



Syllabus for Written Examination

(For Special Internal Competition)

Post: **Assistant Professor/Lecturer**

Subject: **Pharmaceutical Sciences** (Major: M Pharm. in Natural Products Chemistry /Pharmacognosy/
Pharmaceutical Analysis/ Photochemistry/Drug Discovery)

1. **The knowledge of the related subject matters which are generally included in the concerned bachelor and master level courses (60%)**
 - (a) A general review on the source of drugs, primary and secondary metabolism
 - (b) Pharmacognostic study of medicinal and aromatic plants of Nepal.
 - (c) Phytochemical and pharmacological screening of the plant extracts and active phytochemicals (common in-vitro, in-vivo, and in-silico tests)
 - (d) Chemistry, biosynthesis, and pharmacological activities of major primary and secondary metabolites (alkaloids, polyphenols, tannins, glycosides, steroids, terpenoids, flavonoids lipids, enzymes and proteins, lignin and pectin, etc.).
 - (e) Pharmacopoeia and related drugs of biological origins.
 - (f) Extraction, isolation, and purification of phytochemicals.
 - (g) Structure elucidation and spectroscopic analysis of phytopharmaceuticals (NMR, Mass spectrometer, IR, HPLC, GC, and UV).
 - (h) Chromatographic, electrical, titrimetric, and biological techniques of drug analysis with their applications.
 - (i) Identification, validation, and optimization of target molecules and clinical trials of natural drugs
 - (j) Traditional and complementary/alternative systems of medicine.
 - (k) Plant tissue culture, biotechnology, and bio-prospecting.
 - (l) Insight on plant hormones and toxicity of natural drugs.
 - (m) Principles and uses of different types of titrations and electrochemical methods of analysis of drug and drug substances.
2. **Basic knowledge of the recent trends in Natural Products Chemistry, Pharmacognosy, Drug Discovery, Phytochemistry, and Pharmaceutical Analysis (15%)**
 - (a) Current status and future scope of pharmaceutical chemistry.
 - (b) Drug design, discovery, and development from the natural or synthetic source of the drug.
 - (c) New technologies used in pharmaceutical analysis to fasten the drug discovery process.
 - (d) Cultivation, utilization, and commercialization of medicinal plants and their products.
 - (e) Quality control guidelines for quality control and quality assurance of drugs and drug excipients.
 - (f) Herbal Pharmacology and Formulations.
 - (g) An ethnomedicinal study, Lead discovery, modification, and SAR/QSAR studies of drug molecules.

- (h) Overview of promising Cosmeceuticals and Nutraceuticals of natural origin, their trade, and commerce.
- 3. National and global trends and issues regarding the Pharmaceutical Science Education (10%)**
- (a) Modernization of Pharmacy Education – Shift from traditional to competency-based learning, emphasizing skills, research, and interprofessional education.
 - (b) Integration of Digital Technologies – Use of AI, virtual labs, and machine learning in pharmaceutical education and research.
 - (c) Regulatory and Accreditation Standards – Compliance with Medical Education Council, WHO, FIP, ACPE, and other international guidelines.
 - (d) Integration of Traditional and Modern Medicine – Nepal’s approach to Ayurveda, herbal medicines, and allopathic pharmaceuticals in education.
- 4. Teaching and Research Methodology (10%)**
- (a) Teaching Skills & Strategies – Effective communication, student-centered learning, classroom management, and use of technology in higher education in Pharmaceutical Sciences.
 - (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.