

National Academic Reference Standard (NARS)

1. Attributes of the Graduates

Pharmacy graduates work in a multi-disciplinary profession and must acquire the necessary attributes in various pharmacy aspects for pursuing their career. They should demonstrate comprehensive knowledge, clear understanding and outstanding skills as follows:

- 1.1. Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations.
- 1.2. Capable of formulating, preparing pharmaceutical products from different sources and participating in systems for dispensing storage and distribution of medications.
- 1.3. Perform various qualitative and quantitative analytical techniques and fulfill criteria of GLP and GPMP to assure the quality of raw materials, procedures and pharmaceutical products.
- 1.4. Provide information and education services to community and patients about rational use of medications and medical devices.
- 1.5. Comprehend principles of pathophysiology of diseases and participate with other health care professionals in improving health care services using evidence-based data.
- 1.6. Plan, design and conduct research using appropriate methodologies.
- 1.7. Develop presentation, promotion, marketing, business administration, numeric and computation skills.
- 1.8. Demonstrate capability of communication skills, time management, critical thinking, problem solving, decision-making and team working.
- 1.9. Perform responsibilities in compliance with legal, ethical and professional rules.
- 1.10. Able to be a life-long learner for continuous improvement of professional knowledge and skills.

2- Knowledge and Understanding:

- 2.1. Principles of basics, pharmaceutical, medical, social, behavioral, management, health and environmental science as well as pharmacy practice

- 2.2.** Physicochemical properties of various substances used in preparation of medicines including inactive and active ingredient as well as biotechnology and radiolabelled products.
- 2.3.** Principles of different analytical techniques using GLP guidelines and validation procedure.
- 2.4.** Principles of isolation, synthesis, purification, identification and standardization methods of pharmaceutical products.
- 2.5.** Principles of drug design, development and synthesis.
- 2.6.** Properties of different pharmaceutical dosage form including novel drug delivery systems.
- 2.7.** Principles of various instruments and techniques including sampling, manufacturing, packaging, labeling, storing and distribution processes in pharmaceutical industry.
- 2.8.** Principles of pharmacokinetics and biopharmaceutics with applications in therapeutic drug monitoring, dose modification and bioequivalence study.
- 2.9.** Principles of hospital pharmacy including i.v. admixture, TPN and drug distribution system.
- 2.10.** Principles of public health issues including sources and control of microbial contamination as well as sanitation, disinfection, sterilization methods and microbiological QC of pharmaceutical products.
- 2.11.** Principles of body functions in health and disease states as well as basis of genomic and different biochemical pathways regarding their different correlation with different diseases.
- 2.12.** Etiology, epidemiology and laboratory diagnosis and clinical features of different disease and their pharmacotherapeutic approach.
- 2.13.** Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contraindications, ADRs, and drug interactions.
- 2.14.** Principles of clinical pharmacology, pharmacovigilance and rational use of the drugs.
- 2.15.** Basis of complementary and alternative medicine.
- 2.16.** Toxic profile of drugs and other xenobiotics including sources, identification, symptoms, management control and first aid measures.
- 2.17.** Methods of biostatistical analysis and pharmaceutical calculations.
- 2.18.** Principles of management including financial and human resources.

2.19. Principles of drug promotion, sales and marketing, business administration, accounting and pharmacoeconomics.

2.20. Principles of proper documentation and drug filing systems.

2.21. Regulatory affairs, pharmacy laws and ethics of health care and pharmacy profession.

3- Professional and Practical Skills:

3.1. Use the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.

3.2. Handle and dispose chemicals and pharmaceutical preparation safely.

3.3. Compound, dispense, label, store and distribute medicines effectively and safely.

3.4. Extract, isolate, synthesize, purify, identify, and / or standardize active substances from different origin.

3.5. Select medicines based on understanding of etiology and pathophysiology of disease.

3.6. Monitor and control microbial growth and carry out laboratory tests for identification of infectious and noninfectious diseases.

3.7. Assess toxicity profiles of different xenobiotics and detect poisons in biological samples.

3.8. Apply techniques used in operating pharmaceutical equipments and instruments.

3.9. Maintain public awareness on rational use of drugs and social health hazards of drug abuse and misuse.

3.10. Advise patients and other healthcare professional about safe and proper use of medicines.

3.11. Conduct research studies and analyze the results.

3.12. Employ proper documentation and drug filing systems.

4- Intellectual Skills:

4.1. Apply pharmaceutical knowledge in the formulation of safe and effective medicines as well as in dealing with new drug delivery systems.

4.2. Comprehend and apply GLP, GMP, GSP, and GCP guidelines in pharmacy practice.

- 4.3. Apply quantitative and qualitative analytical and biological methods for QC and assay of raw materials as well as pharmaceutical preparations.
- 4.4. Recognize and control possible physical and / or chemical incompatibilities that may occur during drug dispensing.
- 4.5. Select the appropriate method of isolation, synthesis, purification, identification, and standardization of active substances from different origin.
- 4.6. Apply the principles of bioinformatics and computer aided tools in drug design.
- 4.7. Apply various principles to determine characteristics of biopharmaceutical products.
- 4.8. Select and assess appropriate methods of infection control to prevent infections and promote public health.
- 4.9. Utilize the pharmacological basis of therapeutics in the proper selection and use of drugs in various disease conditions.
- 4.10. Calculate and adjust dosage and dose regimen of medications.
- 4.11. Assess drug interactions, ADRs and pharmacovigilance.
- 4.12. Apply the principles of pharmacoeconomics in promoting cost / effective pharmacotherapy.
- 4.13. Analyze and interpret experimental results as well as published literature.
- 4.14. Analyze and evaluate evidence-based information needed in pharmacy practice.

5- General and Transferable Skills:

- 5.1. Communicate clearly by verbal and written means.
- 5.2. Retrieve and evaluate information from different sources to improve professional competencies.
- 5.3. Work effectively in a team.
- 5.4. Use numeracy calculation and statistical methods as well as information technology tools.
- 5.5. Practice independent learning needed for continuous professional development.
- 5.6. Adopt ethical, legal and safety guidelines.
- 5.7. Develop financial, sales and market management skills
- 5.8. Demonstrate creativity and time management abilities.
- 5.9. Implement writing and presentation skills.

5.10. Demonstrate critical thinking, problem-solving and decision-making abilities.