SECOND SEMESTER

1. **ANATOMY -II**
2. **PHYSIOLOGY-II**
3. **KINESIOLOGY-II**
4. **ENGLISH-II (FUNCTIONAL ENGLISH)**
5. **ISLAMIC STUDIES/ETHICS**
6. **BIOSTATISTICS-II/UNIVERSITY OPTIONAL**

ANATOMY- II

CREDIT HOURS 4 (3-1)

COURSE DESCRIPTION:

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed upon structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, musculoskeletal and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models, prosecuted materials and radiographs are utilized to identify anatomical landmarks and configurations of the lower limb and abdomen pelvis.

COURSE OUTLINE:

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)
- Muscles of lower leg and foot.

NEUROLOGY:

- Course, distribution, supply of all nerves of lower limb and gluteal region
- 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
- Surface marking of lower limb

ABDOMEN

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
- Nerves of perineum

GENERAL HISTOLOGY:

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

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 the respective semester /year

RECOMMENDED TEXT 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.

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. *Neuroanatomy* by Richard S. Snell.

PHYSIOLOGY- II

CREDIT HOURS 3 (2-1)

COURSE DESCRIPTION:

The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels. The major underlying themes are: the mechanisms for promoting homeostasis; cellular processes of metabolism, membrane function and cellular signaling; the mechanisms that match supply of nutrients to tissue demands at different activity levels; the mechanisms that match the rate of excretion of waste products to their rate of production; the mechanisms that defend the body against injury and promote healing.

These topics are addressed by a consideration of nervous and endocrine regulation of the cardiovascular, hematopoietic, pulmonary, renal, gastrointestinal, and musculoskeletal systems including the control of cellular metabolism. The integrative nature of physiological responses in normal function and disease is stressed throughout the course.
This course will sever as pre requisite for the further courses i.e. exercise physiology, pathology, etc.

COURSE OUTLINE:

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

1. Clinical importance of lung function tests
2. Causes of abnormal ventilation and perfusion
3. Effects on pneumothoax, pleural effusion, and pneumonia
4. Respiratory failure
5. Artificial respiration and uses & effects of O^2 therapy
6. Clinical significance of hypoxia, cyanosis, and dyspnoea

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
- Endocrine & exocrine pancreas and functions of pancreas in digestion.

Clinical Module

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

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

1. Anemia and its different types
2. Blood indices in various disorders
3. Clotting disorders
4. Blood grouping and cross matching
5. Immunity

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
- The endocrine functions of the kidney and Physiology of growth.

Clinical Module

1. Acromegaly, gigantism and dwarfism
2. Effects of panhypopitutiarism
3. Diabetes insipidus
4. Thyrotoxicosis and myxoedema
5. Pheochromocytoma
6. Cushing's disease
7. Adrenogenital syndrome
8. Diabetes mellitus and hypoglycaemila.

PRACTICALS:

HAEMATOLOGY:

- Use of the microscope
- Determination of haemoglobin
- Determination of erythrocyte sedimentation rate
- Determining packed cell volume
- Measuring bleeding and clotting time
- 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.

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.

KINESIOLOGY-II

CREDIT HOURS 3 (2-1)

COURSE DESCRIPTION:

This course covers the definition of kinesiology and its importance to physical therapy and identifies the scope of kinesiology studies and their application. It also covers the types of human motions and their planes of motions and its relative axes explain the inter-relationship among kinematic variables, and utilize the knowledge of this inter-relationship to describe and analyze motion. This course also covers the classification of the joints or muscles and their characteristics distinguishing arthrokinematic movements from osteokinematic movements and explain their relationship and the difference among agonists, antagonists, and synergists integrate the knowledge learned with human motion occurring during daily activities.

COURSE OUTLINE:

RANGE OF MOTION

Active Movements

Voluntary movements

- Definition
- Classification

Free Exercises

- Classification of free exercises
- Techniques of free exercises
- Effects and uses

Assisted Exercises

- The principles of assistance

- Techniques
- Effects and uses

Assisted Resisted Exercises

Resisted Exercises

- The principles of resistance
- Variation of the power of the muscles in different parts of their range
- Techniques of resisted exercises
- Resistances
- Progressive resistance exercise
- Progression
- Effects and uses of resisted exercises

Involuntary Movement

- Reflex movement
- The reflex arc
- The stretch reflex
- The righting reflexes
- The postural reflexes
- Effects and uses of reflex movement

PASSIVE MOVEMENT:

- Classification
- Specific definitions
- Relaxed passive movements
- Principles of giving relaxed passive movements & its Effects and uses
- Accessory movements
- Principles of giving accessory movements and its Effects and uses
- Passive manual mobilization and manipulations
- Principles and Effects and uses
- Controlled sustained stretching, Principles and Effects and uses

RELAXATION:

- Definition
- Muscle tone
- Postural tone
- Voluntary movement
- Mental attitudes
- Degrees of relaxation
- Pathological tension in the muscles
- Technique
- General relaxation
- Local relaxation

DERIVED POSITIONS:

- Purpose of derived positions

- Positions derived from standing By: alteration of arms, alteration of the legs, alteration of trunk & alteration of legs and trunk
- Positions derived from kneeling
- Positions derived from sitting By: alteration of the legs& by alteration of trunk
- Positions derived from lying , By alteration of arms and by alteration of the legs
- Positions derived from hanging
- Other positions in which some of the weight is taken on the arms

SUSPENSION THERAPY:

- Suspension application
- Suspension concept of inclined planes
- The fixed point suspension
- Supporting rope and its types
- Sling and its types
- Type of suspension: axial &vertical
- Methods, techniques of suspension: upper limb & lower limb
- Suspension effect on muscle work and joint mobility.

NEUROMUSCULAR CO-ORDINATION:

- Coordinated movement
- Group action of muscles
- Nervous control
- Inco-ordination
- Re-Education
- Frenkel's exercises.

WALKING AIDS:

- Crutches
- Sticks
- Tripod or Quadra pod
- Frames

PRACTICAL TRAINING/ LAB WORK:

- Practical demonstrations of the techniques of active, passive movements
- Manual muscle testing
- Practical demonstrations of relaxation procedures
- Practical demonstrations of various derived positions.

GONIOMETRY:

- Introduction to Goniometry
- Basic concepts in Goniometry
- Joint motion

- Range of motion
- Factors affecting ROM
- End-feel
- Capsular and non capsular pattern of ROM limitation
- Procedures
- Positioning
- Stabilization
- Measurements Instruments
- Alignment
- Recording
- Procedures
- Validity and Reliability
- Reliability Studies
- Mathematical methods of evaluation measurement reliability
- Exercise to evaluate reliability
- Measurement of upper extremity
- Measurement of lower extremity
- Measurement of tempomendibular joint
- Measurement of the cervical spine
- Measurement of the thoracic spine
- Measurement of the lumber joint
- Average range of motion
- Joint measurement by body position.

ENGLISH II (FUNCTIONAL ENGLISH)

CREDIT HOURS 3(3-0)

Objectives:

Enable the students to meet their real life communication needs.

COURSE CONTENTS:

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
Academic skills
Letter/memo writing, minutes of meetings, use of library and internet
Presentation skills

Personality development (emphasis on content, style and pronunciation)
Note: documentaries to be shown for discussion and review

RECOMMENDED BOOKS:

Communication Skills

Grammar

1. Practical English Grammar by A. J. Thomson and A. V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 431350 6.

Writing

1. Writing. Intermediate by Marie-Chrisitine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 019 435405 7 Pages 45-53 (note taking).
2. 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).

Reading

1. Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 453403 0.
2. Reading and Study Skills by John Langan
3. Study Skills by Riachard Yorky.

ISLAMIC STUDIES (COMPULSORY)

CREDIT HOURS 2 (2-0)

Objectives:

This course is aimed at:

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

DETAIL OF COURSES:

Introduction to Quranic Studies

- Basic Concepts of Quran
- History of Quran
- Uloom-ul –Quran.

Study of Selected Text of Holly Quran

- Verses of Surah Al-Baqra Related to Faith (Verse No-284-286)
- Verses of Surah Al-Hujrat Related to Adab Al-Nabi (Verse No-1-18)

- Verses of Surah Al-Mumanoon Related to Characteristics of faithful (Verse No-1-11)
- Verses of Surah al-Furqan Related to Social Ethics (Verse No.63-77)
- Verses of Surah Al-Inam Related to Ihkam (Verse No-152-154).

Study of Selected Text of Holly Quran

- Verses of Surah Al-Ihzab Related to Adab al-Nabi (Verse No.6,21,40,56,57,58.)
- Verses of Surah Al-Hashar (18,19,20) Related to thinking, Day of Judgment
- Verses of Surah Al-Saf Related to Tafakar,Tadabar (Verse No-1,14).

Seerat of Holy Prophet (S.A.W) I

- Life of Muhammad Bin Abdullah (Before Prophet Hood)
- Life of Holy Prophet (S.A.W) in Makkah
- Important Lessons Derived from the life of Holy Prophet in Makkah.

Seerat of Holy Prophet (S.A.W) II

- Life of Holy Prophet (S.A.W) in Madina
- Important Events of Life Holy Prophet in Madina
- Important Lessons Derived from the life of Holy Prophet in Madina.

Introduction To Sunnah

- Basic Concepts of Hadith
- History of Hadith
- Kinds of Hadith
- Uloom –ul-Hadith
- Sunnah & Hadith
- Legal Position of Sunnah.

Selected Study from Text of Hadith

Introduction To Islamic Law & Jurisprudence

- Basic Concepts of Islamic Law & Jurisprudence
- History & Importance of Islamic Law & Jurisprudence
- Sources of Islamic Law & Jurisprudence
- Nature of Differences in Islamic Law
- Islam and Sectarianism.

Islamic Culture & Civilization

- Basic Concepts of Islamic Culture & Civilization
- Historical Development of Islamic Culture & Civilization
- Characteristics of Islamic Culture & Civilization
- Islamic Culture & Civilization and Contemporary Issues.

Islam & Science

- Basic Concepts of Islam & Science

- Contributions of Muslims in the Development of Science
- Quranic & Science.

Islamic Economic System

- Basic Concepts of Islamic Economic System
- Means of Distribution of wealth in Islamic Economics
- Islamic Concept of Riba
- Islamic Ways of Trade & Commerce.

Political System of Islam

- Basic Concepts of Islamic Political System
- Islamic Concept of Sovereignty
- Basic Institutions of Govt. in Islam.

Islamic History

- Period of Khlaft-E-Rashida
- Period of Ummayyads
- Period of Abbasids

Social System of Islam

- Basic Concepts of Social System of Islam
- Elements of Family
- Ethical Values of Islam.

RECOMMENDED TEXT BOOKS:

1. Hameed ullah Muhammad, “Emergence of Islam” , IRI, Islamabad
2. Hameed ullah Muhammad, “Muslim Conduct of State”
3. Hameed ullah Muhammad, ‘Introduction to Islam
4. Mulana Muhammad Yousaf Islahi,”
5. Hussain Hamid Hassan, “An Introduction to the Study of Islamic Law” leaf Publication Islamabad, Pakistan.
6. Ahmad Hasan, “Principles of Islamic Jurisprudence” Islamic Research Institute, International Islamic University, Islamabad (1993)
7. Mir Waliullah, “Muslim Jrisprudence and the Quranic Law of Crimes” Islamic Book Service (1982)
8. H. S. Bhatia, “Studies in Islamic Law, Religion and Society” Deep & Deep Publications, New Delhi (1989)
9. Dr. Muhammad Zia-ul-Haq, “Introduction to Al Sharia Al Islamia” Allama Iqbal Open University, Islamabad (2001).

BIOSTATISTICS – II
CREDIT HOURS 3 (3-0)

COURSE DESCRIPTION:
To provide the students with the necessary concepts of statistics to enable them to realize a research project in the field of Physiotherapy. 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. It is designed to teach entry-level physical therapy students the fundamentals of reading and understanding research methods, design, and statistics.

COURSE OUTLINE:

HYPOTHESIS TESTING:
Introduction, Statistical problem, null and alternative hypothesis, Type-I and Type-II errors, level of significance, Test statistics, acceptance and rejection regions, general procedure for testing of hypothesis. Exercises.

TESTING OF HYPOTHESIS- SINGLE POPULATION:
Introduction, testing of hypothesis and confidence interval about the population mean and proportion for small and large samples, Exercises.

TESTING OF HYPOTHESES-TWO OR MORE POPULATIONS:
Introduction, Testing of hypothesis and confidence intervals about the difference of population means and proportions for small and large samples, Analysis of Variance and ANOVA Table. Exercises.

TESTING OF HYPOTHESIS-INDEPENDENCE OF ATTRIBUTES:
Introduction, Contingency Tables, Testing of hypothesis about the Independence of attributes. Exercises.

REGRESSION AND CORRELATION:
Introduction, cause and effect relationships, examples, simple linear regression, estimation of parameters and their interpretation. r and R^2. Correlation. Coefficient of linear correlation, its estimation and interpretation. Multiple regression and interpretation of its parameters. Examples,

RECOMMENDED TEXT BOOKS:

1. Walpole, R. E. 1982. “Introduction to Statistics”, 3rd Ed., Macmillan Publishing Co., Inc. New York. Muhammad, F. 2005.
2. “Statistical Methods and Data Analysis”, Kitab Markaz, Bhawana Bazar Faisalabad.