female reproductive organs, Cell division and Gametogenesis, Fertilization, cleavage, blastocyst formation and implantation of the embryo. Stages of early embryonic development in second and third week of intrauterine life, Foetal membrane (amniotic cavity, yolk sac, allantois, umbilical cord and Placenta) and Developmental defects

Practical

During study of Gross Anatomy, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in respective year.

RECOMMENDED BOOKS

1. *Gray's Anatomy* by Prof. Susan Standring 39th Ed.,
2. Elsevier, *Clinical Anatomy for, Medical Students* by Richard S.Snell,
3. *Clinically Oriented Anatomy* by Keith Moore,
4. *Clinical Anatomy* by R.J. Last, Latest Ed,
5. *Cunningham's Manual of Practical Anatomy* by G.J. Romanes, 15th Ed., Vol-I
6. *The Developing Human. Clinically Oriented Embryology* by Keith L. Moore, 6th Ed, *Wheater's Functional Histology* by Young and Heath,
7. Latest Ed, *Medical Histology* by Prof.Laiq Hussain, *Neuroanatomy*by Richard S.Snell.

PHYSIOLOGY I

COURSE DESCRIPTION:

Physiology is the integrative study of cellular and whole-body function and is the pivotal discipline linking other basic biomedical sciences on the one hand with the experimental and clinical medicine on the other. The course is designed to explain the physical and chemical mechanisms that are responsible for the origin, development, and progression of life. Two approaches are used to explain events that occur in the human body; one emphasizes the purpose of a body process and the other emphasizes the underlying mechanism by which this process occurs. Physiologists, however, explain how processes occur in the body in terms of cause and-effect sequences of physical and chemical processes. Emphasis in the course will be on normal structure and function of the human body and the approach will be to develop an understanding of the integrative nature of physiological systems to maintain the internal environment of the body within very narrow limits compatible with life.

LEARNING OBJECTIVES

- Define the terminology related to the structure and function of the human body systems
- Compare and contrast the structural and functional characteristics of the various human body cells
- Describe basic chemical concepts and principles as they apply to the structure and functioning of the blood and neuromuscular system
- Analyze the interrelationships of body organ systems, homeostasis, and the complementarity of structure and functioning of the blood and neuromuscular system
- Demonstrate advance techniques to investigate the body and interpret data to be used for diagnosis and treatment
- Define the principles behind medical instrumentation and their usage

COURSE CONTENTS

BASIC AND CELL PHYSIOLOGY

Functional organization of human body, Homeostasis, Control systems in the body, Cell membrane and its functions, Cell organelles and their functions and Genes: control and function

NERVE AND MUSCLE

Structure and function of neuron, Physiological properties of nerve fibers, Physiology of action potential, Conduction of nerve impulse, Nerve degeneration and regeneration. Synapses, Physiological structure of muscle, Skeletal muscle contraction, Skeletal, smooth and cardiac

muscle contraction, Neuromuscular junction and transmission, Excitation contraction coupling, Structure and function of motor unit

Clinical Module

Perform nerve conduction studies and explain their clinical importance. Myopathies and neuropathies. Peripheral nerve injuries

CARDIOVASCULAR SYSTEM

Heart and circulation, Function of cardiac muscle, Cardiac pacemaker and cardiac muscle contraction, Cardiac cycle, ECG: recording and interpretation. Common arrhythmias and its mechanism of development, Types of blood vessels and their function, Haemodynamics of blood flow (local control systemic circulation its regulation and control). Peripheral resistance its regulation and effect on circulation, Arterial pulse, Blood pressure and its regulation, Cardiac output and its control, Heart sounds and murmurs Importance in circulation and control of venous return.. Coronary circulation, Splanchnic, pulmonary and cerebral circulation , Clinical Module

Clinical significance of cardiac cycle, correlation of ECG and heart sounds to cardiac cycle. Clinical significance of cardiac cycle, interpretation of ischemia and arrhythmias. Effects of hypertension. Clinical significance of heart sounds. Effects of ischemia. Shock

RESPIRATORY SYSTEM

Function of respiratory tract, Respiratory and non-respiratory function of the lungs, Mechanics of breathing, Production & function of surfactant and compliance of lungs, Protective reflexes, Lung volumes and capacities including dead space, Diffusion of gases across the alveolar membrane, Relationship between ventilation and perfusion. Mechanism of transport of oxygen and carbon dioxide in blood, Nervous and chemical regulation of respiration, Abnormal breathing, Hypoxia, its causes and effects, Cyanosis, its causes and effects

Clinical Module

Clinical importance of lung function tests. Causes of abnormal ventilation and perfusion. Effects on pneumothoax, pleural effusion, and pneumonia. Respiratory failure. Artificial respiration and uses & effects of O2 therapy. Clinical significance of hypoxia, cyanosis, and dyspnoea

BLOOD

Composition and general functions of blood, Plasma proteins their production and function, Erythropoiesis and red blood cell function, Structure, function, production and different types of haemoglobin, Iron absorption storage and metabolism, Blood indices, Function, production and type of white blood cells, Function and production of platelets, Clotting mechanism of blood, Blood groups and their role in blood transfusion, Complications of blood transfusion with reference to ABO & RH incompatibility, Components of reticuloendothelial systems, gross and microscopic structure including tonsil, lymph node and spleen, Development and function of reticuloendothelial system

Clinical Module

Anemia and its different types. Blood indices in various disorders. Clotting disorders. Blood grouping and cross matching. Immunity

SKIN AND BODY TEMPERATURE REGULATION + SPORT PHYSIOLOGY

Practical

HEMATOLOGY

Use of the microscope. Determination of haemoglobin. Determination of erythrocyte sedimentation rate. Determining packed cell volume. Bleeding and clotting time tests. RBC count. Red cell indices. WBC count. Leukocyte count. Prothrombin and thrombin time

RESPIRATORY SYSTEM

Clinical examination of chest. Pulmonary volume, their capacities and clinical interpretation. Stethography

CARDIOVASCULAR SYSTEM

Cardiopulmonary resuscitation (to be coordinated with the department of medicine), Examination of arterial pulse, ECG recording and interpretation, Arterial blood pressure, Effects of exercise and posture on blood pressure, Apex beat and normal heart sounds

RECOMMENDED BOOKS

1. Textbook of Physiology by Guyton and Hall, Latest Ed.
2. Review of Medical Physiology by William F. Ganong, Latest Ed.
3. Physiology by Berne and Levy, Latest Ed.
4. Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D. Richards
5. Physiological Basis of Medical Practice by John B. West and Taylor, 12th Ed.

BIOCHEMISTRY & GENETICS I

COURSE DESCRIPTION

The knowledge and skills in fundamental and introductory biochemistry is provided that are essential for further studies. This course provides a basic understanding of life processes at the biochemical molecular level. It provides an understanding of the normal biochemical processes in the human body in which the function of the various organs and tissues are integrated. It covers introduction to the biomolecules i.e. amino acid, proteins carbohydrates, fats, enzymes and nucleic acids, and the nutritional biochemistry concludes the course. It also familiarizes the students with laboratory instruments / equipment used in biochemistry laboratory.

LEARNING OBJECTIVES

At the end of the course, the student should be able to demonstrate his knowledge and understandingon the subject with following learning objectives:

- Describe molecular and functional organization of a cell, and sub-cellular components in the context of chemistry and human biochemistry.
- Basic knowledge of structure, function and interrelationship of biomolecules and consequences of deviation from normal.
- Learning and understanding the properties, classification and functions of biomolecules with emphasis on amino acid, peptides, proteins, carbohydrates, lipids and nucleic acid.
- Having a clear understanding of the fundamental aspects of enzymology & its clinical applications.
- Explain importance of nutritional biochemistry with emphasis on minerals, trace elements, vitamins and balance diet.

COURSE CONTENTS

CELL

Introduction to Biochemistry, Cell: (Biochemical Aspects), Cell Membrane Structure, Membrane Proteins, Receptors & Signal Molecules

BODY FLUIDS

Structure and properties of Water, Weak Acids & Bases, Concept of pH &pK, Buffers& their mechanism of action, Body buffers

BIOMOLECULES

AMINO ACIDS, PEPTIDES & PROTEINS

Amino acids: Classification, Acid-Base Properties, Functions & Significance, Protein Structure, Primary, Secondary & Super secondary. &, Structural Motifs, Tertiary & Quaternary Structures of Proteins, Protein Domains, Classification of Proteins, Fibrous proteins, Globular proteins, Hemo-proteins and their clinical implications (such as jaundice etc)

ENZYMES

Introduction, Classification & Properties of Enzymes, Coenzymes, Isozymes & Proenzymes, Regulation & Inhibition of Enzyme activity & enzymes inhibitors, Clinical Diagnostic Enzymology

Vetted mus

CARBOHYDRATES
Definitions, Classification, Biochemical Functions & Significance of Carbohydrates, Structure & Properties of Monosaccharides & Oligosaccharides, Structure & Properties of Polysaccharides, Bacterial cell Wall, Hetero-polysaccharides, Glycosaminoglycans(GAGs)
LIPIDS
Classification of Lipids, Fatty Acids: Chemistry, Classification occurrence & Functions, Structure & Properties of Triacylglycerols and Complex Lipids, Classification & Functions of Eicosanoids, Cholesterol: Chemistry, Functions & Clinical Significance, Bile acids/salts
NUCLEIC ACIDS
Structure, Functions & Biochemical Role of Nucleotides. Structure & Functions of DNA, Structure & Functions of RNA
MINERALS
Sources. RDA, Biochemical Functions & Clinical Significance of Calcium & Phosphorus. Sources. RDA, Biochemical Functions & Clinical Significance of Sodium, Potassium, Chloride. Biochemical Functions & Clinical Significance of Iron, Copper, Zinc, Manganese, Magnesium, Selenium. Iodine and Fluoride
VITAMINS
Sources. RDA& Biochemical Functions & Clinical Significance of Fat-Soluble Vitamins, Sources. RDA& Biochemical Functions & Clinical Significance of Water-Soluble Vitamins
NUTRITION
Dietary Importance of Carbohydrates, Lipids & Proteins and other dietary Ingredients. Balanced Diet. Diet in specialized conditions

Practical

1. Working SOPs for a Biochemistry Practical Laboratory. Introduction to Laboratory Equipments and Techniques. Preparation of solution (Normal, Molar Equivalent solution etc).
2. Molisch's Test & Iodine Test. Benedict's Test &Barfoed's Test. Selivanoff's Test &Phenylhydrazine Test. Sucrose Hydrolysis. Starch Hydrolysis.
3. Biuret Test, Heat Coagulation Test & Salt Saturation Test. Ninhydrin Test, Xanthoproteic Test &Millon-Nasse's Test. Aldehyde Test, Sakaguchi's Test. Determination of Isoelectric pH of casein Protein.
4. Emulsification of natural fat & Solubility of soap, Test for Cholesterol, Iodine & Peroxide value calculation. Saponification value calculation
5. Sample Collection & Physical Evaluation of Urine. Analysis of Normal Urine. Analysis of Abnormal Urine

RECOMMENDED BOOKS

1. Harper's Biochemistry by Robbert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwel (Latest Edition).
2. Lippincott's Illustrated Review of Biochemistry by Pamela C. Champe and Richard A. Harvey (Latest Edition).
3. Practical Clinical Biochemistry by Varley (Latest Edition).
4. Textbook of Biochemistry by Devlin (Latest Edition).
5. Textbook of Medical Biochemistry by M.A. Hashmi (Latest Edition).
6. Biochemistry by Stryer (Latest Edition).

Vetted

FUNDAMENTAL OF PUBLIC HEALTH

COURSE DESCRIPTION

This course introduces students to public health concepts and practice. It providesa broadoverviewof the field of public health and a focused look at the core areas of epidemiology and biostatistics,healthpromotion, environmental health, and health care administration. This course is designed to lay the groundwork for all future coursework and introduce students to specialty areaswithinpublic health.

LEARNING OBJECTIVES

At the end of this course, the students will be:

- Able to demonstrate the basics of Public Health and various sub-disciplines of Public Health.
- Familiar with all the basic laboratory procedures and the principles for working in the Public Health department.
- Well aware of the responsibilities of Public Health professionals
- Know about the proper use of PPEs

COURSE CONTENTS

What is public health, principles of public health, Historical perspectives, philosophy and values
Core functions of public health and essential services
Inequalities of health
Health promotion, vulnerable groups
Role of quantitative and qualitative methods and sciences in describing and assessing a population's health
Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening etc
Effects of environmental factors on a population's health
Biological and genetic factors affecting population's health
Behavioral and psychological factors affecting population's health
Social, political and economic determinants of health and how they contribute to population health and health inequities
How globalization affects global burdens of disease
Ecological perspective on the connection among human health, animal health and ecosystem health (eg, One Health)

Introduction to Sociology of Health and Disease
Introduction to Psychology
Introduction to Medical Anthropology
Personal Hygiene

1. Introduction to Personal Hygiene
    - Hand wash
    - Eye hygiene
    - Hair hygiene
    - Body hygiene
    - Oral hygiene
    - Nails and cuticles
    - Feet and shoes
    - Protection from noise and UV Light
    - Control of foul odour
2. Role of personal hygiene in communicable and Non communicable diseases
3. Types of cleanliness (intrinsic & extrinsic)

Vetted

Incharge
Department of Allied Health Sciences
Sargodha Medical College
University of Sargodha

4. Prevention of cough cold and other contagious disease
5. Smoking and protecting rights of others
6. Personal hygiene at home
    - Clothes
    - Kitchen
    - Washroom
7. Personal hygiene at schools
8. Personal hygiene at surroundings
9. Personal hygiene at work place
10. Cleanliness and religion

Introduction to Professional Ethics

Concept of Health and Disease

1. Concept of health
2. Dimensions of health
3. Definition of health
4. Health spectrum
5. Determinants of health
6. Responsibility of health
7. Indicators of health
8. Concept of disease
9. Concept of causation
10. Levels of prevention
11. Historical background of public health
12. Evolution of public health
13. Definitions of common public health terms
14. Health for all

Fundamental Principles of Infectious Disease

1. Infection, Contamination, Pollution, Infestation, Infectious Disease, Communicable Disease, Contagious Disease
2. Host, Immune and Susceptible Person
3. Sporadic, Endemic, Epidemic, Pandemic, Epizootic, Exotic and Zoonotic
4. Contact, Fomites, Carriers, Vectors and Reservoir of Infection
5. Incubation, Infective, Prodromal Period and Generation Time
6. Cross Infection, Nosocomial, Opportunistic Infection and Iatrogenic Disorders
7. Surveillance, Eradication and Elimination
8. Reservoir and Source of Infections
9. Escape of Organism, Mode of Transmission,Entry Into the Body, Susceptible HostandHost Defenses (Immunity)
10. Controlling the Reservoir, Early Diagnosis and Treatment, Isolation, Quarantine, Disinfection Interruption of Transmission

Basic Epidemiology

Introduction to Community Nutrition

Environment& Occupational Health

1. Air Pollution, its Hazards and Prevention
2. Noise Pollution, its Hazards and Prevention
3. Water Pollution, its Hazards and Prevention
4. Water Purification
5. Radiation, its Hazards and Prevention
6. Waste Management
7. Ozone Layer Depletion
8. Climate Change and Global Warming
9. Pakistan's vulnerability to climate change
10. Introduction to Occupational Health
11. Evolution of Occupational Health (Labor Movements)
12. Occupational Health Hazards and its Prevention

13. Work Place Safety
14. Prevention of hospital based health hazards in hospital workers
15. Social Security
16. Prevention of Gender Harassment

Practical

Different survey and preparation of documents. Demonstrations about the sanitary requirements in respect of slaughter houses and animal handlers, Inspection on personal hygiene

RECOMMENDED BOOKS

1. Text book of Community Medicine by: Park J E. Latest Edition
2. Horton, Paul B. and Chester L. Hunt, 1984 Sociology, Singapore: Megraw Hill Book Co.
3. Moon, Graham, 1995. Society and Health; An introduction to Social Science for Processionals, London: Routledge.
4. Rehabilitation Research (Principles and Applications) 3rd Edition By Elizabeth Domholdt
5. Textbooks of Community Medicine, by Prof. H. A. Siddique (2nd Edition).
6. A Handbook of Behavioural Sciences for Medical and Dental Students By: M H Rana, S Ali and M Mustafa, , University of Health Sciences Lahore
7. Developmental Psychology for Healthcare Professions By: Katherine A Billingham

ENGLISH

COURSE DESCRIPTION

The course introduces the students to the underlying rules to acquire and use language in academic context. The course aims at developing grammatical competence of the learners to use grammatical structures in context in order to make the experience of learning English more meaningful enabling the students to meet their real life communication needs. The objectives of the course are to, reinforce the basics of grammar, understand the basic meaningful units of language, and introduce the functional aspects of grammatical categories and to comprehend language use by practically working on the grammatical aspects of language in academic settings. After studying the course, students would be able to use the language efficiently in academic and real life situations and integrate the basic language skills in speaking and writing. The students would be able to work in a competitive environment at higher education level to cater with the long term learners' needs.

LEARNING OBJECTIVES

Enable the students to meet their real life communication needs.

COURSE CONTENTS:

Comprehension; Answers to questions on a given text
Translation skills; Urdu to English
Paragraph writing; Topics to be chosen at the discretion of the teacher
Paragraph writing; Practice in writing a good, unified and coherent paragraph
Essay writing; Introduction
CV and job application; Translation skills, Urdu to English
Study skills; Skimming and scanning, intensive and extensive, and speed reading, summary and précis writing and comprehension

Vetted

Academic skills; Letter/memo writing, minutes of meetings, use of library and internet
How to write a proposal for research paper/term paper
How to write a research paper/term paper (emphasis on style, content, language, form, clarity, consistency). Technical report writing, Progress Report writing

RECOMMENDED BOOKS

1. Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN 0194313492
2. Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN 0194313506
3. Writing. Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41 45-53.
4. Reading. Upper Intermediate. Brain Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 453402 2.
5. Writing. Upper-Intermediate by Rob Nolasco. Oxford Supplementary Skills. Fourth Impression 1992. ISBN 0 19 435406 5 (particularly good for writing memos, introduction to presentations, descriptive and argumentative writing).
6. Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.

INTRODUCTION TO COMPUTER

COURSE DESCRIPTION

This is an introductory course on information and communication technologies. Topics include ICT terminologies, hardware and software components, the internet and World wide web, and ICT based applications. Students will get basic understanding of computer software, hardware, and associated technologies. This course is aimed to introduce computer and its basic numerical methods, data bases, networking, etc. World wide web and basic terms of databases, ICT on internet will also be discussed and taught to the students. Techniques of information search, objectives include basic understanding of computer software, hardware, and associated technologies. How computers can be used in the workplace, how communications systems can help boost productivity, and how the Internet technologies can influence the workplace. The course is designed to equip and train students in basics of computers, internet resources, and several software required nowadays to complete the assignments, to design presentation. Course will also cover computer ethics and related social media norms and cyber laws.

LEARNING OBJECTIVES

After completing this course, a student will be able to:

- Understand different terms associated with computer and information technology.
- Identify various components of a computer system.
- Identify the various categories of software and their usage.
- Define the basic terms associated with communications and networking.
- Understand different terms associated with the Internet and World Wide Web.
- Use various web tools including Web Browsers, E-mail clients and search utilities.
- Use text processing, spreadsheets and presentation tools.
- The enabling/pervasive features of computer and information technology.

Vetted

COURSE CONTENTS:

Basic Definitions & Concepts
Hardware: Computer Systems & Components
Storage Devices, Number Systems
Software: Operating Systems, Programming and Application Software
Introduction to Programming, Databases and Information Systems
Networks
Data Communication
The Internet, Browsers and Search Engines
The Internet: Email, Collaborative Computing and Social Networking
The Internet: E-Commerce
IT Security and other issues

RECOMMENDED BOOKS

1. Introduction to Computers by Peter Norton, 6th International Edition (McGraw HILL)
2. Using Information Technology: A Practical Introduction to Computer & Communications by Williams Sawyer, 6th Edition (McGraw HILL)
3. Computers, Communications & information: A user's introduction by Sarah E. Hutchinson, Stacey C. Swayer
4. Fundamentals of Information Technology by Alexis Leon, Mathewsleon Leon press

2nd Year

1.	Anatomy II	200 Marks
2.	Physiology II	200 Marks
3.	Biochemistry&Genetics II	200 Marks
4.	Medical Instrumentation	200 Marks
5.	Islamic Studies	100 Marks
6.	Pak Studies	100 Marks
	Total Marks	**1000 Marks**

ANATOMY II

COURSE DESCRIPTION

The main aim of this course is to train and teach the students of second year BS degree program in such a way that they can practically apply the concepts of this subject which forms the firm foundation for the art of healing (medicine). The curriculum equips the students with the clear and comprehensive knowledge of human body structural organization. The knowledge sharing is done with the students as it is the science of macro/micro structure and forms of the human body. The topics within the domain of Anatomy include Histology or Microscopic Anatomy, Embryology or Developmental Anatomy, Regional or Gross Anatomy and Neuroanatomy which highlight the importance of the structural Anatomy. Our teaching methodology involves group discussions, lectures and practical. At the end of the course study, the student will be able to understand the basic knowledge of structure, histology and development of the Abdomen, Pelvis, Head, Neck and Brain Regions.

LEARNING OBJECTIVES

- Describe gross anatomy of neuro-musculoskeletal and circulatory system of lower limb, abdominal wall and pelvis.

Incharge
Dep... Health Sciences
...l College
University of Sargodha

- Demonstrate anatomical landmarks and configuration of the lower limb, abdominal wall and pelvis through dissection/identification of structures in the manicans / smart board systems supplemented with the study of charts, models, prosected materials, and radiographs.
- Describe major stages of embryological development of the lower limb with development of the neurological and vascular supplies to the lower limb.

COURSE CONTENTS:

EMBRYOLOGY:

SPECIAL: Musculoskeletal system, cardiovascular system, CNS

THE HEAD AND NECK

THE NECK:

Muscles around the neck, Triangles of the neck, Main arteries of the neck, Main veins of the neck, Cervical part of sympathetic trunk, cervical plexus, cervical spine (Vertebrae), Joint of neck

THE FACE:

Sensory nerves of the face, Bones of the face, Muscles of the face, Facial nerve, Muscles of mastication, Mandible, Hyoid bone, Temporomandibular joint, Brief description of orbit and nasal cavity

THE SKULL:

Bones of skull, Anterior cranial fossa, Middle cranial fossa, Posterior cranial fossa, Base of skull and Structures passing through foramina

NEURO ANATOMY

Central Nervous System: Disposition, Parts and Functions, Brain stem (Pons, Medulla, and Mid Brain), Cerebrum, Cerebellum, Thalamus, Hypothalamus, Internal Capsule, Blood Supply of Brain, Stroke and its types, Ventricles of Brain, CSF circulation and Hydrocephalus, Meninges of Brain, Neural pathways (Neural Tracts), Pyramidal and Extra pyramidal System (Ascending and Descending tracts), Functional significance of Spinal cord level, Cranial Nerves with special emphasis upon IV, V, VII, XI, XII (their course, distribution, and palsies), Autonomic nervous system, its components and Nerve receptors

SPINAL CORD

Gross appearance, Structure of spinal cord, Grey and white matter (brief description), Meninges of spinal cord, Blood supply of spinal cord and Autonomic Nervous system

ABDOME; ABDOMINAL WALL:

Structures of anterior abdominal wall: superficial and deep muscles, Structure of rectus sheath, Structures of Posterior abdominal wall, Lumbar spine (vertebrae), Brief description of viscera.

PELVIS

Brief description of anterior, posterior and lateral walls of the pelvis, Inferior pelvic wall or pelvic floor muscles, Sacrum, Brief description of perineum and Nerves of perineum.

Practical

During study, emphasis should be given on applied aspect, radiological anatomy, surface anatomy and cross-sectional anatomy of the region covered in the respective semester /year

RECOMMENDED BOOKS

1. Gray's Anatomy by Prof. Susan Standring 39th Ed., Elsevier.
2. Clinical Anatomy for Medical Students by Richard S.Snell.
3. Clinically Oriented Anatomy by Keith Moore.
4. Clinical Anatomy by R.J. Last, Latest Ed.

Vetted

5. Cunningham's Manual of Practical Anatomy by G.J. Romanes, 15th Ed., Vol-I, II and III.
6. The Developing Human. Clinically Oriented Embryology by Keith L. Moore, 6th Ed.
7. Wheater's Functional Histology by Young and Heath, Latest Ed.
8. Medical Histology by Prof.Laiq Hussain.
9. Neuroanatomyby Richard S.Snell

PHYSIOLOGY II

COURSE DESCRIPTION

Physiology is the integrative study of cellular and whole-body function and is the pivotal discipline linking other basic biomedical sciences on the one hand with the experimental and clinical medicine on the other. The course is designed to explain the physical and chemical mechanisms that are responsible for the origin, development, and progression of life. Two approaches are used to explain events that occur in the human body; one emphasizes the purpose of a body process and the other emphasizes the underlying mechanism by which this process occurs. Physiologists, however, explain how processes occur in the body in terms of cause and-effect sequences of physical and chemical processes. Emphasis in the course will be on normal structure and function of the human body and the approach will be to develop an understanding of the integrative nature of physiological systems to maintain the internal environment of the body within very narrow limits compatible with life.

LEARNING OBJECTIVES

- Describe functions of gastrointestinal tract, endocrinology and cardiovascular system
- Describe physiology at the molecular, metabolic/cellular, tissue and systems levels
- Differentiate the physiological responses in normal function and disease stages

COURSE CONTENTS:

NERVOUS SYSTEM

General organization of the nervous system, Classification of nerve fibers, Properties of synaptic transmission, Function of neurotransmitters and neuropeptides, Type and function of sensory receptors, Function of the spinal cord and ascending tracts, Reflex action and reflexes, Muscle spindle and muscle tone, Mechanism of touch, temperature and pain., Functions of the cerebral cortex, Difference between the sensory and motor cortex and their functions, Motor pathways including pyramidal and extrapyramidal, Basal Ganglia and its functions, Cerebellum and its function, Control of posture and equilibrium, Physiology of sleep, Physiology of memory, Mechanism and control of speech, Function of the thalamus, Function of the hypothalamus and limbic system, Production of CSF.

Clinical Module

Significance of dermatomes. Injuries of the spinal cord. Hemiplegia and paraplegia. Parkinsonism. Effects of cerebellar dysfunction.

REPRODUCTION

Production and function of testosterone and Physiological changes during male puberty, Function of the female reproductive system, Production and function of oestrogen, and progesterone, Menstrual cycle, Physiological changes during female puberty and menopause.

Clinical Module

Male infertility. Female infertility. Basis for pregnancy tests.

GASTROINTESTINAL TRACT

General function of gastrointestinal tract, Enteric nervous system, control of gastrointestinal motility and secretion, Mastication, Swallowing: mechanism and control, Function, motility and secretions of stomach, Function, motility and secretions of small intestine, Function, motility and secretions of large intestine, Function of GIT hormones, Mechanism of vomiting and its control pathway, Defecation and its control pathway, Functions of liver, Functions of, gallbladder and bile in digestion and Endocrine & exocrine pancreas and functions of pancreas in digestion

Vetted
MUS

Clinical Module

Dysphagia. Physiological basis of acid peptic disease. Causes of vomiting. Diarrhea and constipation in clinical settings. Jaundice and liver function tests in clinical settings

ENDOCRINOLOGY

Classification of endocrine glands, Mechanism of action, feedback and control of hormonal secretion, Functions of the hypothalamus, Hormones secreted by the anterior and posterior pituitary and their mechanism of action and function.. Function of the thyroid gland, Function of the parathyroid gland, Calcium metabolism and its regulation, Secretion and function of calcitonin, Hormones secreted by the adrenal cortex and medulla, and their function and mechanism of action, Endocrine functions of the pancreas, Control of blood sugar. Hormones secreted by the gastrointestinal system and their function, Function of the thymus and The endocrine functions of the kidney and Physiology of growth.

Clinical Module

Acromegaly, gigantism and dwarfism. Effects of panhypopitutiarism. Diabetes insipidus. Thyrotoxicosis and myxoedema. Pheochromocytoma. Cushing's disease. Adrenogenital syndrome. Diabetes mellitus and hypoglycemia.

BODY FLUIDS AND KIDNEY

Components and quantitative measurements of body fluids, Fluid compartments, tissue and lymph fluid, Structure of the kidney and nephron, General function of the kidney, GFR and its regulation, Formation of urine including filtration, re-absorption and secretion, Plasma clearance., Mechanism of concentration and dilution of urine, Water and electrolyte balance with reference to the kidney, Role of the kidney in blood pressure regulation, Hormonal functions of the kidney, Acidification of urine and its importance, Acid base balance with reference to the kidney and Micturition and its control.

Clinical Module

Renal function tests and their clinical importance. Fluid excess and depletion. Renal failure and dialysis. Metabolic acidosis and alkalosis. Abnormalities of micturition.

Practical

Nervous System

Examination of superficial and deep reflexes. Brief examination of the motor and sensory system. Examination of the cranial nerves.

RECOMMENDED BOOKS

1. Textbook of Physiology by Guyton and Hall, Latest Ed.
2. Review of Medical Physiology by William F. Ganong, Latest Ed.
3. Physiology by Berne and Levy, Latest Ed.
4. Human Physiology: The Basis of Medicine by Gillian Pocock, Christopher D. Richards
5. Physiological Basis of Medical Practice by John B. West and Taylor,12th Ed

BIOCHEMISTRY & GENETICS II

COURSE DESCRIPTION

The knowledge and skills in fundamental and introductory biochemistry is provided that are essential for further studies. This course provides a basic understanding of life processes at the biochemical molecular level. It provides an understanding of the normal biochemical processes in the function of the various organs and tissues with the principles of metabolic integration giving the genetic, biochemical and molecular understanding of the biochemical basis of various disease processes. It also familiarizes the students with laboratory instruments / equipment used in biochemistry laboratory with modem biochemical techniques and their uses in the diagnosis of diseases especially genetic diseases.

Vetted

LEARNING OBJECTIVES

At the end of the course, the student should be able to demonstrate his knowledge and understanding on the subject with following learning objectives:

- To learn basic understanding with the homeostatic mechanisms through the concepts of inter-regulation of carbohydrates, lipids and protein metabolism and its relation to hormone actions in the human body.
- To learn and understand the basic biochemical processes taking place in the body, and understanding their relation with normal and abnormal human metabolism.
- To learn how large molecules are synthesized and used, and how energy is generated, stored, and retrieved (metabolism). And to have understanding and knowledge about how diseases are related to biochemical defects.
- To learn and describe respiration at cellular and molecular level and to explain the various biochemical pathways related to metabolism of carbohydrates, protein, lipids and nucleic acid.
- Applying basic knowledge of protein synthesis, post translational modification and targeting to its cellular destination.
- To learn and understand the molecular mechanisms of gene expression, the principles of genetic engineering & their applications in medicine.
- To learn and understand the basics of Molecular Medicine, Gene therapy and Stem Cell therapy in Physical Therapeutics.
- To have the basic principles and to make use of techniques/instruments to perform biochemical analysis relevant to clinical screening & diagnosis.

COURSE CONTENTS:

BIOENERGETICS

Introduction to Bioenergetics, Biological Oxidations and Electron Transport Chain and Oxidative Phosphorylation

METABOLISM OF CARBOHYDRATES

Digestion & Absorption of Carbohydrates, Glycolysis & its Regulation, Citric Acid Cycle, Metabolism of Glycogen, Gluconeogenesis and regulation of blood glucose and Pentose Phosphate Pathway & its Significance, Alcohol Metabolism

METABOLISM OF LIPIDS

Digestion & Absorption of Lipids, Metabolism & Clinical Significance of Lipoproteins, Fatty acid oxidation,fatty acid biosynthesis and metabolism of Triacylglycerols, Metabolism & clinical Significance of Cholesterol, Metabolism of Eicosanoids

METABOLISM OF PROTEINS & AMINO ACIDS

Digestion of Proteins & Absorption of Amino Acids, Transamination & Deamination of Amino Acids and urea cycle and Specialized products formed from Amino Acids

Metabolism of Nucleic Acids

HORMONES

Classification & Mechanism of Action of Hormones, Signal Transduction, Second Messengers and Receptors, Hypothalamic & Pituitary Hormones, Steroid Hormones: Glucocorticoids and Mineralocorticoids, Insulin & Glucagon and brief introduction to the Diseases related to hormones abnormalities

MOLECULAR BIOLOGY

Structural Organization of Chromosome and Genes, Replication, Transcription and Translation (Protein synthesis)in Prokaryotes & Eukaryotes, Regulation of Gene Expression, Mutations and DNA repair mechanisms,Recombinant DNA Technology, Polymerase Chain Reaction, Blotting Techniques, Nucleic acid hybridization assays

Vetted

Incharge
Department of Allied Health Sciences
Sargodha Medical College
University of Sargodha

Practical

1. Techniques of Instruments in Clinical Biochemistry with examples.
2. Visible Spectrophotometry. Flame photometry. UV & IR spectrophotometry. Atomic Absorption spectrophotometry. pH Metry. Chromatography and determination of Amino Acids in Urine by paper chromatography
3. Clinical quantitative analysis in Biochemistry
   - Serum Glucose Estimation. Glucose tolerance Test (GTT). Serum Cholesterol estimation (Total, HDL and HDL cholesterol). Serum Bilirubin Estimation (Total, Direct and Indirect bilirubins). Serum Proteins Estimation (Total, Albumin & Globulin). Serum Total lipids Estimation. Serum calcium Estimation (total, ionized & unionized). Serum Uric acid Estimation. Serum Urea Estimation. Serum Creatinine Estimation. Enzymes Estimation in Serum: AST, ALT, ALP, Creatine Kinase (CK) and LDH.

RECOMMENDED BOOKS

1. Harper's Biochemistry by Robbert K. Murray, Daryl K. Granner, Peter A. Mayes, Victor W. Rodwel (Latest Edition).
2. Lippincott's Illustrated Review of Biochemistry by Pamela C. Champe and Richard A. Harvey (Latest Edition).
3. Practical Clinical Biochemistry by Varley (Latest Edition).
4. Textbook of Biochemistry by Devlin (Latest Edition).
5. Biochemistry by Stryer (Latest Edition).by Stryer, Lubert, Latest Ed

MEDICAL INSTRUMENTATIONS

COURSE DESCRIPTION

This course is designed to provide general knowledge of basic Public Health laboratory instruments to undergraduate students of Public Health LabSciences. Emphasis is placed on theoretical concepts of instruments, components, functions and their operations, calibration and troubleshooting of instruments. This interactive course covers the various instruments used for vector control, food safety, water safety,chlorine testing and Autoclave. Additionally, the students are made conversant with the general principles and handling of instruments which are used in community and field survey.

LEARNING OBJECTIVES

Upon completion, students will possess the theoretical knowledge, skills, and abilities to:

- Understand the working principles, components and their functions of biomedical instruments & Chemicals used in the field of Allied Health Sciences for diagnostic and research.
- Operate and calibrate all these instruments mention in course content list efficiently.
- Understand importance of precaution to be taken while working with instruments & Chemicals.
- Detect errors and dealing with the accidents due to mishandling.
- Ask for routine instruments service in time.
- Selection and buying of medical instruments.
- Care and routine maintenance of these instruments.

COURSE CONTENTS

Vetted

Different relevant Techniques used in Medical fields. The names of instruments used, based upon different Techniques for working and evaluation of different parameters in Medical fields. Normal functioning of these instrument, parts of these instruments & individual functions of these parts. Their trouble shootings and routine manipulations to obtain correct results. Maintenance of Sensitivity & Specificity of these instruments. The general study of following Medical Instruments available in Medical fields:

1. Public Health Equipment
2. Spray pump(vector control)
3. Food sampling kit (food safety)
4. Protective gear (uniform)
5. Aflatoxin testing kit (food safety)
6. Water sampling kit (water safety)
7. Chlorine taps(water treatment)
8. DPD Tablets(chlorine testing)
9. Sphygmomanometer(BP Machine)
10. Refrigerator, EPI
11. Autoclave
12. Infant weighing scale
13. Suction machine
14. First Aid Equipment: CPR, Defibrillator
15. Bandages, Ace bandage, compression stocking, Snakebite kit, Heating pad, Traction, Ostomy care, Tracheotomy care, Defibrillator
16. Respiratory Equipment
17. Ventilator, continuous positive airway pressure, bi-level positive airway pressure, and demand positive airway pressure equipment
18. Oxygen cylinder, Oxygen concentrator, Nebulizer, Masks and cannulas, Respiratory supplies, Cough assist machine, Suction machine, Manual resuscitation bags with face mask
19. Meters/Monitors
20. Thermometer, Stethoscope, Blood glucose meter, Blood coagulation (PT/INR) meter, Pulse oximeter, Weight scale, Blood pressure monitor, Apnea monitor, Electrocardiogram monitor, Fetal monitor
21. Voiding Equipment
22. Catheter
23. Colostomy bags
24. Infant Care
25. Incubator, Radiant warmer, Bilirubin lights, Phototherapy, Apnea monitor
26. Insulin infusion pump
27. Implantable cardioverter defibrillator
28. Automatic implantable cardioverter defibrillator with cardiac resynchronization
29. Ventricular (assist) bypass device
30. Mechanical walker
31. Implantable pacemaker pulse generator
32. Piston syringe
33. Intravascular administration set, and
34. Continuous ventilator
35. Ice liner for vaccine storage
36. Cold chain equipment's

Vetted

37. Vaccine carrier box

Practical

Working and handling of different instruments.

RECOMMENDED BOOKS

1. Practical Sanitation: A Handbook for Sanitary Inspectors and Others; WithApx. On Sanitary Law, by Herbert Manley by George Reid
2. Practical Sanitation: A Handbook for Sanitary Inspectors and Others Interested in Sanitation by George Reid and Herbert Manley
3. Sanitary Inspectors' Practical Guide: With Inspection of Lodging-Houses (Under Sanitary Acts) and the Sale of Food & Drugs Amendment Act, 1879 for Sanitary ... and Local Board Districts of England by Joseph Robinson
4. Sanitary Inspector's Handbook;: A manual for sanitary inspectors and other executive public health officers, by Henry Hurrell Clay
5. Elementary Sanitary Engineering in India;: A text-book for Indian sanitary inspectors and others interested in the application of the science of sanitary engineering to tropical conditions, by George Brans by Williams
6. The Australian sanitary inspector's text book / by John L. Bruce and Theodore Mailler Kendall
7. Sanitary Inspector, Volume IV by Maine State Board Of Health.
8. Food Hygiene Microbiology and HACCP By S. J. Forsythe, P. R. Hayes.
9. Food Hygiene and Sanitation by SunetraRoday.

ISLAMIC STUDIES

COURSE DESCRIPTION

This course is aimed at to provide Basic information about Islamic Studies, enhance understanding of the students regarding Islamic civilization, improve student's skill to perform prayers and other worships, enhance the skill of the students for understanding of issues related to faith and religious life. Enhance the general knowledge of the students regarding the Muslim world and its current political, economic, social, and defence problems. Students will discuss different current issues being faced by the Muslim World and the importance of unity and cooperation among Muslim countries. In this regard, they will learn about different projects and cooperation among Muslim countries, the Islamic religious tradition within historical, social and cultural contexts; visual, performative and oral expressions of the heritage of Islam, including language, literature, art, and architecture; intra-Islamic differences and issues of inter-cultural diversity and integration within the Islamic world; the political systems of Muslim majority countries.

LEARNING OBJECTIVES

This course is aimed at:

1 To provide Basic information about Islamic Studies
2 To enhance understanding of the students regarding Islamic Civilization
3 To improve Students skill to perform prayers and other worships
4 To enhance the skill of the students for understanding of issues related to faith and religious life.

Vetted

COURSE CONTENTS:

FUNDAMENTAL BELIEFS AND PRACTICES OF ISLAM.

Tauheed (Unity of Allah), Risalat (Finality of the Prophet-hood). Akhirat (Day of Judgement).,Salat, Soum, Zakat, Hajj and Jehad

NEED OF RELIGION AND ITS ROLE IN HUMAN LIFE.

MORALITY IN ISLAM.

Concept of morality, Concept of morality and Faith., Islamic principles and methods of character building., Moral values in Islam.

RIGHTS OF THE INDIVIDUAL IN ISLAM.

QURAN AS A GUIDE FOR THE MODERN SOCIETY AND SCIENTIFIC DEVELOPMENT.

HOLY PROPHET (PEACE BE UPON HIM) AND HIS LIFE.

ISLAMIC CONCEPT OF STATE.

ISLAM AND SOCIETY.

Role of man and women in society, Rights of women children in Islam. Concept of woman's freedom in Islam., Hukook-ul-Ibad.

IMPORTANCE OF RIZK-E-HILAL.

CONTRIBUTION OF ISLAMIC SCHOLARS IN SCIENCE AND MEDICINE.

RECOMMENDED BOOKS

1. Introduction to Islam by Dr.Hamidullah.
2. Islam: Its meaning and message by Khurshid Ahmad
3. اسلام یک نظر میں مولانا صدر الدین اصلاحی
4. قرآن اور تعمیر سیرت ڈاکٹر میر ولی الدین

PAKISTAN STUDIES

COURSE DESCRIPTION

The course is designed to acquaint the students of BS Programs with the rationale of the creation of Pakistan. The students would be apprised of the emergence, growth and development of Muslim nationalism in South Asia and the struggle for freedom, which eventually led to the establishment of Pakistan. While highlighting the main objectives of national life, the course explains further the socioleconomic, political and cultural aspects of Pakistan's endeavours to develop and progress in the contemporary world. For this purpose, the foreign policy objectives and Pakistan's foreign relations with neighbouring and other countries are also included. This curriculum has been developed to help students analyse the socio-political problems of Pakistan while highlighting various phases of its history before and after the partition and to develop a vision in them to become knowledgeable citizens of their homeland.

LEARNING OBJECTIVES

- Develop vision of historical perspective, government, politics, Contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

COURSE CONTENTS:

IDEOLOGY OF PAKISTAN.

Vetted

Incharge
Department
Health Sciences

Definition and elucidation. Historical aspect. Ideology of Pakistan in the light of speeches and sayings of Allama Iqbal and Quaide-Azam.

PAKISTAN MOVEMENT

Basis for the creation of Pakistan. Historical developments: 1857-1947

POLITICAL DEVELOPMENTS IN PAKISTAN SINCE 1947

LAND AND PEOPLE OF PAKISTAN

Geography, Society, Culture, Natural resources, Health and education with reference to characteristics trends and problems.

RECOMMENDED BOOKS

1. Ideological Orientations of Pakistan by Sharif Al Mujahid.
2. Struggle for Pakistan by I.H. Qureshi.
3. The Making of Pakistan by Richard Symond

3rd Year

1.	General Pathology & Microbiology	200 marks
2.	Community Health	200 marks
3.	Sociology And Behavioral Sciences	200 marks
	Total Marks	**600 Marks**

General Pathology and Microbiology

COURSE DESCRIPTION

General pathology and microbiology courses are offered as vital subject matter at undergraduate level programs to students who are engaged in medical studies. This subject deals with the diagnosis of diseases which is ultimately back bone of healthcare system. A good diagnosis leads to excellent treatment and prognosis. In general pathology portion, students learn about the abnormal functions of the body and with the investigation of those pathological mechanisms which are common to all tissue cell pathology. Students will be able to describe and demonstrate the processes of cellular adaptation, inflammation, repair, immunology, cellular accumulation, and neoplasia. While, microbiology course is designed to teach students about microorganism like bacteria, viruses, fungus and parasites. In this course. students will gain knowledge about the interaction of human body with these organisms and how these organisms cause diseases in humans. Students will get familiar with different techniques of microbiology which includes the identification and quantification of microorganisms that cause human disease (qualitative and quantitative analysis) which will provide diagnostic information for therapeutic support in the clinical management of patients. At the end of this course, students will be able to collect samples and process this sample according to microbiological protocols to generate microbiology report.

LEARNING OBJECTIVES

After completing this course, a student will be able to:

- Recognize the structural and functional causes of humandisease.
- Describe the aspects of a disease process that form the core of pathology
- Describe the cause of a disease (etiology)
- Describe the mechanisms of disease development (pathogenesis)
- Describe the structural, biochemical and molecular alterations induced in cells and tissues by the disease (morphologic ,molecular & biochemical changes)
- Describe the functional consequences of these changes (clinical significance)
- Describe the infectious diseases.

COURSE CONTENTS

i. GEN. PATHOLOGY

Cell Injury and Death: Causes of cell injury, Necrosis, Apoptosis and Sub cellular responses. Cell Adaptations: Hyperplasia, Hypertrophy, Atrophy, Metaplasia and Intracellular accumulation. Inflammation: Acute inflammation. Vascular events, Cellular events and Chemical mediators. Chronic Inflammation. General, Granulomatous and Morphologic patterns of acute and chronic inflammation. Healing and Repair:

Normal controls, Repair by connective tissue and Wound healing. Haemodynamic Disorders. Edema, Hyperemia / congestion, Hemorrhage, Thrombosis, Embolism, Infarction and Shock. Diseases of Immunity. General features, Hypersensitivity reactions, Immune deficiencies, Autoimmunity and Amyloidosis. Neoplasia: Nomenclature, Molecular basis, Carcinogenic agents and Clinical aspects

ii. MICROBIOLOGY

Basic Bacteriology

Bacteria Compared with Other Microorganisms, Structure of Bacterial Cells, Growth, Genetics, Classification of Medically Important Bacteria, Normal Flora, Pathogenesis,, Host Defenses, Laboratory Diagnosis, Antimicrobial Drugs: Mechanism of Action, Antimicrobial Drugs: Resistance, Bacterial Vaccines, Sterilization & Disinfection, Biosafety and bio risk management,

Clinical Bacteriology

Overview of the Major Pathogens & Introduction to Anaerobic Bacteria. **Gram-Positive Cocci;** *Staphylococcus aureus,Streptococcus pyogenes, Staphylococcus epidermidis, Staphylococcus saprophyticus, S. pyogenes, Streptococcus agalactiae, Enterococcus faecalis,* Viridansstreptococci, *Streptococcus bovi and S. pneumoniae*

Gram-Negative Cocci; *Neisseriameningitidis*and*Neisseria gonorrhoeae.*

Gram-Positive Rods;*Bacillusanthracis,Bacillus cereus, Clostridium tetani, Clostridium botulinum, Clostridium perfringens,Clostridiumdifficile, Corynebacteriumdiphtheriae*and*Listeria monocytogenes.*

Gram-Negative Rods Related to the Enteric Tract; *E. coli, Salmonella* species,*Shigella*species, *Vibrio cholerae, Vibrio parahaemolyticus,Vibriovulnificus, Campylobacter jejuni, Helicobacter pylori, Klebsiella, Enterobacter, Serratia, Proteus, Providencia, Morganella, Pseudomonas spp.,Bacteroides&Prevotella.*

Gram-Negative Rods Related to the Respiratory Tract;*Haemophilusinfluenzae, Bordetella pertussis*, and *Legionella pneumophila*

Gram-Negative Rods Related to Animal Sources (Zoonotic Organisms);*Brucella*species,*Francisellatularensis, Yersinia pestis*, and *Pasteurellamultocida*

Mycobacteria, Actinomycetes, Mycoplasmas, Spirochetes, Chlamydiae, Rickettsiae, Minor Bacterial Pathogens

Basic Virology

Structure, Replication, Genetics, Classification of Medically Important Viruses, Pathogenesis, Host Defenses, Laboratory Diagnosis, Viral Vaccines.

Clinical Virology

Herpes Viruses, Rabies Virus, Polio Virus, Hepatitis Viruses, Human Immunodeficiency Virus, Dengue Virus.

Mycology

Basic Mycology, Cutaneous & Subcutaneous Mycoses, Systemic Mycoses, Opportunistic Mycoses,

Parasitology

Intestinal & Urogenital Protozoa, Blood & Tissue Protozoa, Minor Protozoan Pathogens, Cestodes, Trematodes, Nematodes.

Sterilization

Laboratory Exercises:

Vetted

Each lecture will be followed by two hour practical class where the student will apply their theoretical knowledge in the understanding of related microbiological investigations, which have been proved useful for the diagnosis of human diseases.
During the other laboratory sessions, the students will be engaged in the preparation of media, the sterilization of glass ware, Antigens, Antibodies, Vaccines – haemolysin, permanent slides, laboratory reagents and also to assisting postgraduate students in the isolation of micro – organisms from clinical materials.

Practical

- Acute Inflammation
- Chronic Inflammation
- Necrosis
- Gangrene
- Pigmentation
- Calcification
- Urine Examination
- Sterilization
- Culture Media
- Antibiotic Sensitivity testing
- Culturing bacterial pathogens
- Examination of different clinical specimens
- Blood Culture
- Anaerobic Culture
- Gram Staining
- ZN Staining
- Biochemical tests to identify bacteria (Conventional, API 20E, API 20NE, Automated systems)
- PCR
- KOH preparation for scraping
- Stool Examination
- ELISA

RECOMMENDED BOOKS

1. Basic Pathology by Robbins Latest Edition
2. Clinical Pathology Interpretations by A.H. Nagi
3. Pocket Companion to Robbins, Pathologic basis of disease Cotran, Kumar
4. Theory and Practice of Histological Techniques by John D Bancrof

COMMUNITY HEALTH

COURSE DESCRIPTION

This course is designed to introduce the basic concepts of community health, including education, diversity, demography, and epidemiology as they apply to individuals in a given community over the life span. Students use, interpret, and analyze a variety of demographic and epidemiological information as they impact a given community.

LEARNING OBJECTIVES

After completing this course, a student will be able to:

- Develop an understanding of the theoretical foundations that inform the field of arts in medicine and practice of the arts in community health programs
- Understand the roles of the arts in promoting health education, health literacy and disease prevention in community settings
- Develop understanding of the knowledge and skills necessary to engage the arts in a health context
- Develop professional-level practical skills in using the arts to address health in both healthcare and community settings
- Achieve an advanced level of understanding of arts in public health practice
- Gain experience in and develop understanding of the administrative structures that support arts in public health programs and initiatives
- Understand core issues, contemporary trends, critical debates, and research central to the arts in public health
- Identify core competencies including ethical frameworks, program development and assessment, grant writing, and cultural competency.

COURSE CONTENTS

i. Community Health

Introduction; History of Community Medicine, Definition, concept of Health & illness of diseases and Natural History of diseases, levels & prevention

Environmental Sanitation & Medical Entomology; Water, waste disposal and Environmental problems & pollution

Genetics; Prevention of genetic diseases and Genetic counseling

General and Descriptive Epidemiology; Time, Place and Person

Analytical Epidemiology; Case control and Cohort studies

Experimental Epidemiology Randomized Control Trial.

Systemic Epidemiology; Vector borne diseases, Water borne diseases, Air born diseases, Contact diseases and Diseases of major public health and its importance along with national health programs wherever Applicable.

Non-Communicable Diseases; Diabetes, Hypertension, Heart diseases, Blindness, Accidents, Geriatric problems

Occupational Health Problems; M.C.H. and family welfare Programs, Health care delivery in the community, National Health Policy, National Health programs including, Rehabilitation, Evaluation of Health, Programs, Health Planning Organization,

Community Nutrition; Foundation and status in Pakistan masses. Community nutrition programs: key features, benefits, planning, implementation, evaluation. Nutritional status assessment: Anthropometric, Dietary, Biochemical, Clinical measurements. Community Nutrition and Dietetics profession. Steps of nutritional epidemiological study, Testing and Piloting of nutritional epidemiological study, Questionnaire design. Evaluation, sources of variation in the dietary intake, Methodological studies on dietary questionnaires.

Structure of Health Care System In The Country; P.H.C. district level, State level and central level. P.H.C. Organization and Function and Role of Non Governmental Organization

Health Education; Principles of Health Promotion, Methods, approaches and media for, I.E.C (Information, Education & Communication), Medical and Health/Information system, Mental Health and Nutrition.

Teaching Methodology; Types of health services, public, private, scientific, traditional health system, Organization of public services in health, central, provincial and local levels, Levels of health care, primary, secondary and tertiary, Planning and Organization of health services, Implementation, Evaluation of health services, Management of resources in health services, Financial management, Health education and social cultural concept Ethics in Health Services, Theories of learning facilitations.

Vetted

Incharge
Department of Allied Health Sciences
Sharqpur Medical College

PRIMARY HEALTH CARE (PHC)

Introduction and Philosophy of PHC & HFA
Principles of PHC
Essential components of PHC
Barriers in implementation of PHC
Organization of PHC Services in Pakistan-I
Introduction to MDG's and SDG's
Introduction to National Health Programmes

School Health

1. Objective of school health services
2. School health team
3. Duties of School medical officer
4. Duties of School health nurse
5. Medical inspection of school children
6. Common school health problems
7. Infectious diseases in schools
8. Healthy school environment
9. Role of teacher in school
10. School health services on Pakistan
11. Models of school health services
12. The Health Needs of School-Age Children
13. School health education program, Planning and implementation

Adolescent and Sexual Health

1. Welcome, introductions, course overview, ground rules, expectations
2. Empowerment, oppression, privilege, social justice
3. Anatomy&PhysiologySexualResponseCycleMenstrual Cycle, Conception, Contraception
4. Sexually Transmitted Infections
5. HIV/AIDS
6. Sexual Assault
7. Gender, Sexual Orientation, Heterosexism&Homophobia
8. Technology & Sexuality
9. Relationships & Communication
10. Body Image, Media & Sexuality

Health Planning

1. Importance and Significance of Planning
2. Understanding the Planning Concepts
3. Planning Models
4. Types of Plans
5. Planning Process
6. Planning Tools
7. Planning Commission of Pakistan
8. Role of ECNEC in Planning

Reproductive Health

1. Introduction to Reproductive Health and Life Cycle Approach
2. ICPD
3. Reproductive Behavior
4. Safe Motherhood
5. Breastfeeding
6. Contraception
7. STI's

8. Reproductive Health Rights
9. Gender Power and Reproductive Health
10. Infertility

Practical

Control of infections: Visit of TB Hospital/Clinic

Control of vector borne diseases: Instruments and techniques of insecticidal and larvicidal activities, Demonstration: Insects and parasites of medical significance

Collection of food samples and launching of prosecutions

Visits: (day trip)

Ice cream factories
Beverage manufacturing factories
Milk packing factories
Bakeries
Meat/ fish/ poultry/ vegetable markets
Slaughter houses, butcheries
Food selling stores
Hotels/restaurants
Water supply sources
Sewage treatment/disposal plants
Swimming pools
Cinema, schools
Airport, railway station, bus stands

Surveys and preparation of different documents.

Practical field work with demonstration on class room-based instructions.

1. Immunization- attachment EPI centers/ teams

Storage and administration of EPI vaccines.

Safe injection practice and disposal of injection wastes.

Supplementary vaccination activities.

Demonstration of cold chain system.

Preparation/ administration of ORS.

2. Visits: (day trip)

Basic health units

Rural health centres

Family planning units

RECOMMENDED BOOKS

1. Text book of Community Medicine by: Park J E. Latest Edition
2. Horton, Paul B. and Chester L. Hunt, 1984 Sociology, Singapore: Megraw Hill Book Co.
3. Moon, Graham, 1995. Society and Health; An introduction to Social Science for Processionals, London: Routledge.
4. Rehabilitation Research (Principles and Applications) 3rd Edition By Elizabeth Domholdt
5. Textbooks of Community Medicine, by Prof. H. A. Siddique (2nd Edition).
6. A Handbook of Behavioural Sciences for Medical and Dental Students By: M H Rana, S Ali and M Mustafa, , University of Health Sciences Lahore
7. Developmental Psychology for Healthcare Professions By: Katherine A Billingham
8. Principles of PHC. WHO
9. Strengthening PHC's in developing countries

10. PHC and MDG's. UNDP
11. Philosophy of PHC
12. WHR 2008

SOCIOLOGY AND BEHAVORIAL SCIENCES

COURSE DESCRIPTION

Psycho-social-cultural and political structures of society affect different spheres of public health, including the type and distribution of illness and disease. They also determine modes of intervention used in the prevention of illness, disease, and injury as well as the organization of health services at the national, international, and community levels. The goal of this course is to introduce the public health professionals to the various facets of the public health in light of the social determinants of health. The main emphasis is on a holistic view keeping under consideration the social, cultural, ecological, political and economic factors and their mutual interaction that influences the occurrence of disease and its management at individual and community level. By end of the course the participants should be able to explain key concepts in the social and behavioural aspects of public health: culture,race/ethnicity, gender, poverty/disparities, describe the factors related to behavior change, community, organizational climate andfamily structure, demonstrate understanding of the social determinants of health, describe how social determinants influence population health, critically assess the relevance of ethics in public health.

LEARNING OBJECTIVES

After completing this course, a student will be able to:

- Identify the socio-cultural aspects of health and illness, particularly as relating to the definitions of health, illness behavior and social epidemiology.
- Investigate the social causes of disease and illness related to disparities due to social stratification and unequal access.
- Describe the historical role of women in the medical system as patients, practitioners and health care providers.
- Differentiate the current ethical issues and debates about new medical technologies and their impact on doctor-patient relationships and on access to health care.

COURSE CONTENTS

Introduction of Sociology
Social Action And Interaction; Social processes, Co-operation, Competition, Conflict and Accommodation.
Social Groups; Primary-Secondary, In and Out Group and Reference group
Culture: Values, Beliefs, Sanctions, Cultural relativism and Ethnocentrism, Norms, Folk ways, Conflict. Deviancy and Social control.
Socialization and Personality formation
Social Institution; Meanings, Social stratification and Meanings and Forms (Classes and Castes)
Social and Cultural Change; Factors promoting and resisting social change
The Field Of Medical Sociology; Contribution of Sociology in Health. Environmental pollution and Health. Patient, Healthcare provider relationship. Role of Healthcare provider and attendants in the managements of patient.
Introduction of Behavioural Sciences; Understanding Behaviour. Sensation, sense organs / special organs, Perception and factors affecting it, Attention, concentration, Memory, types and methods to improve it, Types and theories of thinking, Cognition and levels of cognition, Problem solving and decision making strategies, Communication Its types.

Personality and Intelligence; Psychological growth and development, Personality, theories and Factors affecting personality development, Assessment of personality Influence of personality in health, disease, hospitalization, stress, etc, Intelligence and its types Relevance of IQ and EQ Methods of enhancing EQ and IQ Factors affecting intelligence and their assessment
Stress Management
Doctor – Patient Relationship; Concept of boundaries and psychological reactions in doctor – patient relationship.
Pain, Sleep and Consciousness; Concept of pain, sleep and consciousness, Attend states of consciousness, Psychological influence on sleep and consciousness, Non-pharmacological methods of inducing sleep, Changes in consciousness.
Communication Skills; Principles of effective communication. A practical method of communication between the doctor and patient about disease, drugs, prognosis etc
Interviewing; Types of interview and Skills of interviewing
Health Psychology
Psychology in clinical management of patients, Psychological therapies, child's social and cognitive development, Psychological changes during adolescence, old age and their clinical management, Impact of illness on a patient's psychological well being. Association between psychological stress and physical well being, Role of doctor in patient reassurance.
Social And Community Perspective; Inequalities Ethnicity, culture and racism, Gender and Healthcare and Influence of health. Illness on behaviour
Application of Behavioural Principles In Health and Disease; Mentally / emotionally and physically handicapped, Homebound and medically compromised.

Practical

Observation of different personality types, assessment of different personalities, and preparation of different documents.
Visits: (day trip)
Ice cream factories
Beverage manufacturing factories
Milk packing factories
Bakeries
Meat/ fish/ poultry/ vegetable markets
Slaughter houses, butcheries
Food selling store
Hotels/restaurants
Water supply sources
Sewage treatment/disposal plants
Swimming pools
Cinema, schools
Airport, railway station, bus stands

RECOMMENDED BOOKS

1. Text book of Community Medicine by: Park J E. Latest Edition
2. Horton, Paul B. and Chester L. Hunt, 1984 Sociology, Singapore: Megraw Hill Book Co.
3. Moon, Graham, 1995. Society and Health; An introduction to Social Science for Processionals, London: Routledge.
4. Rehabilitation Research (Principles and Applications) 3rd Edition By Elizabeth Domholdt
5. Textbooks of Community Medicine, by Prof. H. A. Siddique (2nd Edition).
6. A Handbook of Behavioural Sciences for Medical and Dental Students By: M H Rana, S Ali and M Mustafa, , University of Health Sciences Lahore
7. Developmental Psychology for Healthcare Professions By: Katherine A Billingham

Vetted

Incharge
Department of Allied Health Sciences
Sargodha Medical College
University of Sargodha

4th Year

1. SCIENTIFIC INQUIRY, BIOSTATISTICS, RESEARCH METHODOLOGY 100 Marks
2. EPIDEMIOLOGY 200 Marks
3. PUBLIC HEALTH MANAGEMENT 200 Marks
   Report Writing Qualifying

Total Marks 500 Marks

SCIENTIFIC INQUIRY, BIOSTATISTICS, RESEARCH METHODOLOGY

COURSE DESCRIPTION

This course includes discussion on basic quantitative methods and designs, including concepts of reliability and validity, interpretation of inferential statistics related to research designs, co relational statistic & designs, interclass correlation coefficients, and critical appraisal of the literature. It involves selection of appropriate statistical techniques to address questions of medical relevance; select and apply appropriate statistical techniques for managing common types of medical data; use various software packages for statistical analysis and data management; interpret the results of statistical analyses and critically evaluate the use of statistics in the medical literature; communicate effectively with statisticians and the wider medical community, in writing and orally through presentation of results of statistical analyses; explore current and anticipated developments in medical statistics

LEARNING OBJECTIVE

- Identify the basic concepts of research and scientific inquiry and its methodologies
- Identify appropriate research topics
- Define appropriate research problem and parameters
- Construct a project proposal to undertake a research project.
- Discuss scientific Inquiry, its principle and application in medical research.
- Describe Search techniques for literature review
- Differentiate between different levels of evidence, appraisal and different studies with respect to their effectiveness in literature.
- Discuss necessary concepts of statistics to enable them to realize a research project in the field of Physiotherapy
- Explain Fundamentals of reading and understanding research methods, design, and statistics

i. SCIENTIFIC INQUIRY

- Describe scientific inquiry, Evidence based approach to scientific inquiry, Principles of scientific inquiry, the application of scientific inquiry to physical therapy.
- Access digital libraries and different research databases, Effective searching and reviewing literature material.
- Interpret Critical appraisal of published research in the areas of Examination and Evaluation, Diagnosis, Prognosis, Intervention
- Interpret Critical evaluation of Randomized Control Trial (RCT), Systemic review, Diagnosis and screening tests, Case reports
- Discuss how to conduct clinical research and hierarchy of evidences in clinical researches

ii. BIOSTATISTICS

- Define Statistics, Population, sample Descriptive and inferential Statistics, Observations, Data, Discrete and continuous variables, Errors of measurement, Significant digits, Rounding of a Number. Collection of primary and secondary data, Sources, Editing of Data. Exercises.

Vetted

PRESENTATION OF DATA

• Introduction, basic principles of classification and Tabulation, Constructing of a frequency distribution, Relative and Cumulative frequency distribution, Diagrams, Graphs and their Construction, Bar charts, Pie chart, Histogram, Frequency polygon and Frequency curve, Cumulative Frequency Polygon or Ogive, Historigram, Ogive for Discrete Variable. Types of frequency curves. Exercises.

MEASURES OF CENTRAL TENDENCY

• Explain Different types of Averages, Quantiles, The Mode, Empirical Relation between Mean, Median and mode, Relative Merits and Demerits of various Averages. Properties of Good Average, Box and Whisker Plot, Stem and Leaf Display, definition of outliers and their detection. Exercises.

MEASURES OF DISPERSION

• Describe Absolute and relative measures, Range, The semi-Inter-quartile Range, The Mean Deviation, The Variance and standard deviation, Change of origin and scale, Interpretation of the standard Deviation, Coefficient of variation, Properties of variance and standard Deviation, Standardized variables, Moments and Moments ratios. Exercises.

PROBABILITY AND PROBABILITY DISTRIBUTIONS

• Define Discrete And Continuous Distributions: Binomial, Poisson And Normal Distribution. Exercises.

SAMPLING AND SAMPLING DISTRIBUTIONS

• Describe sample design and sampling frame, bias, sampling and non-sampling errors, sampling with and without replacement, probability and non-probability sampling, Sampling distributions for single mean and proportion, Difference of means and proportions. Exercises.

iii. Research Methodology

Research Fundamentals; Research, Theory in Research, Research Ethics

Research Design; Research Problems, Questions, and Hypotheses, Research Paradigms, Design Overview and Research Validity

Experimental Designs; Group Designs and Single-System Design

Non Experimental Research; Overview of Non experimental Research, Clinical Case Reports, Qualitative Research, Epidemiology, Outcomes Research and Survey Research.

Measurement; Measurement Theory and Methodological Research.

Data Analysis; Statistical Reasoning, Statistical Analysis of Differences; The basics, Statistical Analysis of Differences; Advanced and special Techniques, Statistical Analysis of Relationships; The basics and Statistical Analysis of Relationships; Advanced and special Techniques

Implementing Research; Implementing a Research Project and Publishing and Presenting Research

RECOMMENDED BOOKS

1. Essentials of clinical research By Stephan P. Glasser.
2. Rehabilitation Research (Principles and Applications) 3rd Edition By Elizabeth Domholdt.
3. Walpole RE. Students study guide: introduction to statistics. 3rd ed. 1982.
4. Muhammad F. Statistical methods and data analysis. Faisalabad: KitabMarkaz; 2000
5. R. L Ott, Micheal T longnecker. An introduction to statistical methods and data analysis, 7th ed.
6. Brooks/Cole, Cengage Learning 2015

EPIDEMIOLOGY

COURSE DESCRIPTION

Epidemiology is an essential discipline for public health practice. The importance of this science is demonstrated by the inclusion of epidemiology courses in most medical, nursing and public health curricula. Basic Epidemiology lays stress on the basic epidemiological principles and their application to research methodology developing on the understanding of the fundamental principles

and on the development of the practical skills and concepts rather than on mathematical calculations. In Biological sciences, sometimes the complexity of data collected is such that there is very little choice left for the researcher to conduct simple analyses and assure the reader about the authenticity of the data and the conclusions that are drawn. However, applications of some advanced techniques to the complex data can be useful to learn and interpret supporting the conclusions. This course is designed to answer the basic and complex questions that a researcher raises. This will also enable the students to further their research for a higher degree.

LEARNING OBJECTIVES

After completing this course, a student will be able to:

- Understand the concept of Epidemiology, Epidemiological Studies and its application and uses in controlling Public Health problems
- Explain and practice some key techniques in epidemiology
- Understand some routine methods of data analysis
- Apply these techniques in a practical sense
- Understand Natural History of disease
- List common infectious disease of public health importance
- Describe the global and national impact of common communicable diseases
- Discuss the strategies of control of common Communicable Diseases in Pakistan
- Understand the importance of Non Communicable Diseases in Pakistan
- The awareness of the preventive strategies for Non Communicable Diseases
- Develop the health promotion strategies for Non Communicable Diseases
- Define and prevent injury, accidents and their types

COURSE CONTENTS

1. Basic Epidemiology

1. Introduction to Epidemiology
2. Measures of Disease Frequency: Prevalence and Incidence
3. Measures of Mortality
4. Descriptive Study Designs
5. Analytical Study Designs
6. Measures of Association
7. Criteria for Causation

2. Communicable Disease Epidemiology

1. Disease Spread Through Respiratory Tract
2. GIT Infections
3. Vector-Borne Diseases
4. Zoonotic Diseases
5. Contagious Diseases
6. Surface Infections
7. Sexually Transmitted Infections
8. Emerging and Re-emerging Diseases

3. Non Communicable Disease Epidemiology

1. Hypertension
2. Coronary Heart Diseases
3. Stroke
4. Cancers
5. Blindness
6. Diabetes Mellitus
7. Obesity
8. Injuries and Accidents

Vetted

Department of

Practical

Surveys and preparation of different documents.
1. Control of infections: Visit of TB Hospital/Clinic
2. Control of vector borne diseases: Instruments and techniques of insecticidal and larvicidal activities,
Demonstration: Insects and parasites of medical significance
Collection of food samples and launching of prosecutions

RECOMMENDED BOOKS

1. R. Beaglehole, R. Bonita, T.KjellstromBasic epidemiology AITBS India
2. Leon GordisEpidemiology W.B. Saunders co.
3. Mausner JK , BAHN AK Epidemiology: An Introductory Text 3rd W.B. Saunders co.
4. Chanawongse K. Understanding primary health care management: from theory to practical reality. Bangkok: Buraphasilp Press; 1990.
5. Dicker RC, et. al. Principles of epidemiology: an introduction to applied epidemiology and biostatistics, 2nded. Atlanta, GA, USA: Centers for Disease Control and Prevention, 1992.
6. Ministry of Health, Government of Pakistan, World Health Organization, Heartfile. National action plan for prevention and control of non-communicable diseases and health promotion in Pakistan: a public-private partnership in health. Islamabad, Pakistan: tripartite collaboration of the Ministry of Health, Government ofPakistan; WHO, Pakistan office, and Heartfile; 2004.
7. Ilene Moroflubkin, with Pamala D. Larsen Chronic Illness 4th Jones &Bortlett Publishers
8. R. Beaglehole, R. Bonita, T.KjellstromBasic epidemiology AITBS India
9. Leon Gordis Epidemiology W.B. Saunders co.
10. Mausner JK , BAHN AK Epidemiology: An Introductory Text3rd W.B. Saunders Co.
11. Pagano, Gauvreau Principles of Biostatistics 2nd Thomson
12. Rosner Fundamentals of Biostatistics 6th Thomson
13. Daniel WW Biostatistics: A Foundation for analysis in Health Sciences 5th(1990) John Willey and Sons.

PUBLIC HEALTH MANAGEMENT

COURSE DESCRIPTION

Pakistan has one of the best knitted network health care facilities in public sector. These facilities mostly, face the problems of underutilization and under functioning along with the technical and allocative inefficiency. The management of private sector has also been considered inefficient and not very effective. Specific Management tools and techniques, such as strategic management, management by objectives, quality assurance methods, monitoring and evaluation of the health systems outputs and outcomes, and economic appraisal are not practiced. Insufficient management knowledge, in appropriate attitude and skills are reducing the capacity to improve the system.The overall goal of the course is to enable the participants to describe the principal concerns in Health Systems management in order to improve the management capacity of health managers in terms of their knowledge, attitude and skills.

LEARNING OBJECTIVES

After completing this course, a student will be able to:

- Identify the challenges confronting health care organizations in the context of managing their human resources;
- Understand the role of health care professionals in the human resources management function of health care organizations;

Vetted

Incharge
Department of Allied Health Sciences
Sargodha Medical College
University of Sargodha

- Construct effective human resources policies for the effective management of people in health care organizations;
- Discuss the impact of legal considerations on key human resources management activities and functions;
- Explain the changing nature of jobs and how jobs in health care settings are being redesigned to enhance productivity and patient care quality;
- Identify strategies for dealing with shortages or surpluses of human resources;
- Discuss the strategic importance of the recruitment and selection function in health care organizations;
- Explain the role of employee training and development and its contribution to the mission of the health care organization;
- Understand the business case for diversity and inclusion in health care organizations;
- Describe the characteristics of an effective performance management system;
- Discuss the role of compensation and benefits management for rewarding and motivating health care employees;
- Summarize the relationship between health and safety issues and human resources management; and
- Describe the strategic importance of employee relations practices

COURSE CONTENTS

1. Health Policy and Management

1. Introduction to Health Management
2. Strategic Management
3. Planning
4. Organization
5. Monitoring
6. Evaluation
7. Pakistan Health Policy
8. Health Financing
9. Stewardship
10. History of Health Policy in Pakistan
11. Determinants of health policy

2. Health Planning

1. Importance and Significance of Planning
2. Understanding the Planning Concepts
3. Planning Models
4. Types of Plans
5. Planning Process
6. Planning Tools
7. Planning Commission of Pakistan
8. Role of ECNEC in Planning

3. Hospital Management

1. Role of hospital in Health care
2. Hospital planning and design
3. Outpatient services
4. Nursing services
5. Introduction, roles and functions of ICU
6. Medical records
7. Material management; Waste management, disposal of hospital waste, Types and general classification of hospital wastes

4. District Health Management

1. Introduction to Healthcare Care Delivery System In Pakistan {Public and Private Sector}
2. Organization of Health Care System in a District

Vetted

3. Healthcare Services Delivered at Different Tiers of District Health Management Services.{Minimum Service Delivery Standards}
4. Health Information System at District Level.
5. Organization and Functioning of Dispensary, MCHC, BHU, RHC, THQ, DHQ,
6. Referral Chain of Patient from BHU to DHQ and onwards
7. Duties of Different Health Care Providers Employed in District Health Management.
8. Role of District administration in district health management
9. Nazim and its part in district health management

5. Health Inventory Management

1. Introduction to Inventory Management
2. The Financial Implications of Holding Inventory: Inventory Carrying Cost, Effect on Financial
3. The Cost of not holding enough Inventory
4. Introduction to Effective Inventory Management
5. Inventory Management & the Supply Chain Strategy
6. Demand Forecasting
7. Lead time Management
8. Introduction to Inventory Planning
9. Inventory Categorization Techniques: ABC Analysis, Fast & Slow Moving, Excess, Obsolete & Defective Stocks
10. Traceability and Variety Reduction
11. Inventory Coding Systems and bin card management
12. The Inventory Management Plan
13. Introduction to Inventory Operations
14. Monitoring Movements: Inventory Accuracy
15. Measuring and Valuation of Inventory
16. Receipt & Issuance of Inventory
17. Systems to Replenish Inventory
18. Order planning (time, value & quantity)
19. Storage of vaccines and perishable items
20. Inventory management of disposables

6. Disaster Management

1. Concept of Disaster
2. Types of Disaster
3. Effect of Disaster on Health
4. Elements at Risk in Disaster
5. Disaster Management Cycle
6. Role of Public Health in Disaster
7. Role of NDMA in Managing Disaster
8. Health Education for Disaster Safety
9. Public Health Review
10. Interdisciplinary Disaster Planning
11. Community Level Preparedness
12. Disaster Mitigation and Post-Event Response
13. Risk Communications
14. Environmental Health Degradation
15. Mental Health Challenges of a Disaster
16. Monitoring and Evaluation of Recovery Efforts

7. Quality Management in Health care

1. Introduction to Quality Management in Health
2. Evolution of Quality and its Standards
3. Quality Healthcare
4. Characteristics of Quality
5. Dimensions of Quality

Vetted

6. Quality Principles
7. Quality Cycle & Circle
8. Quality Audit of Healthcare Services

Practical

Surveys and supervised field visits to Private and Public Hospitals
Sheds, fodder and water storage areas and watering places for cattle's
Places for storage of grain and other food items for human consumption.
Conduct rate proofing.
Learn about solid waste management.
Demonstrations:
Sanitary requirements in respect of slaughter houses and animal handlers
Inspection slaughtered meat at slaughter houses.
Birth and death registration at office of union council.
Execute proper hand washing technique.
Inspection for personal hygiene.
Examine ventilation of different types of building.
Collect water sample from taps, wells and canals.
Examine temperature (heat and cold), noise, indoor air quality and lighting at work places.
Inspect and chlorinate wells.

RECOMMENDED BOOKS

1. Chanawongse K. Understanding primary health care management: from theory to practical reality. Bangkok: Buraphasilp Press; 1990.
2. Gourlay R. Training manual on health manpower management (8 volumes). Geneva: Division of Health Manpower Development, World Health Organization; 1988. Document no. WHO/EDUC/88.195.
3. Willson Quality gurus in Health
4. Heizer& Nathan Total Quality Management, Manufacturing and Services
5. Narayan Disaster Management APH
6. Green A. An introduction to health planning in developing countries, 2nd edition. Oxford: Oxford University Press; 1999.
7. Kielmann, AA, Janovsky K, Annett H. Assessing district health needs, services and systems: protocols for rapid data collection and analysis. London, UK: Macmillan Education Ltd and AMREF, 1995.
8. Green A. An Introduction to Health Planning in developing countries. ELBS London
9. Manual of Epidemiology for District Health Management. J. P. Vaughan, R. H. Morrow World Health Organization, 01-Jan-1989Medical198 page
10. Nabeela Ali. District Health Management Team. PAIMAN. Contech International Health Consultants
11. Essentials of Inventory Management, by Max Muller (Basic Inventory Control)

RESEARCH REPORT WRITING

In the final year, a project will be allocated to a single or group of students, depending on available facilities. The In-charge / chairperson of the concerned department/institute shall allot a supervisor. This report shall be evaluated by a panel of examiners notified by the office of the controller examination from an approved panel comprising external and internal examiners. Every student shall be evaluated keeping in view their contribution, thorough understanding of work done and comprehensive presentation. If the student cannot defend his/her work in 1st annual examination, they shall reappear in the 2nd annual/supplementary examination. The details of the report are given below

- Title page
- Names of students
- Students I.D number

Vetted
Department of Allied Health Sciences