



Syllabus for Written Examination

Post: **Assistant Professor/Lecturer**

Subject: **Anatomy and Physiology (ALP)** (major: MD Physiology/MS Anatomy/MSc. Anatomy/Master in Medicine)

1. The knowledge of the related subject matters which are generally included in the concerned bachelor and master level courses

Comprehensive concept on structure, functions, and mechanisms of different organ systems of human body with examples of diseases illustrating important physiological principles.

- (a) Introduction to Anatomy and General Physiology: Anatomical position and plane, basic life process. Homeostasis, transport through the cell membrane.
- (b) Basic concept of cellular anatomy and physiology with clinical correlation
- (c) Nervous system: Physiological anatomy, organization, functions, neurophysiology (RMP, AP), synaptic transmission, higher functions, special senses, pathways, and clinical correlation.
- (d) Musculoskeletal System: Physiological anatomy, organization, functions, mechanism of muscle contraction, reflexes, movement, and clinical correlation.
- (e) Respiratory System: Organization, structure, functions, mechanism of all the steps of respiration, regulation of respiration, and clinical connection.
- (f) Cardiovascular system, Blood & Lymphatic: Organization, structure, and functions, electrical and mechanical events of heart, dynamics of blood and lymph, integrated control of CVS and clinical correlation
- (g) Digestive system: Overview of gastrointestinal structure, functions, and regulation, and clinical connection
- (h) Renal system: Organization, structure, and functions of each element of the system, regulation of volume, osmolality and pH of ECF, clinical connection.
- (i) Endocrine/Reproductive: Organization, structure, and functions of each element of systems, regulation, and mechanism of action of major hormones, hypo and hyper-secretions, Gonads: functional anatomy, the hormonal function of male and female reproductive physiology, clinical connection.
- (j) Extreme Physiology: High altitude, space, sport, and marine physiology.

2. Basic Knowledge and trends in anatomy and physiology and molecular medicine

- (a) Current avenues and future scope of Human Anatomy & Physiology on understanding medicine
- (b) Correlation of recent novel diseases with the anatomical and physiological basis on exploring the pathophysiology.
- (c) APL as clinically relevant as the foundation of scientific medical practice and immediate bedside applicability.
- (d) APL as experimental scientific discipline.
- (e) Principle, standard and ethical issues for the animal experimental procedure in experimental physiology

- (f) Molecular Diagnostic Technique: Polymerase chain reaction (Principle, advantage and disadvantages), In-situ hybridization (Principle, advantage and disadvantages).
- (g) Gene therapy: Introduction to gene therapy, working principle, Ethical issues about gene therapy and genome editing.
- (h) Other medical advances: Cell-based gene therapy, RNA therapy, mRNA vaccines

3. National and global trends and Issues regarding the Human APL and Pharmaceutical Education

4. Teaching and research methodology:

Medical pedagogical skills, conceptualization on exploring lacuna in medical research and establishing research topics, medical and pharmaceutical research proposal design and scientific writing, project development, and research ethics.