



Syllabus for Written Examination

(For Special Internal Competition)

Post: **Assistant Professor/Lecturer**

Subject: **Anatomy and Physiology** (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 (60%)

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
- (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.

2. Basic Knowledge of the recent trends in anatomy & physiology and molecular medicine (15%)

- (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 experimental scientific discipline.
- (d) Principle, standard and ethical issues for the animal experimental procedure in experimental physiology

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

3. National and global trends and Issues regarding the Anatomy and Physiology Education (10%)

- (a) Digital Transformation in Medical Education – Increasing use of virtual dissection tables, AR/VR, and simulation-based learning in anatomy education.
- (b) Shortage of Cadaver-Based Learning Resources – Ethical and logistical challenges in acquiring and using cadavers for anatomy teaching.
- (c) Advances in Molecular and Personalized Medicine – Integration of functional genomics, molecular diagnostics, RNA therapy, and precision medicine in physiology education.
- (d) Ethical and Regulatory Issues in Animal and Human Research – Global and national guidelines on animal experimentation and alternatives to live dissections.
- (e) Globalization & Standardization of Medical Education – Differences in curricula and teaching approaches across USMLE (USA), PLAB (UK), NMC (India), and international medical boards.
- (f) COVID-19 & the Rise of Online Learning – Challenges and opportunities in hybrid and online anatomy and physiology education post-pandemic.
- (g) Open Educational Resources in Anatomy & Physiology – Growing global access to free, high-quality anatomy and physiology learning platforms like OpenStax and Visible Body.

4. Teaching and Research Methodology (10%)

- (a) Teaching Skills & Strategies – Effective communication, student-centered learning, classroom management, and use of technology in Anatomy and Physiology education.
- (b) Common research methods – Conceptualizing a Research Topic, Identifying research gaps, formulating hypotheses, data collection, aligning with current trends, and exploring multidisciplinary research areas.
- (c) Curriculum Review & Lesson Planning – Designing industry-relevant curricula, structuring lesson/work plans, integrating theory with practical learning, and incorporating emerging technologies.
- (d) Academic Planning & Reference Material Development – Preparing quality reference materials, using open educational resources (OER), and structuring academic calendars effectively.
- (e) Culturally Responsive Teaching – Promoting diversity and inclusion, adapting to different learning styles, and module based teaching & evaluation.
- (f) Research Paper & Proposal Writing – Structuring research papers, writing proposals, maintaining academic integrity, and selecting high-impact journals.
- (g) Assessment & Evaluation Methods – Implementing effective assessment techniques, feedback mechanisms, and ensuring student engagement through innovative teaching practices.

5. Governance, Policies, and Legal Framework of Gandaki University (5%)

Overview of Gandaki University's establishment, vision, academic structure, governance bodies, strategic plans, key acts, laws, and bylaws, and Nepal's higher education policies.