Faculty of Pharmacy

Program Specification

Bachelor of Pharmacy

(Clinical Pharmacy Pharm D)

(2019/ 2020)

Specifications of Bachelor of Pharmacy Program (Pharm D Clinical Pharmacy)

A. Basic Information:

1. **Program Title:** Bachelor of Pharmacy (Pharm D Clinical Pharmacy).
2. **Program Type:** Single, credit hour system
3. **Faculty / University:** Faculty of Pharmacy, Zagazig University.
4. **Department (s):**

a) Departments affiliated to faculty of pharmacy

- Department of Pharmaceutical Analytical Chemistry
- Department of Biochemistry
- Department of Pharmaceutics
- Department of Medicinal Chemistry
- Department of Microbiology & Immunology
- Department of Pharmaceutical Organic Chemistry
- Department of Pharmacognosy
- Department of Pharmacology & Toxicology
- Department of Pharmacy Practice

b) Departments not affiliated to faculty of pharmacy:

- Histology, Anatomy and some pharmacy practice courses are taught by different departments at Faculty of Medicine.
- Mathematics department (Faculty of science)
- IT department (Faculty of Engineering)
- English Language department (Faculty of Education)
- Psychology department (Faculty of Education)

5. Coordinator:

- Assis. Prof. Nermeen Awni “Program coordinator”

6. Date of Program specifications approval:

- Date of Program specifications approval: faculty council No 747 (13/4/2020)

N.B.: This program specification was articulated according to NARS in pharmacy education, 2017.

7. Internal & External Evaluator:

Internal evaluator: Prof.Abd allah ElShanawani, Pharmaceutical chemistry department, Faculty of Pharmacy, Zagazig University (Reviewer in National Authority for Quality Assurance and Accreditation of Education, NAQAAE)

Internal evaluator: Prof.Sahar El.Swefey, Biochemistry department, Faculty of Pharmacy, Zagazig University (Reviewer in National Authority for Quality Assurance and Accreditation of Education, NAQAAE)

External evaluator: Prof. Evan Ibrahim Saad, Pharmacology department, Alexandria University (Reviewer in National Authority for Quality Assurance and Accreditation of Education, NAQAAE)

B. Professional Information:

1.Program Aim:

The program aims at preparing pharmacists able to provide appropriate health care to patients inside and outside hospitals as a member of the healthcare team through the design of proper therapeutic plans in collaboration with physicians, proper drug monitoring and studying drug pharmacokinetics resulting in improvement of healthcare outcomes and patient safety.

2.Graduates Attributes:

a. Council patients and the public about the safe and proper use of medicines as well as strategies for disease prevention.

b. Provide professional pharmacy care to individual patients that comply with the ethical guidelines governing the profession.
c. Understand patients' rights to receive safe and high quality healthcare including pharmacy care.
d. Demonstrate respect, sensitivity and empathy when communicating with others.
e. Responsible for information retrieval, evaluation and dissemination to ensure safe and effective use of medicines and pharmacy services.
f. Manage drug distribution by performing the functions of acquisition, preparation, and distribution of drugs to ensure the safety, accuracy and quality of supplied products.
g. Use evidence-based, unbiased and comprehensive information about therapeutics and medicines in assessing the appropriateness, effectiveness, and safety of medications.
h. Apply the principles of scientific research.
i. Collaborate with other healthcare professionals regarding decisions about the use of medicines including selection of the appropriate medicine, dose, dosage, frequency as well as patient monitoring.
j. Maintain appropriate inter-professional relationships required to provide quality pharmacy care to individual patients.
k. Apply knowledge, principles and skills of communication, leadership, business administration, and entrepreneurial skills.
l. Develop good presentation, marketing, numeric, statistics and information technology skills.
m. Undertake continuing professional development to improve clinical knowledge, skills and performance.
n. Improve professional competence through the use of appropriate learning to address areas identified for professional improvement / growth.

3.Competencies of the Pharmacy Graduates:

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

1-1- COMPETENCY

Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.

Key elements:

1.C1.1. Illustrate the principles of basic sciences: Organic and analytical chemistry; Biophysics; Biology; English language; Information technology and mathematics.

1.C1.2. Outline the principles of pharmaceutical sciences: Pharmacy orientation; Medical terminology; Physical pharmacy; Pharmaceutics; Pharmaceutical technology; Biopharmaceutics and pharmacokinetics; Medicinal chemistry; Pharmacognosy; Pharmaceutical microbiology; Biotechnology & Molecular biology; Quality Control of Pharmaceuticals and Instrumental analysis.

1.C1.3.Explain the principles of medical sciences: Anatomy; Histology; Physiology and pathophysiology; Biochemistry; Clinical biochemistry; Pharmacology; Medical microbiology; Pathology; General microbiology and immunology; Parasitology and virology, and Bioinformatics.

1.C1.4. State the basics of social and behavioral sciences: Human Rights and Fighting of Corruption; Psychology; Scientific writing and communication skills.

1.C1.5. Outline the fundamentals of administrative sciences: Principles of quality assurance; Entrepreneurship; Marketing and pharmacoeconomics; Pharmaceutical legislation and professional ethics.

1.C1.6. List the principles of health and environmental sciences: Public Health and Preventive Medicine; Biostatistics; Basic and clinical toxicology; First Aid and Basic Life Support.

1.C1.7. state the principles of pharmacy practice & clinical sciences : Clinical pharmacokinetics; Clinical pharmacy practice; Drug information; Community and Hospital pharmacy practice, Pharmacotherapy of different diseases; Phytotherapy and aromatherapy; Clinical Research methodology & Pharmacovigilance and Professional Practice.

1C1.8. Use the proper pharmaceutical, medical terms, abbreviations and symbols in pharmacy practice.

1.C1.9. Implement pharmaceutical knowledge in proper handling, identification, extraction, design, preparation, analysis and quality assurance of synthetic/natural pharmaceutical materials/products.

1.C1.10. Retrieve information to explain pharmacological properties of drugs including mechanism of drug action, adverse reactions, contraindications, drug allergies and drug-drug interactions.

1.C1.11. Apply pharmacological and pharmacotherapeutic principles in the proper selection of drugs for the management of different diseases.

1.C1.12. Asses the appropriateness of medicines for a given disease based on aetiology, pathophysiology, severity, patient medical history, possible interactions and age-related factors.

1.C1.13. Apply knowledge from basic sciences while solving drug related problems such as adverse drug reactions, drug allergies or sensitivities as well as contraindications to prescription and non-prescription drugs.

1.C1.14. Determine the depth of information required to answer a question.

1.C1.15. Identify whether tertiary, secondary or primary literature is necessary to appropriately respond to the request for information or recommendations.

1.C1.16. Collect and interpret information to provide necessary advice or recommendations to the prescriber on medicine therapy, including the selection of the appropriate medication or dosage.

1.C1.17. Systematically access reliable information in a timely and accurate manner.

1.C1.18. Analyse emerging practice guidelines, theories and technologies that affects patient health outcomes.

1.C1.19. Identify newly emerging issues related to pharmaceutical industry, drug delivery systems as well as pharmaceutical plant biotechnology.

DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE
2-1- COMPETENCY
Work collaboratively as a member of an inter-professional health care team to improve the quality of life of individuals and communities, and respect patients' rights.
Key elements:
2.C1.1. Carry out duties in compliance with the national code of ethics for pharmacists.

2. C1.2. Collaborate with other health-care providers to optimize the use of medication and promote health.
2.C1.3. Recognize legislation relevant to their practice setting including pharmacy and medicines law.

2.C1.4. Treat others with sensitivity, empathy, respect and dignity.
2.C1.5. Understand patients' rights to receive safe and high quality healthcare including pharmacy care.

2.C1.6. Recognize unique patient considerations such as education level, understanding level, cultural beliefs, literacy, native language and physical and mental capacity in all individual patient assessments.

2.C1.7.Work with patients and other health care professionals to determine which treatments will best meet the patient's therapeutic needs

2.C1.8. Advise patients when and what circumstances in which to seek further medical intervention.

2-2- COMPETENCY

Standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines.

Key elements:

2.C2.1. Practice design, identification, synthesis, purification, isolation, analysis and standardization of synthetic and natural pharmaceutical materials.

2.C2.2. Apply pharmaceutical knowledge to select appropriate ingredients and excipients of the required quality standard for the manufacture and compounding of different pharmaceutical dosage forms with application of good manufacturing practice (GMP) principles.

2.C2.3. Solve problems concerning physical and chemical incompatibilities that may occur during drug manufacture and dispensing.

2.C2.4. Demonstrate an understanding of quality control tests and required records and documentation.

2.C2.5. Identify proper storage conditions for different pharmaceuticals.

2.C2.6. Adopt good handling and distribution techniques for all medical products that assure reliability and safety of the medicine supply.

2.C2.7. Describe the principles of various instruments and analytical techniques.

2.C2.8. Select the appropriate methods for synthesis and analysis of different pharmaceuticals.

2.C2.9. Manipulate equipment and devices properly for synthesis and analysis of different dosage forms.

2.C2.10. Apply principles of pharmacokinetics and biopharmaceutics in dose calculation , selection of dosage regimen, bioequivalence studies as well as formulation of new, safe and effective drug delivery systems.

2.C2.11.Apply principles of bio-informatics and computer-aided tools.

2.C2.12. Demonstrate the ability to perform biostatistical analysis and pharmaceutical calculations accurately.

2.C2.13. Apply basic knowledge to undertake a therapeutic review of the prescription to ensure pharmaceutical and clinical appropriateness of the treatment for the patient.

2-3- COMPETENCY

Handle and dispose biologicals and synthetic/natural pharmaceutical materials/products effectively and safely with respect to relevant laws and legislations.

Key elements:

2.C3.1. Handle and dispose chemicals, solvents, biological specimens, natural wastes and radiopharmaceuticals in an appropriate way avoiding any environmental hazards.

2.C3.2.Apply GLP guidelines for safe handling and disposal of pharmaceutical materials/ products.

2-4- COMPETENCY

Actively share professional decisions and proper actions to save patient's life in emergency situations including poisoning with various xenobiotics, and effectively work in forensic fields.

Key elements:

2.C4.1. Advise patients and other health care professionals about the safe and effective use of medicines and poisons.

2.C4.2. Demonstrate essential life- saving skills.

2.C4.3. Identify and manage any drug related problems including adverse drug reactions, contraindications, allergies, drug-drug/drug-food interactions, medication errors, misuse or medicine abuse as well as defects in product quality.

2.C4.4. Assess the complete data profile about the toxic effects of several xenobiotic.

2.C4.5.Detect poisonous substances in biological specimens.

2-5- COMPETENCY

Contribute in pharmaceutical research studies and clinical trials needed to authorize medicinal products.

Key elements:

2.C5.1.Demonstrate an understanding of the requirements of the regulatory framework to authorise a medicinal product including the quality, safety and efficacy requirements.

2.C5.2. Gather information from a number of reliable sources to make well-founded decisions.

2.C5.3. Demonstrate the ability to make accurate, evidenced based and timely decisions for the management of patients.

2.C5.4. Prepare a complete, succinct report of a research plan.

2.C5.5. Conduct a research project in an appropriate, scientific manner to faculty and peers.

2.C5.6. Prepare written reports that meet publishable standards.

2-6- COMPETENCY

Perform pharmacoeconomic analysis and develop promotion, sales, marketing, and business administration skills.

Key elements:

2.C6.1. Demonstrate an understanding of the principles of organisation and management.

2.C6.2.Apply knowledge of financial management / controls, cash and assets management, budgeting, as well as strategic planning and risk management.

2.C6.3. Recognise quality as a core principle of management and healthcare provision.

2.C6.4.Apply the components of a marketing strategy (price, product, place and promotion) in an institutional pharmacy setting.

2.C6.5. Develop a customized marketing plan for different pharmaceutical settings.

2.C6.6. Apply the principles of pharmacoeconomic assessment and medicines cost benefits analysis.

DOMAIN 3: PHARMACEUTICAL CARE

3-1- COMPETENCY

Apply the principles of body functions to participate in improving health care services using evidence-based data.

Key elements:

3.C1.1. Apply the principles of body function, basis of genomics and different biochemical pathways regarding their correlation with different diseases as well as their management.

3.C1.2.Select appropriate nutritional approaches for the management of different medical conditions

3.C1.3. Suggest the appropriate methods for infection control & public health promotion.

3.C1.4. Perform microscopical, biochemical and serological laboratory tests to diagnose infectious and non infectious diseases.

3.C1.5.Identify the degree of monitoring required by a patient according to the health risks posed by the patient's medication, drug related problem, or disease.

3.C1.6. Develop therapeutic plans for a given disease/infection based on its etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infection/ disease.

3.C1.7.Evaluate the selected drug therapy based on the patient`s progress and laboratory results.

3-2- COMPETENCY

Provide counseling and education services to patients and communities about safe and rational use of medicines and medical devices.

Key elements:

3.C2.1.Advise patients and other health care professionals about efficacy of pharmaceutical products, the proper and safe use of medicines as well as possible interactions with other drugs or food.

3.C2.2. Apply the principles of clinical pharmacology and pharmacovigilance to avoid adverse events with medication and achieve safe use of medicines.

3.C2.3. Recommend the use of appropriate tools to ensure effective drug use and patient compliance.

3.C2.4. Retrieve the information necessary to provide recommendations about efficacy, toxicity, side effects or interactions of natural health products including phytotherapy, aromatherapy, and nutraceuticals.

3.C2.5. Educate patients and community about toxic profiles of drugs and other toxic substances, e.g. metals, organic contaminants and pesticides including signs, symptoms and sources and how to use those for risk management.

3.C2.6. Advises patients, the public and other healthcare professionals on the safe and rational use of medicines and devices including the use, contraindications, storage, and side effects of non-prescription and prescription medicines.

3.C2.7. Provide information, advice and education for patients and the public on health awareness, disease prevention and control, healthy lifestyle, wellness as well as hazards of drug abuse and misuse.

DOMAIN 4: PERSONAL PRACTICE

4-1- COMPETENCY

Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.

Key elements:

4.C1.1. Recognise the value and structure of the pharmacy team and of a multiprofessional team.

4.C1.2. Collaborate with other healthcare professionals to manage the care of a patient.

4.C1.3. Manage time as evidenced by the ability to plan and implement efficient mode of working.

4.C1.4. Work with other members to retrieve and critically review the information necessary to provide recommendations in relation to the management of patients.

4.C1.5. Develop problem solving skills including problem identification and design of management plan in collaboration with other health care professionals.

4.C1.6. Recognise when it is appropriate to seek advice from experienced colleagues or refer decisions to a higher level of authority.

4.C1.7. Demonstrate creativity and entrepreneurial skills.

4-2- COMPETENCY

Effectively communicate verbally, non-verbally and in writing with individuals and communities.

Key elements:

4.C2.1. Use appropriate communication skills with patients and other health care professionals and communities.

4.C2.2.Document information to promote patient safety and / or to meet legal requirements.

4.C2.3. Demonstrate good information technology skills as well as presentation skills.

4-3- COMPETENCY

Express self-awareness and be a life-long learner for continuous professional improvement.

Key elements:

4.C3.1. Demonstrate the ability to critically reflect on their own practice and skills, to identify learning and development needs.

4.C3.2. Implement continuing professional development strategies to improve current and future performance.

Matrix1: Comparisons of Graduates Attributes with the National Academic Reference Standard, 2017

Attributes of the graduates (NARS, 2017)	Program Graduates Attributes
1. Educate and counsel individuals and communities to participate in optimizing therapeutic outcomes and minimizing the incidence of illness of individuals and populations.	a. Council patients and the public about the safe and proper use of medicines as well as strategies for disease prevention.
2. Practice and perform responsibilities and authorities legally, professionally, and ethically respecting patients' rights.	b. Provide professional pharmacy care to individual patients that complies with the ethical guidelines governing the profession. c. Understand patients' rights to receive safe and high quality

	healthcare including pharmacy care. d. Demonstrate respect, sensitivity and empathy when communicating with others.
3. Utilize evidence-based data to deliver contemporary pharmaceutical products and pharmacy services.	e. Responsible for information retrieval, evaluation and dissemination to ensure safe and effective use of medicines and pharmacy services.
4. Assure the quality of pharmaceutical materials and products.	f. Manage drug distribution by performing the functions of acquisition, preparation, and distribution of drugs to ensure the safety, accuracy and quality of supplied products.
5. Apply integrated evidence-based pharmaceutical and clinical information in assessing the appropriateness, effectiveness, and safety of medications.	g. Use evidence-based, unbiased and comprehensive information about therapeutics and medicines in assessing the appropriateness, effectiveness, and safety of medications.
6. Contribute effectively in planning and conducting research using appropriate methodologies.	h. Apply the principles of scientific research.
7. Work collaboratively and share therapeutic decision-making as a member of an interprofessional health care team.	i. Collaborate with other healthcare professionals regarding decisions about the use of medicines including selection of the appropriate medicine,

	dose, dosage, frequency as well as patient monitoring. j. maintain appropriate inter-professional relationships required to provide quality pharmacy care to individual patients.
8. Demonstrate effective communication, leadership, business administration, and entrepreneurial skills.	k. Apply knowledge, principles and skills of communication, leadership, business administration and entrepreneurial skills. l. Develop good presentation, marketing, numeric, statistics and information technology skills.
9. Work as a life-long learner for continuous professional improvement and demonstrate capabilities of performance appraisal and self-assessment.	m. Undertake continuing professional development to improve clinical knowledge, skills and performance. n. improve professional competence through the use of appropriate learning to address areas identified for professional improvement / growth.

Matrix2: Comparison between the Program key elements and the National Academic Reference Standards, NARS 2017 key elements.

DOMAIN 1- FUNDAMENTAL KNOWLEDGE

1-1- COMPETENCY

Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.

Key elements, NARs 2017	*Program key elements*
1-1-1- Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.1. Illustrate the principles of basic sciences: Organic and analytical chemistry; Biophysics; Biology; English language; Information technology and mathematics. 1.C1.2. Outline the principles of pharmaceutical sciences: Pharmacy orientation; Medical terminology; Physical pharmacy; Pharmaceutics; Pharmaceutical technology; Biopharmaceutics and pharmacokinetics; Medicinal chemistry; Pharmacognosy; Pharmaceutical microbiology; Biotechnology & Molecular biology; Quality Control of Pharmaceuticals and Instrumental analysis. 1.C1.3. Explain the principles of medical sciences: Anatomy; Histology; Physiology and pathophysiology; Biochemistry; Clinical biochemistry; Pharmacology; Medical microbiology; Pathology; General microbiology and immunology; Parasitology and virology, and

	Bioinformatics. 1.C1.4. State the basics of social and behavioral sciences: Human Rights and Fighting of Corruption; Psychology; Scientific writing and communication skills. 1.C1.5. Outline the fundamentals of administrative sciences: Principles of quality; Entrepreneurship; Marketing and pharmacoeconomics; Pharmaceutical legislation and professional ethics. 1.C1.6. List the principles of health and environmental sciences: Public Health and Preventive Medicine; Biostatistics ; Basic and clinical toxicology; First Aid and Basic Life Support. 1.C1.7. State the principles of pharmacy practice & clinical sciences : Clinical pharmacokinetics; Clinical pharmacy practice; Drug information; Community and Hospital pharmacy practice, Pharmacotherapy of different diseases; Phytotherapy and aromatherapy; Clinical Research methodology & Pharmacovigilance and Professional Practice.
1-1-2- Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8. Use the proper pharmaceutical, medical terms, abbreviations and symbols in pharmacy practice.

1-1-3- Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/ natural pharmaceutical materials/products.	1.C1.9. Implement pharmaceutical knowledge in proper handling, identification, extraction, design, preparation, analysis and quality assurance of synthetic/natural pharmaceutical materials/products.
1-1-4- Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.10. Retrieve information to explain pharmacological properties of drugs including mechanism of drug action, adverse reactions, contraindications, drug allergies and drug-drug interactions. 1.C1.11. Apply pharmacological and pharmacotherapeutic principles in the proper selection of drugs for the management of different diseases. 1.C1.12. Asses the appropriateness of medicines for a given disease based on aetiology, pathophysiology, severity, patient medical history, possible interactions and age-related factors.
1-1-5- Retrieve information from fundamental sciences to solve therapeutic problems.	1.C1.13. Apply knowledge from basic sciences while solving drug related problems such as adverse drug reactions, drug allergies or sensitivities as well as contraindications to prescription and non-prescription drugs.
1-1-6- Utilize scientific literature, and collect and interpret information to enhance	1. C1.14. Determine the depth of information required to answer a question.

professional decision	1.C1.15. Identify whether tertiary, secondary or primary literature is necessary to appropriately respond to the request for information or recommendations. 1.C1.16. Collect and interpret information to provide necessary advice or recommendations to the prescriber on medicine therapy, including the selection of the appropriate medication or dosage. 1.C1.17. Systematically access reliable information in a timely and accurate manner.
1-1-7- Identify and critically analyze newly emerging issues influencing pharmaceutical industry and patient health care.	1.C1.18. Analyse emerging practice guidelines, theories and technologies that affects patient health outcomes. 1.C1.19. Identify newly emerging issues related to pharmaceutical industry, drug delivery systems as well as pharmaceutical plant biotechnology.
DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE	
2-1- COMPETENCY Work collaboratively as a member of an inter-professional health care team to improve the quality of life of individuals and communities, and respect patients' rights.	
2-1-1 Perform responsibilities and authorities in compliance with the legal and professional structure and role of all members of the health care professional team.	2.C1.1. Carry out duties in compliance with the national code of ethics for pharmacists. 2.C1.2. Collaborate with other health-care providers to optimize the use of medication and promote health. 2.C1.3. Recognize legislation relevant to their

	practice setting including pharmacy and medicines law.
2-1-2 Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	2.C1.4. Treat others with sensitivity, empathy, respect and dignity. 2.C1.5 . Understand patients' rights to receive safe and high quality healthcare including pharmacy care. 2.C1.6. Recognize unique patient considerations such as education level, cultural beliefs, literacy, native language and physical and mental capacity in all individual patient assessments.
2-1-3 Recognize own personal and professional limitations and accept the conditions of referral to or guidance from other members of the health care team.	2.C1.7.Work with patients and other health care professionals to determine which treatments will best meet the patient's therapeutic needs 2.C1.8. Advise patients when and what circumstances in which to seek further medical intervention.
2-2- COMPETENCY Standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines.	
2-2-1 Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/ natural pharmaceutical materials.	2. C2.1. Practice design, identification, synthesis, purification, isolation, analysis and standardization of synthetic and natural pharmaceutical materials.
2-2-2 Apply the basic requirements of quality management system in developing, manufacturing,	2.C2.2. Apply pharmaceutical knowledge to select appropriate ingredients and excipients of the required quality standard for the manufacture and

analyzing, storing, and distributing pharmaceutical materials/ products considering various incompatibilities.	compounding of different pharmaceutical dosage forms with application of good manufacturing practice (GMP) principles. 2.C2.3. Solve problems concerning physical and chemical incompatibilities that may occur during drug manufacture and dispensing. 2.C2.4. Demonstrate an understanding of quality control tests and required records and documentation. 2.C2.5. Identify proper storage conditions for different pharmaceuticals.
2-2-3 Recognize the principles of various tools and instruments, and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.	2.C2.6. Adopt good handling and distribution techniques for all medical products that assures reliability and safety of the medicine supply. 2.C2.7. Describe the principles of various instruments and analytical techniques. 2.C2.8. Select the appropriate methods for synthesis and analysis of different pharmaceuticals. 2.C2.9. Manipulate equipment and devices properly for synthesis and analysis of different dosage forms.
2-2-4 Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and bio-pharmaceutics and their applications in new drug delivery systems, dose modification,	2.C2.10. Apply principles of pharmacokinetics and biopharmaceutics in dose calculation , selection of dosage regimen, bioequivalence studies as well as formulation of new, safe and effective drug delivery systems. 2.C2.11. Apply principles of bio-informatics and

bioequivalence studies, and pharmacy practice.	computer-aided tools. 2.C2.12. Demonstrate the ability to perform biostatistical analysis and pharmaceutical calculations accurately. 2.C2.13. Apply basic knowledge to undertake a therapeutic review of the prescription to ensure pharmaceutical and clinical appropriateness of the treatment for the patient.
2-3- COMPETENCY Handle and dispose biologicals and synthetic/natural pharmaceutical materials /products effectively and safely with respect to relevant laws and legislations.	
2-3-1 Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field.	2.C3.1. Handle and dispose chemicals, solvents, biological specimens, natural wastes and radiopharmaceuticals in an appropriate way avoiding any environmental hazards. 2.C3.2. Apply GLP guidelines for safe handling and disposal of pharmaceutical materials/ products.
2-3-2 Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.	
2-4- COMPETENCY Actively share professional decisions and proper actions to save patient's life in emergency situations including poisoning with various xenobiotics, and effectively work in forensic fields.	
2-4-1 Ensure safe handling/ use of poisons to avoid their harm to individuals and communities.	2.C4.1. Advise patients and other health care professionals about the safe and effective use of medicines and poisons.

2-4-2Demonstrate understanding of the first aid measures needed to save patient's life.	2.C4.2. Demonstrate essential life- saving skills.
2-4-3 Take actions to solve any identified medicine-related and pharmaceutical care problems.	2.C4.3. Identify and manage any drug related problems including adverse drug reactions, contraindications, allergies, drug-drug/drug-food interactions, medication errors, misuse or medicine abuse as well as defects in product quality.
2-4-4 Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens.	2.C4.4. Assess the complete data profile about the toxic effects of several xenobiotic. 2.C4.5. Detect poisonous substances in biological specimens.
2-5- COMPETENCY Contribute in pharmaceutical research studies and clinical trials needed to authorize medicinal products.	
2-5-1 Fulfill the requirements of the regulatory framework to authorize a medicinal product including quality, safety, and efficacy requirements.	2.C5.1.Demonstrate an understanding of the requirements of the regulatory framework to authorise a medicinal product including the quality, safety and efficacy requirements.
2-5-2 Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession.	2.C5.2. Gather information from a number of reliable sources to make well-founded decisions. 2.C5.3. Demonstrate the ability to make accurate, evidenced based and timely decisions for the management of patients.
2-5-3 Contribute in planning and conducting research studies using appropriate methodologies.	2.C5.4. Prepare a complete, succinct report of a research plan. 2.C5.5. Conduct and present a research project in an

	appropriate, scientific manner to faculty and peers. 2.C5.6. Prepare written reports that meet publishable standards.
2-6- COMPETENCY Perform pharmacoeconomic analysis and develop promotion, sales, marketing, and business administration skills.	
2-6-1 Apply the principles of business administration and management to ensure rational use of financial and human resources.	2.C6.1. Demonstrate an understanding of the principles of organisation and management. 2.C6.2.Apply knowledge of financial management / controls, cash and assets management, budgeting, as well as strategic planning and risk management. 2.C6.3. Recognise quality as a core principle of management and healthcare provision.
2-6-2 Utilize the principles of drug promotion, sales, marketing, accounting, and pharmacoeconomic analysis.	2.C6.4. Apply the components of a marketing strategy (price, product, place and promotion) in an institutional pharmacy setting. 2.C6.5. Develop a customized marketing plan for different pharmaceutical settings. 2.C6.6. Apply the principles of pharmacoeconomic assessment and medicines cost benefits analysis.
DOMAIN 3: PHARMACEUTICAL CARE	
3-1- COMPETENCY Apply the principles of body functions to participate in improving health care services using evidence-based data.	
3-1-1 Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.	3.C1.1.Apply the principles of body function, basis of genomics and different biochemical pathways regarding their correlation with different diseases as well as their management.

	3.C1.2.Select appropriate nutritional approaches for the management of different medical conditions.
3-1-2 Apply the principles of public health and pharmaceutical microbiology to select and assess proper methods of infection control.	3.C1.3. Suggest the appropriate methods for infection control & public health promotion.
3-1-3 Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.4. Perform microscopical, biochemical and serological laboratory tests to diagnose infectious and non infectious diseases. 3.C1.5.Identify the degree of monitoring required by a patient according to the health risks posed by the patient's medication, drug related problem, or disease.
3-1-4 Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.6. Develop therapeutic plans for a given disease/infection based on its etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infection/ disease. 3.C1.7. Evaluate the selected drug therapy based on the patient`s progress and laboratory results.
3-2- COMPETENCY Provide counseling and education services to patients and communities about safe and rational use of medicines and medical devices.	
3-2-1 Integrate the pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, adverse drug reactions and drug interactions.	3.C2.1.Advise patients and other health care professionals about efficacy of pharmaceutical products, the proper and safe use of medicines as well as possible interactions with other drugs or food.

3-2-2 Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	3.C2.2. Apply the principles of clinical pharmacology and pharmacovigilance to avoid adverse events with medication and achieve safe use of medicines. 3.C2.3. Recommend the use of appropriate tools to ensure effective drug use and patient compliance.
3-2-3 Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals.	3.C2.4. Retrieve the information necessary to provide recommendations about efficacy, toxicity, side effects or interactions of natural health products including phytotherapy, aromatherapy, and nutraceuticals.
3-2-4 Provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control.	3.C2.5. Educate patients and community about toxic profiles of drugs and other toxic substances, e.g. metals, organic contaminants and pesticides including signs, symptoms and sources and how to use those for risk management.
3-2-5 Educate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC preparations and medical devices.	3.C2.6. Advises patients, the public and other healthcare professionals on the safe and rational use of medicines and devices including the use, contraindications, storage, and side effects of non-prescription and prescription medicines.
3-2-6 Maintain public awareness on social health hazards of drug misuse and abuse.	3.C2.7. Provide information, advice and education for patients and the public on health awareness, disease prevention and control, healthy lifestyle, wellness as well as hazards of drug abuse and misuse.
DOMAIN 4: PERSONAL PRACTICE	

4-1- COMPETENCY Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.	
4-1-1 Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.C1.1. Recognise the value and structure of the pharmacy team and of a multiprofessional team. 4.C1.2. Collaborate with other healthcare professionals to manage the care of a patient. 4.C1.3. Manage time as evidenced by the ability to plan and implement efficient mode of working.
4-1-2 Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.4. Work with other members to retrieve and critically review the information necessary to provide recommendations in relation to the management of patients. 4.C1.5.Develop problem solving skills including problem identification and design of management plan in collaboration with other health care professionals. 4.C1.6. Recognise when it is appropriate to seek advice from experienced colleagues or refer decisions to a higher level of authority.
4-1-3 Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.	4.C1.7. Demonstrate creativity and entrepreneurial skills.
4-2- COMPETENCY Effectively communicate verbally, non-verbally and in writing with individuals and communities.	
4-2-1 Demonstrate effective	4.C2.1. Use appropriate communication skills with

communication skills verbally, non-verbally, and in writing with professional health care team, patients, and communities.	patients and other health care professionals and communities. 4.C2.2.Document information to promote patient safety and / or to meet legal requirements.
4-2-2 Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.Demonstrate good information technology skills as well as presentation skills.
4-3- COMPETENCY Express self-awareness and be a life-long learner for continuous professional improvement.	
4-3-1 Perform self-assessment to enhance professional and personal competencies.	4.C3.1. Demonstrate the ability to critically reflect on their own practice and skills, to identify learning and development needs.
4-3-2 Practice independent learning needed for continuous professional development.	4.C3.2. Implement continuing professional development strategies to improve current and future performance.

2. Program Structure and Contents:

a- Program duration: (5+1) 5 years in ten semesters each term made up of 15 weeks in addition to 1 year professional training in different career fields.

b- Program structure:

- ✓ **Number of credit hours = 176 CH + 6 CH university requirments**
- ✓ The faculty of pharmacy implements the credit hour system. A credit hour represents an hour of lecture (L) or two hours of practical.

Learning activity	Lectures	Practical	Total
No. of hours/week	121	61	182

- ✓ In addition to preliminary 100 hours of field training in which the student should pass after completion of third level. The training may be in community or hospital pharmacy.The sixth year is advanced training & research project
- ✓ **Number of courses = 78**

Courses	Faculty requirements			University requirements	Total
Number	Compulsory courses		Elective courses		
	Non professional	Professional	4	6	78
	5	63			

c- Study Plan:

item	No. of hours
University requirements	6 CH: English Language I & II, Human Rights and Fighting Corruption, Psychology, Principles of Quality Assurance, Entrepreneurship
Faculty compulsory courses	168 CH including 7 CH dedicated to **Non professional Courses (NP) (Supervised by faculty departments)**: Information Technology, Mathematics, Scientific Writing and Communication Skills , Pharmaceutical Legislations and Professional Ethics, Drug Marketing & Pharmacoeconomics
Faculty elective courses	8 CH comprising 4 courses to be selected in the 4th and 5th levels from 17 courses (Infection Control, Chromatography and Separation Techniques, Analysis of Food and Flavor, Advanced Pharmaceutical Analysis – Spectroscopy, Veterinary Pharmacology, Biological Standardization, Cosmetic Preparations, Applied Industrial Pharmacy, Clinical Nutrition, Quality Control of Natural Products, Aromatherapy and Herbal Cosmetics, Biotechnology of Medicinal Plants, Good Manufacturing Practices, Protein Pharmaceuticals, Drug Metabolism and Transport, Quality improvement in healthcare, Drug Design)
Practical field training	1. Preliminary training: 100 contact hours after 3rd level 2. Advanced training: the sixth year of the program (one academic year)
Program level	5 years / ten terms + 1 year of advanced training including research project

d- Field training:

-Field training is divided into 2 phases:

1. Preliminary training : consists of 100 contact hours in which each student will conduct and pass after completion of 3rd level. Training in community or hospital pharmacies.

2. Advanced training & research project: involves one academic year, at the sixth year.

- After completion of 5 years study, student should complete one year training in Hospitals applying clinical pharmacy practice.
- The student should complete at least four clinical rotations.
- One of the rotations should be in pharmaceutical manufacturing & quality control.
- The clinical rotations may include: Oncology, Psychiatry, Critical Care, cardiovascular, Drug information, Nutrition, Pharmacoeconomics, etc

f. Program Key Elements Mapping With Courses Matrix

Semester 1:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEY ELEMENTS COVERED
			Lec	Lab	Total	
PA101	Pharmaceutical Analytical Chemistry I	15	2	1	3	1.C1.1, 1.C1.9, 2.C2.1, 2.C2.8 2.C3.1, 4.C1.3
PR 101	Pharmaceutical Organic chemistry I	15	2	1	3	1.C1.1,2.C2.1, 2.C3.1, 4.C1.3
PT 101	Pharmacy Orientation	15	1	0	1	1.C1.2, 1.C1.8, 2.C1.1, 4.C2.1
PG 101	Medicinal plants	15	2	1	3	1.C1.2, 1.C1.9, 2.C2.1,4.C1.1
MD 101	Medical Terminology	15	1	0	1	1.C1.2, 1.C1.8,
NP 101	Information Technology	15	1	1	2	1.C1.1, 4.C1.3, 4.C2.3
NP 102	Mathematics	15	1	--	1	1.C1.1, 4.C1.5
UR 101	English language I	15	1	--	1	1.C1.1, 4.C2.1, 4.C2.3
UR 102	Human Rights and Fighting of Corruption	15	1	-	1	1.C1.4
Total			**12**	**4**	**16**	

Semester 2:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PR 202	Pharmaceutical Organic chemistry II	15	2	1	3	1.C1.1, 2.C2.1, 2.C3.1, 2.C3.2 4.C1.1, 4.C1.5,
PA 202	Pharmaceutical Analytical chemistry II	15	2	1	3	1.C1.1, 1.C1.9,2.C2.1, 2.C2.5, 2.C2.8, 2.C3.1, 4.C1.1, 4.C1.5
PG 202	PhannacognosyI	15	2	1	3	1.C1.2, 1.C1-9, 2.C2.1, 2.C3.1, 4.C1.1, 4.C2.3
MD 202	Anatomy & Histology	15	2	1	3	1.C1.3, 3.C1.1, 3.C1.4, 4.C1.1, 4.C2.1
PT 202	Physical pharmacy	15	2	1	3	1.C1.2, 2.C2.1,2.C2.2, 2.C2.12, 4.C2.1, 4.C2.3
UR 203	Psychology	15	1	--	1	1.C1.4, 2.C1.4, 2.C1.6, 4.C1.5
PB 201	Cell Biology	15	1	1	2	1.C1.1,2.C3.1 3.C1.1, 3.C1.4, 4.C2.3
UR 204	English language II	15	1	-	1	1.C1.1, 4.C2.1
Total			**13**	**6**	**19**	

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PR 303	Pharmaceutical Organic ChemistryIII	15	2	1	3	1.C1.1, 2.C2.1, 2.C3.1, 2.C3.2, 2.C2.7, 2.C2.8, 4.C1.1, 4.C1.5,
PB 302	Biochemistry I	15	2	1	3	1.C1.3, 2.C3.1,2.C3.2, 3.C1.1, 4.C1.3
PG 303	Pharmacognosy II	15	2	1	3	1.C1.2, 1.C1.9, 2.C2.1, 2.C3.1, 2.C4.1,4.C1.1, 4.C1.3,
MD 303	Biophysics	15	1	1	2	1.C1.1, 1.C1.8, 3.C1.1, 4.C1.1
MD304	**Physiology and Pathophysiology**	15	2	1	3	1.C1.3,1.C1.8 3.C1.1
PM 301	**General Microbiology and Immunology**	15	2	1	3	1.C1.2, 1.C1.3, 1.C1.8, 2.C3.1, 2.C3.2, 3.C1.4, 4.C1.3, 4.C1.4
PT 303	Pharmaceutics I	15	2	1	2	1.C1.2, 2.C2.2, 2.C2.3, 2.C3.1, 4.C1.1, 4.C2.3
Total			**13**	**7**	**20**	

Semester 3:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PR 303	Pharmaceutical Organic ChemistryIII	15	2	1	3	1.C1.1, 2.C2.1, 2.C3.1, 2.C3.2, 2.C2.8, 4.C1.1, 4.C1.5,
PB 302	Biochemistry I	15	2	1	3	1.C1.3, 2.C3.1,2.C3.2, 3.C1.1, 4.C1.3
PG 303	Pharmacognosy II	15	2	1	3	1.C1.2, 1.C1.9, 2.C2.1, 2.C3.1, 2.C4.1,4.C1.1, 4.C1.3,
MD 303	Biophysics	15	1	1	2	1.C1.1, 1.C1.8, 3.C1.1, 4.C1.1
MD304	**Physiology and Pathophysiology**	15	2	1	3	1.C1.3,1.C1.8 3.C1.1
PM 301	**General Microbiology and Immunology**	15	2	1	3	1.C1.2, 1.C1.3, 1.C1.8, 2.C3.1, 2.C3.2, 3.C1.4, 4.C1.3, 4.C1.4
PT 303	Pharmaceutics I	15	2	1	2	1.C1.2, 2.C2.2, 2.C2.3, 2.C2.5 2.C3.1, 4.C1.1
Total			**13**	**7**	**20**	

Semester 4:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PB 403	BiochemistryII	15	2	1	3	1.C1.3,1.C1.8 3.C1.1, 3.C1.4, 4.C1.1, 4.C2.3, 4.C3.1
PA 403	Instrumental Analysis	15	1	1	2	1.C1.2, 2.C2.7, 2.C2.8, 2.C3.1, 4.C1.5, 4.C2.2
PT 404	**Pharmaceutics II**	15	2	1	3	1.C1.2, 2.C2.2, 2.C3.1, 2.C3.2, 4.C1.1, 4.C1.5
PO 401	**Pharmacology I**	15	2	1	3	1.C1.3, 1.C1.8, 1.C1.10, 1.C1.11, 2.C3.2, 3.C2.1, 4.C1.3
PM 402	Pharmaceutical Microbiology	15	2	1	3	1.C1.2, 2.C3.1, 2.C3.2, 2.C4.1, 3.C1.3, 3.C1.7, 4.C1.5, 4.C2.1, 4.C2.3
NP 403	**Scientific Writing and Communication skills**	15	1	1	2	1.C1.4, 2.C1.4, 2.C1.6, 2.C5.6, 4.C1.1, 4.C2.1, 4.C2.3
NP 404	**PharmacyLegislations and Practice ethics**	15	1	-	1	1.C1.5, 2.C1.1, 2.C1.2, 2.C1.3, 2.C1.5, 2.C5.1
UR 405	Principles of Quality Assurance	15	1	-	1	1.C1.5, 2.C6.1, 4.C1.1, 4.C1.5
Total			**12**	**6**	**18**	

Semester 5:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
MD 505	**Pathology**	15	1	1	2	1.C1.3, 1.C1.8, 1.C1.13, 2.C3.1, 3.C1.1, 3.C1.4, 4.C1.3
PO 502	PharmacologyII	15	2	1	3	1.C1.3, 1.C1.8, 1.C1.10, 2.C3.2, 3.C2.1
PM 503	Parasitology & Virology	15	2	1	3	1.C1.2, 1.C1.8, 1.C1.12, 3.C1.3, 3.C1.4, 4.C1.3
PT 505	Pharmaceutics III	15	2	1	3	1.C1.2, 1.C1.8, 2.C2.2, 2.C2.3, 2.C2.4, 2.C2.5, 2.C3.2, 4.C1.3
PG 504	PhytochemistryI	15	2	1	3	1.C1.2, 1.C1.9, 2.C2.1, 2.C2.8, 2.C3.1, 2.C3.2, 3.C2.4, 4.C1.3
PP 501	Community Pharmacy Practice	15	2	1	3	1.C1.7, 2.C1.3, 2.C1.4, 2.C1.6, 2.C1.7, 2.C1.8, 3.C2.1, 3.C2.3, 3.C2.6, 4.C2.1
Total			**11**	**6**	**17**	

Semester 6:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PO 603	PharmacologyIII	15	2	1	3	1.C1.3, 1.C1.8, 1.C1.10, 1.C1.12, 2.C3.1, 2.C3.2, 3.C2.1
PT 606	Pharmaceutical Technology	15	2	1	3	1.C1.2, 1.C1.19, 2.C2.2, 2.C2.7, 2.C2.9, 2.C3.1, 2.C3.2
PP 602	Hospital Pharmacy	15	2	1	3	1.C1.7, 2.C1.1, 2.C1.5, 2.C2.6, 2.C2.12, 2.C3.1, 2.C4.3, 3.C2.3, 4.C1.1, 4.C1.5
PP 603	Clinical Pharmacy Practice	15	2	1	3	1.C1.7, 1.C1.13,1.C1.16, 2.C1.2, 2.C1.7, 2.C2.13, 2.C4.3, 3.C2.3, 4.C1.4, 4.C1.5, 4.C2.2
PG 605	**Phytochemistry II**	15	2	1	3	1.C1.2, 1.C1.9, 2.C2.1, 2.C2.8, 2.C3.1, 2.C3.2
MD 606	First Aid and Basic Life Support	15	1	1	2	1.C1.6, 2.C1.8, 2.C4.2, 4.C1.2

Total			**11**	**6**	**17**	

Semester 7:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PT 707	Advanced Drug Delivery Systems	15	2	0	2	1.C1.2, 1.C1.19, 2.C2.10
PO 704	**Drug Information**	15	1	0	1	1.C1.7, 1.C1.14, 1.C1.15, 1.C1.16, 1.C1.17, 2.C1.1, 2.C4.1, 2.C5.2, 2.C5.3, 4.C1.4
PO 705	PharmacologyIV	15	1	1	2	1.C1.3, 1.C1.8, 1.C1.10, 3.C2.1
PT 708	Biopharmaceutics and Pharmacokinetics	15	2	1	2	1.C1.2, 1.C1.8, 2.C2.10, 2.C2.13, 2.C2.12, 4.C1.5
PC 701	Medicinal chemistryI	15	2	1	3	1.C1.2, 1.C1.8, 1.C1.9, 2.C2.1, 2.C2.8, 2.C3.1, 2.C3.2
PA 704	Quality Control of Pharmaceuticals	15	1	1	2	1.C1.2, 1.C1.9, 2.C2.1, 2.C3.1, 2.C3.2, 2.C5.1
PM 704	Medical microbiology	15	2	1	3	1.C1.3, 1.C1.8, 2.C3.2, 3.C1.4, 3.C1.6, 3.C1.7, 3.C2.1,
PE	**Elective**	15	1	1	2	
Total			**12**	**6**	**18**	

Semester 8:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	

PC 802	**Medicinal Chemistry-II**	15	2	1	3	1.C1.2, 1.C1.8, 2.C2.1, 2.C3.1,
PP 804	**Pharmacotherapy of Endocrine and Renal Disorders**	15	2	1	3	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.18, 2.C4.1, 3.C1.5, 3.C1.6, 3.C1.7, 3.C2.1, 3.C2.6
PP 805	**Pharmacotherapy of Oncological Diseases and Radiotherapy**	15	2	1	3	1.C1.7, 1.C1.11, 1.C1.12, 1.C1.18, 2.C4.1, 3.C1.5
PP 806	**Clinical Pharmacokinetics**	15	2	1	3	1.C1.7, 2.C2.10, 2.C2.12, 3.C1.5, 4.C1.5
PB 804	Clinical Biochemistry	15	2	1	3	1.C1.2,1.C1.8, 3.C1.1, 3.C1.4, 3.C1.2, , 2.C3.1, 2.C3.2, 4.C2.2
PM 805	**Public Health and Preventive Medicine**	15	2	-	2	1.C1.6, 3.C1.3, 3.C2.7, 4.C2.1
PE	Elective course	15	1	1	2	
Total			**13**	**6**	**19**	

Semester 9:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PO 906	**Basic & clinical Toxicology**	15	2	1	3	1.C1.6, 2.C4.1, 2.C4.2, 2.C4.4, 2.C4.5, 3.C2.5, 3.C2.6
PP 907	Pharmacotherapy of Neuropsychiatric Diseases	15	1	1	2	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.16, 2.C4.1, 3.C1.5, 3.C1.6, 3.C1.7
PM 906	Biotechnology& Molecular Biology	15	2	1	3	1.C1.2, 1.C1.8, 3.C1.1, 4.C2.3
PG 906	**Phytotherapy**	15	2	1	3	1.C1.7, 1.C1.8, 1.C1.10, 1.C1.14, 3.C2.4, 3.C2.6, 4.C1.5
PC 903	**Medicinal Chemistry III**	15	2	1	3	1.C1.2, 1.C1.9, 2.C2.1, 2.C3.2, 3.C2.6
NP 905	**Marketing & Pharmacoeconomis**	15	1	--	1	1.C1.5, 2.C6.4, 2.C6.5, 2.C6.6

UR 906	Entrepreneurship	15	1	--	1	1.C1.5, 2.C6.1, 2.C6.2, 4.C1.3, 4.C1.5, 4.C1.7
PE	Elective course	15	1	1	2	
Total			**12**	**6**	**18**	

Semester 10:

COURSE CODE	COURSE TITLE	NO. OF UNITS	CREDIT HOURS/ WEEK			PROGRAM KEYELEMENTS COVERED
			Lec	Lab	Total	
PP 008	Pharmacotherapy of Critical Care Patients	15	1	1	2	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.16, 2.C4.1, 3.C1.6, 3.C1.7, 4.C1.5
PP 009	Pharmacotherapy of Dermatological, Reproductive and Musculoskeletal Diseases	15	2	1	3	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.16, 2.C4.1, 3.C1.6, 3.C1.7, 4.C1.5
PP 010	Pharmacotherapy of Pediatric Diseases	15	1	1	2	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.16, 2.C4.1, 3.C1.6, 3.C1.7, 4.C1.5
PP 011	Pharmacotherapy of Cardiovascular Diseases	15	1	1	2	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.16, 2.C4.1, 3.C1.6, 3.C1.7, 4.C1.5
PP 012	Pharmacotherapy of Gastrointestinal Diseases	15	1	1	2	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.16, 2.C4.1, 3.C1.6, 3.C1.7, 4.C1.5
PP 013	Pharmacotherapy of Respiratory Diseases	15	1	1	2	1.C1.7, 1.C1.8, 1.C1.11, 1.C1.12, 1.C1.16, 2.C4.1,

						3.C1.6, 3.C1.7, 4.C1.5
PP014	**Clinical Research and Pharmacovigilance**	15	1	0	1	1.C1.7, 2.C5.4, 2.C5.5, 2.C5.6, 3.C2.2
PO 007	**Biostatistics**	15	1	--	1	1.C1.6, 2.C2.12, 4.C1.5
UR 006	Bioinformatics	15	1	-	1	1.C1.3, 2.C2.11, 3.C1.1
PP 0015	Professional Practice	15	1	1	2	1.C1.7, 1.C1.11, 1.C1.12, 2.C2.10, 2.C4.1, 2.C4.3, 2.C6.6, 3.C1.2, 3.C1.6, 3.C1.7, 3.C2.6, 4.C1.5, 4.C3.1, 4.C3.2
PE	Elective course	15	1	1	2	
Total			**12**	**8**	**20**	

Elective courses:

Course Code	Course Title	PROGRAM KEYELEMENTS COVERED
PA E 05	Advanced Pharmaceutical Analysis – Spectroscopy	1.C1.2, 1.C1.9, 2.C2.1, 2.C2.4, 2.C2.7, 2.C2.8, 2.C2.9, 2.C3.2
PM E 07	Infection Control	1.C1.2, 2.C1.8, 2.C3.2, 3.C2.7, 4.C1.5
PG E 08	Chromatography and Separation Techniques	1.C1.2, 1.C1.9, 2.C2.4, 2.C2.7, 2.C2.8, 2.C2.9
PG E 09	Analysis of Food and Flavor	1.C1.2, 1.C1.9, 2.C2.1, 2.C2.8, 2.C2.9, 2.C3.1, 2.C3.2
PG E 10	Aromatherapy and Herbal Cosmetics	1.C1.2, 1.C1.7, 1.C1.9,2.C2.1, 2.C2.2, 3.C2.4
PO E 08	Biological Standardization	1.C1.3,1.C1.9, 2.C2.1, 2.C2.4, 4.C2.2, 2.C5.1

PO E 09	Veterinary Pharmacology	1.C1.3, 1.C1.12, 2.C2.2, 2.C2.5
PG E 11	Biotechnology of Medicinal Plants	1.C1.2, 1.C1.19, 4.C1.3, 4.C2.3
PT E 09	Applied Industrial Pharmacy	1.C1.2, 1.C1.19, 2.C2.6, 2.C2.7, 2.C6.4
PT E 010	Good Manufacturing Practices	1.C1.2, 1.C1.19, 2.C2.2, 2.C3.2
PT E 11	Protein Pharmaceuticals	1.C1.2, 1.C1.8, 1.C1.19, 4.C2.3
PT E 012	Drug Metabolism and Transport	1.C1.2, 1.C1.8, 2.C2.10, 2.C4.3
PT E 013	Cosmetic Preparations	1.C1.2, 2.C2.2, 2.C2.3, 2.C2.4, 2.C2.5, 2.C2.8
PP E 16	Quality improvement in healthcare	1.C1.8, 2.C6.1, 2.C6.2, 2.C6.3, 4.C1.5
PC E 04	Drug Design	1.C1.2, 2.C2.11, 4.C2.3
PB E 05	Clinical Nutrition	1.C1.7, 2.C4.3, 3.C1.1, 3.C1.2, 4.C1.4, 4.C1.5

Field training:

Training	Total contact hours	PROGRAM KEYELEMENTS COVERED
1. Preliminary training	100 hr	1.C1.2,1.C1.4, 1.C1.5, 1.C1.6, 1.C1.7, 1.C1.12, 1.C1.13, 1.C1.14, 1.C1.15, 1.C1.16, 1.C1.17, 2.C1.1, 2.C1.2, 2.C1.3, 2.C1.4, 2.C1.5, 2.C1.6, 2.C1.7, 2.C1.8, 2.C2.1, 2.C4.1, 2.C5.2, 2.C5.3, 3.C1.6, 3.C1.7, 3.C2.1, 3.C2.3, 3.C2.4, 3.C2.5,
2. Advanced training	6 rotations within one academic year	

		3.C2.6, 4.C1.1, 4.C1.2, 4.C1.3, 4.C1.5, 4.C2.1, 4.C2.2, 4.C3.1, 4.C3.2

Research project:

Total contact hours	PROGRAM KEYELEMENTS COVERED
within the 6th academic year	1.C1.18, 2.C5.4, 2.C5.5, 2.C5.6, 4.C1.3, 4.C1.4, 4.C1.5, 4.C2.1, 4.C2.3, 4.C3.1, 4.C3.2

3. Program admission requirements:

Candidate should have the general certificate of secondary education (scientific section) or an equivalent certificate from a foreign institute recognized by the university. Courses completed at another faculty are evaluated for equivalency to the Faculty of Pharmacy, Zagazig University courses.

Courses Registration:

Faculty assigns one staff member as an academic advisor for each group of students (20-30 students) who will be responsible for student support regarding academic and social issues. He will follow up students' attendance and progress in different courses as well. In addition, academic advisors will be available to help students select the required and suitable courses from the list of the offered courses. Selection of the courses for any given level is conditional on the successful completion of the prerequisite course of the preceding level.

Courses registration should be done within the allowed time frame for registration according to the academic calendar. Late registration should be done according to a written excuse and not exceed 2 weeks after

the allowed time.

Courses Load:

The course load is the number of registered credit hours per student each semester.

- The academic load in each semester ranges from 12-22 credit hours.
- The academic load in the summer semester ranges from 4 to 10 credit hours.
- The academic load can be increased in the 9 & 10 th level by three hours more than the allowed load (only once) after approval of the faculty council.
- Credits acquired by the student are those of passed courses from the registered academic load.

4. Admission policy:

The faculty complies with the admission regulations and requirements of the Egyptian Supreme Council of Universities (ESCU).

5. Admission of Graduate from other facilities:

Courses complete at another faculty are evaluated for equivalency to the faculty of pharmacy courses. A course waiver remains in effect for five years from the date the course waiver form was signed.

6.Teaching:

Teaching methods used to achieve the predetermined program ILOs include:

- Lectures
- Laboratory sessions
- Case study
- Role play
- Field experience

- Research project
- Demonstrative videos
- Assignment
- Critical thinking strategies
- Problem solving
- E-learning
- Blended learning

5. Assessment:

a. Assessment methods

- Students' performance is assessed by both course work and examination at the end of each course.
- Methods of assessment include written, oral, and practical examination, research papers, course assignments, presentations and reports.
- Grades are measure of the performance of a student in an individual course.
- Correlation between teaching and assessment methods as follows:

Method of assessment	Teaching method
Written examination	• Lectures • Case study • Critical thinking strategies • Problem solving
Practical examination	• Demonstrative videos • Problem solving • Laboratory sessions • Role play
Oral examination	• Lectures • Problem solving
Others (posters, field visit, presentation, projects ..etc.	• Research project • Assignment • Field experience

b. Marks Distribution

- The total grade is out of 100%.
- In order to pass a course the student must obtain a minimum of 60% of the total grade and a minimum of 30% of the final written exam.
- The grades of the Faculty courses are distributed according to the following table:

Type of course	Course	Period./Actv.	Pract.	Wr.	Oral	Total
Course includes a practical and oral exam	• Pharmaceutical Analytical Chemistry I • Pharmaceutical Analytical Chemistry II • Instrumental Analysis • Pharmaceutical Organic Chemistry I • Pharmaceutical Organic Chemistry II • Pharmaceutical Organic Chemistry III • Medicinal Chemistry I • Medicinal Chemistry II • Medicinal Chemistry III • Medicinal Plants • Pharmacognosy I • Pharmacognosy II • Phytochemistry I • Phytochemistry II • Phytotherapy • Physical Pharmacy • Pharmaceutics I • Pharmaceutics II • Pharmaceutics III • Pharmaceutics IV • Biopharmaceutics and Pharmacokinetics • Pharmaceutical	15 (10 midterm + 5 course activity)	25	50	10	100

	Technology • Cell Biology • Biophysics • Biochemistry I • Biochemistry II • Clinical Biochemistry • Physiology and Pathophysiology • Pathology • Pharmacology-1 • Pharmacology II • Pharmacology III • Pharmacology IV • Basic & Clinical Toxicology • General Microbiology and Immunology • Pharmaceutical Microbiology • Parasitology and Virology • Pathology • Medical Microbiology • Biotechnology & Molecular biology • Clinical Pharmacokinetics • Hospital Pharmacy • Clinical Pharmacy Practice • Community Pharmacy Practice • Pharmacotherapy of Oncological Diseases and Radiotherapy • Pharmacotherapy of Neuropsychiatric Diseases • Pharmacotherapy of					

	Critical Care Patients • Pharmacotherapy of Dermatological, Reproductive and Musculoskeletal Diseases • Pharmacotherapy of Pediatric Diseases • Pharmacotherapy of Cardiovascular Diseases • Pharmacotherapy of Gastrointestinal Diseases • Pharmacotherapy of Respiratory Diseases • Quality Control of Pharmaceuticals • Elective					
Course includes a practical and no oral exam.	• Information Technology • Scientific Writing and Communication skills • Drug Information • First Aid and Basic Life Support • Anatomy& Histology • Professional Practice	15 (10 midterm + 5 course activity)	25	60	-	100
Course has no practical or oral exams	• Pharmacy Orientation • Medical Terminology • Mathematics • English language-I • English language-II • Human Rights and Fighting of Corruption • Psychology • Principle of Quality • Pharmaceutical Legislations and	25 (15 midterm + 10 course activity)	-	75	-	100

	Professional ethics • Marketing & Pharmacoeconomics • Public Health and Preventive Medicine • Clinical Research methodology & Pharmacovigilance • Biostatistics • Entrepreneurship • Bioinformatics					
Course includes an oral exam with no practical.	• Advanced Drug Delivery Systems	20 (10 midterm + 10 course activity)	-	70	10	

Type of course	**Period.**	**Pract.**	**Wr.**	**Oral**	**Total**
Course includes a practical and oral exam	15	25	50	10	100
Course includes a practical and no oral exam.	10	25	65	-	100
Course includes an oral exam with no practical.	25	-	65	10	100
Course includes written exam only	25	-	75	-	100

c. Grading System:

The following Table illustrates the grading system adopted in the Faculty:

Grade expression	Grade scale	Grade point average value (GPA)	Numerical scale marks
EXCELLENT	A+	4	≥ 95%
	A	3.85	90 – < 95%
	A -	3.7	85 - < 90%
VERY GOOD	B +	3.3	82.5 - < 85%
	B	3	77.5 - < 82.5%
	B -	2.7	75 - < 77.5%
GOOD	C +	2.3	72.5 - < 75%
	C	2	67.5 - < 72.5%
	C -	1.7	65 - < 67.5%
SATISFACTORY	D +	1.3	62.5 - < 65%
	D	1	60 - < 62.5%
FAIL	F	0	< 60%
Withdraw	W	-	-
Incomplete	I*	-	-
Absent	Abs E**	-	-

- **Grade point average (GPA):**

❖ The university calculates for each student, both at the end of each grading period and cumulatively.

❖ A grade point average (GPA) based on the ratio of grade points earned divided by the number of credits earned with grades of A-F (including pluses and minuses).

❖ Both the periodic and cumulative GPA appears on each student's record.

❖ The semester GPA of the student is the weighted average of the grade points acquired in the courses passed in that particular semester.

❖ Registration symbols that do not carry grade points or credit:

S: represents achievement that is satisfactory

U: represents achievement that is unsatisfactory

T: Transfer, indicates credit transferred from another institution.

W: withdrawal prior to deadline indicates a student has officially withdrawn from a course.

I*: Students who have satisfactory attendance in the courses but can not attend the final written/oral exams due to an accepted excuse by the faculty council, they can enter the final written/oral exams of the courses in the next semester and their full grade is calculated.

Abs E:** If the student in the above case can not enter the final written/oral exams in the next semester, he should reregister in the course and his full grade is calculated.

7- Failure in courses:

- Student who fails to attend the final written exam.
- Student who fails to achieve 30% of the marks in the final written exam.
- Student who fails to achieve 60% of the total course marks.

8- Regulation for progression and program completion:

- Livery student is required to attend 75% of lectures and laboratory periods continuously.
- Selection of courses for any given years is conditional on the successful completion of the prerequisite courses of the proceeding academic year.
- Student who fails to pass a required course will be allowed to repeat this course
- Student who fails to pass an elective course will be allowed to repeat this course or register for another elective course.

9- Academic difficulty:

- A student who fails to maintain a minimum cumulative GPA of "1" for six consecutive semesters or four a total of ten semesters will be dismissed from the faculty.
- Students are allowed to repeat courses with a grade "d" under supervision of an academic advisor in order to improve their cumulative GPA.
- The higher grade of any repeated course is used in GPA calculations.

10- Graduation:

Students receive Bachelor of Pharmacy (Clinical pharmacy-Pharm D) on completion of:

1. The requisite number of credit hours (176 credit hours + 6 credit hours of university requirments) with a cumulative GPA equivalent to 2 or above
2. Preliminary training: At least 100 hrs. of summer training after 3rd level in community/hospital pharmacy.
3. Advanced training: one academic year (6 rotations through 9 months)
4. Research project in 6th year

11-Evaluation of achievement of program keyelemnts:

Evaluator	Tool
1-Senior students	• Questionnaires • Meetings with bachelor students
2-Alumni	• Questionnaires • Meetings with graduates
3-Stakeholders	• Questionnaires for staff members • Questionnaires for Labor market organizations members & Heads and managers of the business sector

	• Meetings with Labor market organizations members
4-Internal Evaluator	Reviewing
5-External Evaluators	Reviewing
6- Statistics	Students grades Rate of program completion/ graduation Rate of pass/failure
Sample size of questioners = 20% of population	