



University: Kafrelsheikh

#### **Faculty: Pharmacy**

### **Program Specifications**

#### **A-Basic Information**

- 1. *Program title:* Bachelor in Pharmacy (Clinical pharmacy)
- 2. Program type: Single
- 3. Faculty: Faculty of Pharmacy, Kafrelsheikh University
- 4. Departments:
  - 1. Department of Pharmaceutical Chemistry
  - 2. Department of Pharmaceutical Analytical Chemistry
  - 3. Department of Biochemistry
  - 4. Department of Pharmaceutical Technology
  - 5. Department of Pharmacognosy
  - 6. Department of Microbiology& Immunology
  - 7. Department of Pharmacology & Toxicology
  - 8. Department of Clinical Pharmacy
- 5- Coordinator: Prof. Dr. Abdelaziz Elsayed Abdelaziz
- 6- External evaluation: Prof. Dr. Mahmoud Baker Elashmawy
- 7- Program approval date: Approved on 10/9/2016

#### **B-** Professional Information

#### 1. Program Aims:

The aim of this program is to graduate pharmacists with high qualifications, knowledge, and skills in order to:

- 1. Provide adequate health care and medical follow-up for patients inside and outside hospitals in collaboration with other members of the healthcare team.
- 2. Safely and effectively handle chemicals and pharmaceutical products taking into consideration pharmacy law and legalizations.
- 3. Formulate and prepare pharmaceutical products from different sources and participate in systems for dispensing, storing, and distribution of medications.
- 4. Perform various qualitative and quantitative analytical techniques and fulfill criteria for both GLP and GMP to assure the quality of raw materials, procedures and pharmaceutical products.
- 5. Provide information and education services to community and patients about rational use of medications and medical devices.
- 6. Comprehend pathophysiology of diseases and participate in health care team in order to provide the community with sufficient health care and raise their public health concepts.
- 7. Work in hospitals, cancer units, pharmacy, forensic medicine field, industrial, research institutes and biochemical laboratories
- 8. Demonstrate capability of communication skills, time management, critical thinking, problem solving, decision-making, team-working, marketing, promotion, business and computation and numeric skills.
- 9. Perform responsibilities in compliance with legal, ethical and professional rules.
- 10. Encourage continuous self-learning.
- 11. Apply the concepts of clinical pharmacy.

#### 2. Features of the program:

1 - Give the Bachelor of Pharmacy (Clinical pharmacy) and this entitle the student to work in the field of clinical pharmacy, a new trend of pharmacy in the labor market at home and abroad.

2 - Number of students in the program is relatively limited and this provides the best opportunity for students to learn in the lecture halls and in laboratories.

3 - The program provides students the opportunity to use a Guide Academy directs student in scientific, social and psychological affairs.

4 - The student can register for courses in the first semester and may delete or add any courses before the deadline time, taking into account the academic load.

5 - A student after registration can withdraw from the courses without being considered failed (and on time).

6 - A student can register in the summer semester of some courses with a minimum of 4 hours and a maximum of 10 hours.

7 - The program provides students the opportunity for summer training in pharmacies or pharmaceutical companies, 200 hours, and in addition to 200 hours clinical training in one of the teaching hospitals.

8- Allow the student to re-examine the courses with grade (D) in order to improve the GPA and the highest grade is calculated.

#### 3. Intended learning outcomes (ILOs):

#### a) Knowledge and Understanding:

#### Student will acquire in-depth knowledge and understanding on:

Principles of pharmaceutical calculations, formulation, dispensing and manufacturing of medicine in different dosage forms.

Qualitative and quantitative analysis of medicinal plants active constituents as well as the methods of identification, isolation and purification.

**A1.** Principles for quality assurance of raw materials, in-process and final products either from natural or synthetic compounds.

A2. Pharmaceutical legislation and good manufacturing practice.

**A3**. Explain the stability of medicines; evaluation and control of biological, chemical and physical degradation.

A4. Factors contributing in microbial contamination and methods for their control including

sterilization as well as aseptic procedures.

**A5.** Different analytical methods including principles, design, development, validation and good laboratory practice.

A6. Properties of medicinal compounds and their relationship to molecular structure.

Normal and abnormal body function regarding its physiology, biochemistry, nutrition, immunology and pathology.

A7. Principles of biopharmaceutics and pharmacokinetics.

**A8.** Therapeutic uses of medicines including adverse reactions, interactions of medicines and their significance in treatment, the different mechanisms, dosage and pharmacological actions.

**A9.** Different disease states and therapeutic management with respect to pathogenesis, etiology, diagnosis, management and prognosis.

**A10.** Principles of toxicology, drug toxicity profiles and management of substance misuse and abuse and first aid measures.

**A11.** Principles of clinical pharmacy as dispensing, prescribing, rational use of medicine, patient information and pharmacovigilance.

**A12.** Principles of physical, chemical, biology, social, behavioral, environmental and mathematical sciences those are necessary to prepare students to study applied pharmaceutical sciences.

**A13.** Physico-chemical specifications of materials used in preparation of various dosage forms and delivery systems of biologically active molecules.

**A14.** Pharmacological actions of medicines within living systems from the physical, biological, cellular and molecular aspects.

A15. Principles of complementary, alternative and phytotherapy.

**A16.** The role of clinical pharmacist in health care system concerning identifying different types of medication errors, calculating and preparing total parenteral nutrition and IV admixture.

A17. Common medical terms and general sources of drug information and evidence based medicine.

**A18.** Useful knowledge in dealing with poisoning conditions including toxicology of various drugs, gases, heavy metals and poisons from plant and animal origin.

**A19.** Different methods of biological screening and techniques of biological assays that can be used in determination of the potency of many classes of drugs.

A20. Approaches to drug design & development with emphasis on modern techniques.

**A21.** Principles of each unit operation, rationale use of the equipment for a specific application and the factors affecting the different operation processes in pharmaceutical industry.

A22. Bioequivalence studies, dose adjustment and therapeutic drug monitoring and its advantage.

**A23.** Knowledge of different metabolic pathways of macro and micro molecules in the healthy state including steps and regulatory mechanism of these pathways and the related clinical disorders.

**A24.** Principles of management, financial resources, and business marketing and promotional activities in health care.

A25. Principles of proper documentation and drug filing systems.

**A26.** Basis of radiopharmaceuticals and chemotherapy preparation, handling, calculation and dispensing of their doses.

#### b) Intellectual Skills:

**B1.** Apply pharmaceutical knowledge in the formulation of safe and effective different dosage forms and new drug delivery systems.

**B2.** Interpret patient clinical data including patient records within practice setting.

**B3.** Calculate and adjust proper dosages for different individuals with different patient profiles.

**B4.** Interpret and prepare prescriptions and parenteral nutrition.

**B5.** Apply knowledge and critical understanding of essential facts, concepts, principles, and theories on subject areas identified under knowledge and understanding.

**B6.** Recognize and control potential physical and/or chemical incompatibilities that may occur during drug formulation and dispensing.

**B7.** Interpret the meaning of medical terms.

**B8.** Calculate the common pharmacokinetic parameters that can affect the drug plasma concentrations.

**B9.** Integrate patient objective and subjective data to formulate a list of patient drug related problems.

**B10.** Utilize the basics of pharmacology and therapeutics to prepare a list of all possible therapeutic options for the management of various diseases and medical conditions.

**B11.** Predict all possible drug interactions by using different available sources of drug information.

**B12.** Apply the concepts of GMP and GLP guidelines in pharmaceutical manufacture to obtain final product comply with quality specification.

B13. Sketch a QC plan to carry out suitable methods of drug analysis.

**B14.** Select appropriate methods of isolation/synthesis, purification, identification and standardization of active substances from various origins.

**B15.** Apply the modeling and simulation in the design of new drugs targeting new hits.

**B16.** Sketch specific preventive and control measures for infectious spread in the community.

**B17.** Apply the principles of marketing in promoting cost effective pharmacotherapy.

**B18.** Interpret results of biochemical tests including blood, liver and kidney function tests as well as tumor markers.

**B19.** Apply various principles in the characterization and quality control of herbal, biological and pharmaceutical products.

**B20.** Utilize a strategy for preparation, handling, and dispensing of radiopharmaceuticals.

**B21.** Select a therapeutic plan for special patient population including pediatrics, geriatrics and pregnant women.

#### c) Professional and Practical Skills:

C1. Analyze and correlate between different drug classes.

C2. Isolate and identify active constituents of different medicinal plants.

**C3.** Manufacture, label, store, manage product life cycle and make marketing plan for different pharmaceutical products.

**C4.** Correlate between information from other health professionals, medical records, pharmacy records and appropriate medical literature to use this information to provide rational medication use.

**C5.** Advise effectively the patient on dosage, food regimen, side effects of the drugs and drug interaction.

**C6.** Select suitable OTC drug for patient taking in consideration the history of patient.

**C7.** Use effectively the common medical terms in presenting and describing the patient condition in the pharmacist notes.

**C8.** Formulate therapeutic plan and recommend the drug of choice in different diseases for individual patient based on the available information.

**C9.** Assess the therapeutic effectiveness and adverse effects of drugs for each individual patient.

C10. Conduct patient counseling to teach the patients about their medications.

**C11.** Use effectively the available drug information sources in answering drug information request.

C12. Handle and dispose chemicals safely especially some dangerous ones.

**C13.** Apply preventive measures for different microbial diseases. Perform gram stains, isolate colonies and/or plaques, maintain pure cultures using biochemical test media and record accurately the microscopic observations.

**C14.** Analyze the type of poisoning in different biological samples by different analytical procedures and evaluate the toxic effects of poisons on different organs.

C15. Apply different pharmaceutical operations.

**C16.** Conduct library and experimental research, retrieve information, analyze and interpret experimental results.

C17. Employ proper documentation and drug filing systems.

C18. Synthesize, purify and identify active substances from different origins.

C19. Maintain public awareness on rational use of drugs, vaccination and drug abuse and

misuse.

C20. Compare between different cancer types, their etiology, complications and prognosis.C21. Use effectively herbal medicines, complementary and alternative medicine in the treatment of different diseases.

#### d) General and Transferable Skills:

**D1.** Retrieve and evaluate information from a variety of sources, including libraries, databases and internet.

D2. Work independently or as a part of team in different pharmaceutical fields.

D3. Implement oral and written communication skills.

D4. Communicate effectively with other health care professionals as drug expert.

**D5.** Appraise the pharmacy profession by coping with the new development in the profession and providing the different clinical pharmacy services.

**D6.** Construct mathematical calculations, statistical analysis, computing as well as using the most reputable internet medical information sources to extract the desired information.

**D7.** Implement the laws, legalization and ethics of pharmacy to control the behavior of pharmacist and those who work in the medical field.

D8. Implement good selling, financial, stock management and negotiation skills.

D9. Demonstrate creativity and time management skills.

D10. Implement and appraise writing and presentation skills.

**D11.** Demonstrate and plan critical thinking, problem solving and decision-making abilities.

#### 5- Academic Standards compared with 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 nod GMP 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 radiolabeled 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 equipment 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.

### <u>Coverage of Academic Reference Standards by the Faculty of</u> <u>Pharmacy- Clinical Pharmacy Program ILOs</u> <u>a) Knowledge and Understanding</u>

2	NARS	Program ILOs
2.1	Principles of basics, pharmaceutical, medical,	A1, A15
	social, behavioral, management, health and	
	environmental science as well as pharmacy practice	
2.2	Physicochemical properties of various substances	A16, A5
	and active ingredients as well as biotechnology and	
	radiolabeled products.	
2.3	Principles of different analytical techniques using	A7
	GLP guidelines and validation procedure.	
2.4	Principles of isolation, synthesis, purification,	A2, A3
	identification and standardization methods of	
	pharmaceutical products.	4 0 4 <b>00</b>
2.5	Principles of drug design, development and	A8, A23
26	Synthesis. Properties of different phermacoutical desage form	A16 A20
2.0	including novel drug delivery systems	A10, A23
2.7	Principles of various instruments and techniques	A24
	including sampling, manufacturing, packaging,	
	labeling, storing and distribution processes in	
	pharmaceutical industry.	
2.8	Principles of pharmacokinetics and	A10, A25
	biopharmaceutics with applications in therapeutic	
	drug monitoring, dose modification and	
2.9	Principles of hospital pharmacy including iv	Δ19
2.7	admixture. TPN and drug distribution system.	
2.10	Principles of public health issues including sources	A6
	and control of microbial contamination as well as	
	sanitation, disinfection, sterilization methods and	
	microbiological QC of pharmaceutical products.	
2 1 1	Dringinlag of body functions in boolth and disages	AQ A26
2.11	states as well as basis of genomic and different	A9, A20
	biochemical pathways regarding their different	
	correlation with different diseases.	
2.12	Etiology, epidemiology and laboratory diagnosis	A12
	and clinical features of different disease and their	
	pharmacotherapeutic applications	
2.13	Pharmacological properties of drugs including	A11, A17
	contraindications ADRs and drug interactions	
2.14	Principles of clinical pharmacology	A14 A20
<b>_</b> ,17	pharmacovigilance and rational use of the drugs.	
2.15	Basis of complementary and alternative medicine.	A18
2.16	Toxic profile of drugs and other xenobiotics	A13, A21
	including sources, identification, symptoms,	

	management control and first aid measures.	
2.17	Methods of biostatistical analysis and	A22
	pharmaceutical calculations.	
2.18	Principles of management including financial and	A27
	human resources.	
2.19	Principles of drug promotion, sales and marketing,	A27
	business administration, accounting and	
	pharmacoeconomics.	
2.20	Principles of proper documentation and drug filling	A28
	systems.	
2.21	Regulatory affairs, pharmacy laws and ethics of	A4
	health care and pharmacy profession.	

# **b) Intellectual Skills**

4	NARS	<b>Program ILOs</b>
4.1	Apply pharmaceutical knowledge in the formulation	B1, B4, B20
	of safe and effective medicines as well as in dealing	
10	with new drug delivery systems.	D10
4.2	Comprehend and apply GLP, GMP, GSP, and GCP	B12
13	Apply quantitative and qualitative analytical and	P12
4.5	hiological methods for OC and assay of raw	<b>D</b> 15
	materials as well as pharmaceutical preparations.	
4.4	Recognize and control possible physical and / or	B6
	chemical incompatibilities that may occur during	
	drug dispensing.	
4.5	Select the appropriate method of isolation, synthesis,	B14
	purification, identification, and standardization of	
16	active substances from different origin.	D15
4.6	Apply the principles of bioinformatics and computer	B12
47	Apply various principles to determine characteristics	B10
/	of biopharmaceutical products.	
4.8	Select and assess appropriate methods of infection	B16
	control to prevent infections and promote public	
	health.	
4.9	Utilize the pharmacological basis of therapeutics in	B7, B10, B21
	the proper selection and use of drugs in various	
4 10	disease conditions.	D2 D0
4.10	Calculate and adjust dosage and dose regimen of	B3, B8
4 11	Assess drug interactions ADRs and	R9 R11
	pharmacovigilance.	<i>Dy</i> , <i>D</i> 11
4.12	Apply the principles of pharmacoeconomics in	B17
	promoting cost / effective pharmacotherapy.	
4.13	Analyze and interpret experimental results as well as	B5, B18
	published literature.	
4.14	Analyze and evaluate evidence-based information	B2
1	needed in pharmacy practice.	

3	NARS	Program ILOs
3.1	Use the proper pharmaceutical and medical terms,	C7
	abbreviations and symbols in pharmacy practice.	
3.2	Handle and dispose chemicals and pharmaceutical	C12
	preparation safely.	
3.3	Compound, dispense, label, store and distribute	C3
	medicines effectively and safely.	
3.4	Extract, isolate, synthesize, purify, identify, and / or	C2, C18
	standardize active substances from different origin.	
3.5	Select medicines based on understanding of	C4, C6, C8, C20,
	etiology and pathophysiology of disease.	C21
3.6	Monitor and control microbial growth and carry out	C13
	laboratory tests for identification of infectious and	015
	noninfectious diseases.	
3.7	Assess toxicity profiles of different xenobiotics and	C14
	detect poisons in biological samples.	
3.8	Apply techniques used in operating pharmaceutical	C15
	equipment and instruments.	
3.9	Maintain public awareness on rational use of drugs	C19
	and social health hazards of drug abuse and misuse.	
3.10	Advise patients and other healthcare professional	C5, C10, C11, C21
	about safe and proper use of medicines.	
3.11	Conduct research studies and analyze the results.	C16
3.12	Employ proper documentation and drug filling	C17
	systems.	

# c)Professional and Practical Skills

# d)General and Transferable Skills

5	NARS	<b>Program ILOs</b>
5.1	Communicate clearly by verbal and written means.	D3, D4
5.2	Retrieve and evaluate information from different	D1
	sources to improve professional competencies.	
5.3	Work effectively in a team.	D2
5.4	Use numeracy calculation and statistical methods as	D6
	well as information technology tools.	
5.5	Practice independent learning needed for continuous	D5
	professional development.	
5.6	Adopt ethical, legal and safety guidelines.	D7
5.7	Develop financial, sales and market management	D8
	skills	
5.8	Demonstrate creativity and time management	D9
	abilities.	
5.9	Implement writing and presentation skills.	D10
- 10		
5.10	Demonstrate critical thinking, problem-solving and	D11
	decision-making abilities.	

### Comparison Between NARS Curriculum Structure and Faculty of Pharmacy-Clinical Program, Curriculum Structure

NARS		Faculty of Pharmacy		
Sciences	Subjects	Sciences	Subjects	
Basic 10-15%	Physical, organic and analytical chemistry, biology, biophysics, computer science, mathematics.	Basic 12.69% (25/197)	Physical and inorganic chemistry, Pharmaceutical Organic Chemistry-1,2,3, Pharmaceutical Analytical Chemistry- 1,2, Biophysics, Mathematic and statistics, Computer sciences, English language, Cell biology	
Pharmaceutical 35-40%	Pharmaceutical 35-40%Pharmacy Orientation, Medical & Pharmaceutical Terminology, Pharmaceutics, Physical Pharmacy, Industrial Pharmacy, Industrial Pharmacy, Pharmaceutical Technology, Biopharmaceutics, Pharmaceutical Chemistry, Pharmaceutical Chemistry, Pharmaceutical Microbiology, Molecular biology, Pharmaceutical Biotechnology, Quality Assurance and Quality Control, Instrumental Analysis, Biological Drug Assay.		Pharmacy Orientation, Medical Terminology, Physical Pharmacy, Pharmaceutical Technology, Pharmaceutical Dosage Form-1,2, Radio-pharmaceutics, Controlled Drug Delivery System, Biopharmaceutics and Pharmacokinetics, Clinical Pharmacokinetics, Pharmaceutical Analysis and Quality Control, Pharmacy Administration, Pharmacognosy-1,2, Phytochemistry1,2, Medicinal Chemistry- 1,2, Pharmaceutical Microbiology, Pharmaceutical Biotechnology, Quality Control of Herbal Drugs, Instrumental Analysis.	

NA	RS	Faculty of Pharmacy		
Sciences	Subjects	Sciences	Subjects	
Medical 20-25%	Anatomy, Histology, Physiology, Pathology, Biochemistry, Parasitology, Pharmacology, Clinical Pharmacology, Therapeutics, Medical Microbiology, Immunology and Virology.	Medical 21.8% (43 hr/197hr)	Anatomy, Histology, Physiology, Pathology, Biochemistry-1,2, Parasitology, Pharmacology- 1,2, Clinical Pharmacology, Therapeutics-1,2, General Microbiology and Immunology, Clinical Biochemistry, Pathophysiology, Clinical Microbiology.	
Pharmacy Practice 10-15%	Pharmaceutical Care and Professional Pharmacy, (Clinical, Hospital, Community etc), Complementary and alternative medicine, Drug and poison Information, Pharmacy Laws and regulations.	Pharmacy Practice 25.88% (51hr/197)	Clinical Pharmacy-1,2, Hospital Pharmacy, Drug Information, Pharmacy Legislation, Community Pharmacy Practice, Drug Interaction. Clinical Pharmacy-1,2, Clinical Nutrition, Oncology, Treatment of Dermatological and Reproductive Diseases, Treatment of Pediatric Diseases, Treatment of Cardiovascular System Disease, Treatment of Respiratory System disease, Gastroenterology, Phytotherapy	
Health and Environmental 5-10%	Public Health, Egyptian health system and its policies, Biostatistics, Healthy Life Style, Toxicology, Forensic Medicine, First Aid and Emergency Medicine	Health and Environmental 5.1% (10hr/197hr)	Public Health and Preventive Medicine, Toxicology and Forensic Medicine, Tromas and First Aid	

NARS		Faculty of Pharmacy		
Sciences	Subjects	Sciences	Subjects	
Behavioral and	Psychology,	Behavioral and	Psychology,	
Social	Communications,	Social	Sociology.	
2-4%	Social and	1.5%		
	administrative	( <b>3hr/197hr</b> )		
	pharmacy, Pharmacy			
	Ethics.			
Discussion	Calas Madating 1	Dhaarraa	Dura Madaati	
Pharmacy	Sales, Marketing and	Pharmacy	Drug Marketing	
management	Drug Promotion,	management		
2-4%	Pharmaceutical	0.5%		
	Business	(1hr/197hr)		
	Administration,			
	Pharmacoeconomics.			
Discretionary	Professional and Non-	Discretionary	Elective Courses	
Up to 8%	Professional Sciences	4.56 %		
		(9hr/197hr)		
Pharmacy Training	Not less than 300hr in a	Pharmacy Training	200 hrs in a	
	pharmaceutical		pharmaceutical	
	location.		location.	
			100 hrs in teaching	
			hospital	
			×.	

#### **C- Program Structure**

The Bachelor of Pharmacy program can be completed in five years (ten semesters) of fulltime study. It provides education in the biological, chemical and physical sciences together with professional instruction on material that is specific to the practice of pharmacy. The program is structured into two semesters each year, each semester made up of 15 weeks. An optional 6 to 8 weeks summer semester is also offered.

The Faculty of Pharmacy implements the credit hours system. A credit hour represents an hour of lectures (L) or two hours of practical or tutorial (P/T) classes a week for a period of 15 weeks.

#### **1. Learning and Teaching Concepts**

The Bachelor of Pharmacy program is designed to integrate the teaching, learning and understanding of pharmaceutical science in the context of pharmacy practice. The program is delivered through lectures, practical classes, group tutorials, seminars, research, assignments and external cooperation with the community and industry.

#### 2. Courses Registration

Academic advisers are available to help students choose the required courses from the list of the offered courses. Selection of courses for any given year is conditional on the successful completion of the prerequisite courses of the preceding academic year.

#### 2.1. Course Load

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

- The academic load in each semester ranges from 12 to 22 credit hours.
- The academic load in the summer semester ranges from 4 to10 credit hours.
- Credits acquired by the student are those of passed courses from the registered academic load.

#### 2.2. Add, Drop and Withdrawal

Students are allowed to add or drop a course or more during a specified time every semester. Students are allowed to withdraw from a course prior to a deadline set by the university. The course will carry a grade of "W" and students will be allowed to retake

the course when available. Students who withdraw after the deadline will not be allowed to sit for the relevant exam and will carry a grade of "F" for that course.

#### 2.3. Attendance

Students are expected to attend the university on a full-time basis during each semester. Attendance is checked during seminars, tutorials and labs. Students must attend at least 75% of the Lectures and practical labs. If absence in a course exceeds the allowed percentage (25%) during the first ten weeks of the semester (either excused or unexcused), the student will not be allowed to sit for the exam of the relevant subject and will carry grade of "F".

#### 2.4. Language of Instruction

English is the official language of instruction; all communication, lectures, coursework, and documentation are performed using the English language.

#### 3. Summer training

Every student should complete at least 200 hours of training in pharmacy settings such as community or hospital pharmacies, pharmaceutical firms or research institutes and universities and further 100 hours of clinical training in a teaching hospital. Students commence training after the end of the fourth semester.

#### 4. Admission policy

The faculty complies with the admission regulations and requirements of the Egyptian Supreme Council of Universities (ESCU). Accordance with pharmacy student wishes, students are enrolled in the clinical program, faculty of pharmacy, Kafrelsheikh university based on the allowed number to be enrolled in this program. If a huge number of students applied for this program, we choose the required number of students based on exam result.

#### 5. Assessment

Student's performance is assessed by both coursework and examinations. Exams are held at the end of each course. Methods of assessment include written, oral and practical examinations, research papers, course assignments and practical work.

#### 5.1. Grading Scheme:

1. Grades are a measure of the performance of a student in an individual course.

Grade Expression	Grade Scale	Grade Point Average Value* (GPA)	Numerical Scale of Marks
Excellent	А	4	≥ 90 %
Excellent	A-	3.7	85 - < 90 %
	B+	3.3	82.5 - < 85 %
Very Good	В	3	77.5 - < 82.5 %
	B-	2.7	75 - < 77.5 %
	C+	2.3	72.5-<75 %
Good	С	2	67.5 - < 72.5 %
	C-	1.7	65-<67.5 %
Satisfactory	D+	1.3	62.5 - < 65 %
Saustactory	D	1	60-<62.5 %
Fail	F	0	< 60 %

- a. \* The grade point values above apply to marks earned in individual courses; grade point averages are weighted sums of the grade points earned.
- 2. 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. Repeated courses will be counted once toward the calculation of accumulated credit hours. The best-achieved GPA will be used for calculating GPA. The cumulative GPA calculation starts from the first semester for each student and is updated each semester till his/her graduation. The semester GPA of the student is the weighted average of the grade points acquired in the courses passed in that particular semester.

- 3. The Board of Examiners will review and approve all final grades. The Board of Examiners is to be advised of any adjustment made and the reason for doing. This pertains to grades adjusted for the overall class. (Any adjustments made for individual students should be considered on an individual basis at Board of Examiners
- 4. Final grades shall not be reported or released to students as official until they are approved by the Faculty Council.

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

• I: Incomplete: a temporary grade that indicates course work has not been completed. The instructor assigns "I" when, due to extraordinary circumstances, the student was prevented from completing coursework on time.

• S: Represents achievement that is satisfactory.

• T: Transfer, indicates credits transferred from another institution.

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

#### 6. Progression of students

The student cannot progress to the next course without having passed its pre-requisite courses.

#### 7. Failure in courses

- Students who fail to attend the final exam.
- Students who fail to achieve 30 % of the marks in the final written exam.
- Students who fail to achieve 60% of the total marks.

Students are allowed to submit grade appeals to the registrar office requesting the rechecking of the total grade from the records available as well as confirming that the examiner has not missed any questions during the grading of the answer sheet.

#### 8. In complete grade

If a student fails to attend the final exam for any emergency or exceptional circumstances, the University President may approve an incomplete "I" grade. Course work grades are transferred to students who are given an "I" grade. Students must complete the course requirements within one year of the final examination of the following term of enrolment, If not submitted by that time; the "I" will automatically change to an "F".

#### 9. Academic difficulty

A student who fails to maintain a minimum cumulative GPA of "1" for six consecutive semesters or for a total of ten semesters will be dismissed from the faculty.

Students are allowed to repeat courses with a grade of D and F under the supervision of an academic advisor in order to improve their cumulative GPA. The higher grade of any repeated course is used in the GPA calculation.

#### **10. Leave of absence**

Students may apply for a leave of absence.

• Students granted a leave of absence of two continuous semesters or less are required to meet only those graduation requirements for their original graduating class.

• Students granted a leave of absence of more than two continuous semesters or more than one leave of absence of two continuous semesters or less, must meet the graduation requirements in effect at the time of graduation.

### 11. Graduation

Students receive the Bachelor in Pharmacy (Clinical Pharmacy) degree upon completion of:

1. The requisite number of credit hours (197 credit hours) with a cumulative GPA equivalent to 1 or above.

2. At least 200 hours of training in pharmacy setting.

3. At least 100 hours of clinical training in teaching hospital

### 12. Academic integrity

Any form of cheating, plagiarism, falsification, impersonation, evidence of concealment or fabrication of results are resisted and opposed by the University.

The minimum penalty for such cases is failing the course where this offence was committed. In some cases, the penalty may reach dismissal from the University for one semester or more based on the circumstances of the case.

### 13. Study plan

The Bachelor degree of Pharmacy is granted to students who successfully complete a minimum of 197 credit hours divided as follows:

University requirements: 9 credit hours.

Faculty requirements: 182 credit hours.

Elective courses: 9 credit hours.

And at least 200 hours (100 hr.) of training in pharmacy setting and at least 100 credit

hours of clinical training in a teaching hospital

### **Key for Course Abbreviations**

CPS 000	Computer Science
EN	English language
HU	Humanities
MS	Mathematics
PB	Biochemistry
PC	Chemistry
PG	Pharmacognosy
PM	Microbiology and Immunology
PO	Pharmacology and Toxicology
PP	Pharmacy Practice
PT	Pharmaceutics and Pharmaceutical Technology
MD	Medical Courses

a. The Letter 'P' means that the courses are offered to students of Pharmacy only.

- b. The first digit represents the semester number.
- c. The second and third digits represent the course number.

Course	Course Title	Credit Hours*			
Code	Course Thie	L	P/T	Total	
CP 101	Computer Science	1	1	2	
EN 101	English Language	2	-	2	
HU 201	Human Right	2	-	2	
HU 302	Psychology	2	-	2	
HU 903	Sociology	1		1	
Total		8	1	9	

### **13.1.** University Requirements

L: Lecture; P/T: Practical or tutorial.

### 13.2.Faculty Requirements: See program curriculum

### **13.3.Elective Courses**

The faculty of Pharmacy offers elective courses from which the students are free to select six credits.

Course	Course Title		Credit Hours		
Code	Course Thie	L	Р	Total	
PC E11	Drug Design	2	1	3	
PC E12	Advanced Pharmaceutical Analysis -Spectroscopy	2	1	3	
PG E8	Alternative Medicinal Therapies	2	1	3	
PG E9	Production & Manufacture of Medicinal plants	2	1	3	
PG E10	Chromatography and Separation Techniques	2	1	3	
PT E10	Quality Assurances and GMP	2	1	3	
PT E11	Applied Industrial Pharmacy	2	1	3	
PT E12	Good Manufacturing practices	2	1	3	
PT E13	Cosmetic Preparations	2	1	3	
PM E5	Biological Standardization	2	1	3	
PM E6	Antimicrobial Agents	2	1	3	
PO E9	Veterinary Pharmacology	2	1	3	

### **14. PROGRAM CURRICULUM**

### Table (1)

Semester (1)

Course Title	Course	C	Credit ho	urs		Examination Marks				Total.	Final Exam
Course little	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr.	Oral	marks	(hrs)
Physical & Inorganic Chemistry	PC 101	2	1	3	Registration	10	25	65	-	100	2
Pharmaceutical Organic Chemistry -1	PC102	2	1	3	Registration	10	25	50	15	100	2
Biophysics	MD101	1	1	2	Registration	10	25	65	-	100	1
Botany and medicinal plants	PG 101	2	1	3	Registration	10	25	50	15	100	2
Cell Biology	MD 102	1	1	2	Registration	10	25	65	-	100	1
Mathematics and statistics	MS 101	2	-	2	Registration	10	-	90	-	100	2
Computer sciences	CS 101	1	1	2	Registration	10	25	65	-	100	1
English language	EN 101	2	-	2	Registration	10	-	90	-	100	2
Total		13	6	19						800	

**Examination Marks:** 

Period = Periodical Exam.

Pract. = Practical Exam.

Wr.= Written Exam.

## Table (2)

## Semester (2)

Course Title	Course	C	redit hou	irs		Examination Marks				Total	Final Exam.
	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr.	Oral	marks	(hrs)
Pharmaceutical Organic Chemistry-2	PC203	2	1	3	Pharmaceutical organic chemistry -1	10	25	50	15	100	2
Pharmaceutical Analytical Chemistry-1	PC205	2	1	3	Registration	10	25	50	15	100	2
Pharmacognosv -1	PG 202	2	1	3	Botany and medicinal plants	10	25	50	15	100	2
Histology	MD 203	2	1	3	Registration	10	25	65	-	100	2
Physical pharmacy	PT 201	2	1	3	Registration	10	25	50	15	100	2
Pharmacy orientation	PT 202	2	-	2	Registration	10	-	90	-	100	2
Human rights*	HU 201	2	-	2	Registration	10	-	90	-	100	2
Total	1	14	5	19	1	I	1	1	1	700	

## Table (3)

## Semester (3)

Course Title	Course	Credit hours					Examination Marks				Final
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr.	Oral	marks	exam. (hrs)
Pharmaceutical Organic chemistry-3	PC 304	2	1	3	Pharmaceutical organic chemistry-1	10	25	50	15	100	2
Pharmaceutical Analytical Chemistry-2	PC 306	2	1	3	Pharmaceutical analytical chemistry- 1	10	25	50	15	100	2
Pharmacognosy -2	PG 303	2	1	3	Botany and medicinal plants	10	25	50	15	100	2
Anatomy	MD 304	1	1	2	Registration	10	25	65	-	100	1
Physiology	MD 305	3	1	4	Registration	10	25	65	-	100	3
Medical Terminology	EN 302	2	-	2	Registration	10	-	90	-	100	2
Psychology	HU 302	2	-	2	Registration	10	-	90	-	100	2
Total		14	5	19						700	

# Table (4)

## Semester (4)

Course Title	Course	C	redit hou	irs		E	xaminati	Max	Final		
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr	Oral	marks	exam. (hrs)
Biochemistry -1	PB 401	2	1	3	Registration	10	25	50	15	100	2
Phytochemistry -1	PG 404	2	1	3	Pharmacogosy-1	10	25	50	15	100	2
Instrumental Analysis	PC 407	1	1	2	Registration	10	25	50	15	100	1
General Microbiology and Immunology	PM 401	3	1	4	Registration	10	25	50	15	100	3
Parasitology	MD 406	1	1	2	Registration	10	25	50	15	100	1
Pharmaceutical dosage forms-1	PT 403	2	1	3	Physical pharmacy	10	25	50	15	100	2
Pharmacy legislation	PT 404	1	-	1	Registration	10	-	90	-	100	1
Total		12	6	18						700	

## Table (5)

## Semester (5)

	Course	Credit hours				E	xaminati	Max.	Final		
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr.	Oral	marks	exam. (hrs)
Medicinal Chemistry-1	PC 509	2	1	3	Pharmaceutical organic	10	25	50	15	100	2
					Chemistry-3						
Clinical microbiology	PM 502	2	1	3	General microbiology & immunology	10	25	50	15	100	2
Pharmaceutical dosage forms-2	PT 505	2	1	3	Physical pharmacy	10	25	50	15	100	2
Biochemistry-2	PB 502	2	1	3	Biochemistry -1	10	25	50	15	100	2
Phytochemistry-2	PG 505	2	1	3	Pharmacognosy -1	10	25	50	15	100	2
Pathophysiology	MD 507	2	-	2	Physiology	10	-	75	15	100	2
Pharmacy Administration	PT 506	2	-	2	Registration	10	-	90	-	100	2
Total		14	5	19						700	

## Table (6)

### Semester (6)

Course Title	Course	C	redit hou	irs		E	xaminati	S	Max.	Final	
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr	Oral	marks	exam. (hrs)
Medicinal chemistry-2	PC 610	2	1	3	Medicinal chemistry-1	10	25	50	15	100	2
Pharmaceutical technology	PT 607	2	1	3	Registration	10	25	50	15	100	2
Community pharmacy practice	PT 608	2	1	3	Registration	10	25	50	15	100	2
Biopharmaceutics and pharmacokinetics	PT 609	2	1	3	Pharmaceutical dosage forms-1	10	25	50	15	100	2
Quality Control of Herbal Drugs	PG 606	2	1	3	Pharmacognosy -1	10	25	50	15	100	2
Pathology	MD 608	2	1	3	Registration	10	25	50	15	100	2
Tromas and First Aid	MD 609	2	-	2	Registration	10	-	75	15	100	2
Total		14	6	20						700	

## Table (7)

## Semester (7)

Course Title	Course	C	redit hou	irs			xaminati	Max. F	Final		
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr	Oral	marks	exam. (hrs)
Pharmacology -1	PO 701	2	1	3	Physiology	10	25	50	15	100	2
Radiopharmaceuticals	PP 701	1	-	1	Registration	10	-	90	-	100	1
Clinical pharmacy -1	PP 702	2	1	3	Registration	10	25	50	15	100	2
Hospital pharmacy	PP 703	2	1	3	Registration	10	25	50	15	100	2
Controlled drug delivery system	PT 704	2	-	2	Pharmaceutical dosage forms-1	10	-	75	15	100	2
Public health and preventive medicine	MD 710	2	-	2	Clinical Microbiology	10	-	75	15	100	2
Pharmaceutical Biotechnology	PM 703	2	1	3	Registration	10	25	50	15	100	2
Pharmaceutical Microbiology	PM 704	2	1	3	Registration	10	25	50	15	100	2
Total		15	5	20						800	

## Table (8)

## Semester (8)

Course Title	Course	C	redit hou	irs		E	xaminati	(S	Max.	Final	
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr.	Oral	marks	exam. (hrs)
Pharmacology-2	PO 802	2	1	3	Pharmacology-1	10	25	50	15	100	2
Clinical pharmacy -2	PP 805	2	1	3	Clinical pharmacy-1	10	25	50	15	100	2
Phytotherapy	PG 807	2	1	3	Pharmacognosy -1	10	25	50	15	100	2
Pharmaceuticals analysis and quality control	PC 808	2	1	3	Pharmaceutical Analytical chemistry1	10	25	50	15	100	2
Clinical biochemistry	PB 803	2	1	3	Biochemistry-1	10	25	50	15	100	2
Drug marketing	PP 806	1	-	1	Registration	10	-	90	-	100	1
Drug interactions	PO 803	2	-	2	Pharmacology -1	10	-	75	15	100	2
Elective course	PE	2	1	3	Registration	10	25	50	15	100	2
Total		15	6	21						800	

## Table (9)

## Semester (9)

Course Title	Course	C	redit hou	irs		E	xaminati	Mov	Final		
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period.	Pract.	Wr.	Oral	marks	exam. (hrs)
Toxicology and forensic chemistry	PO 904	2	1	3	Pharmacology -1	10	25	50	15	100	2
Therapeutics -1	PO 905	2	1	3	Pharmacology-1	10	25	50	15	100	2
Clinical pharmacokinetics	PP 907	2	1	3	Biopharmaceutics and pharmacokinetics	10	25	50	15	100	2
Oncology	PP 908	2	1	3	Pathology & pharmacology-1	10	25	50	15	100	2
Clinical nutrition	PP 909	1	1	2	Biochemistry-1	10	25	50	15	100	1
Clinical pharmacology	PO 906	2	1	3	Pharmacology -1	10	25	50	15	100	2
Sociology	HU 903	1	-	1	Registration	10	-	90	-	100	2
Elective course	PE	2	1	3	Registration	10	25	50	15	100	2
Total		14	7	21						800	

## **Table (10)**

### Semester (10)

	Course	C	redit hou	irs		Ex	aminatio	KS	– Max.	Final	
Course Title	code	Lect.	Pract.	Total	Prerequisite	Period	Pract.	Wr	Oral	marks	exam. (hrs)
Therapeutics -2	PO 007	2	1	3	Pharmacology -1	10	25	50	15	100	2
Treatment of dermatological and reproductive diseases	PP 010	1	1	2	Pathology & pharmacology-1	10	25	50	15	100	1
Treatment of Pediatrics diseases	PP 011	2	1	3	Pathology & pharmacology-1	10	25	50	15	100	2
Treatment of Cardiovascular diseases	PP 012	2	1	3	Pathology & pharmacology-1	10	25	50	15	100	2
Gastroenterology	PP 013	2	1	3	Pathology & pharmacology-1	10	25	50	15	100	2
Treatment of Respiratory system diseases	PP 014	2	1	3	Pathology & pharmacology-1	10	25	50	15	100	2
Drug information	PP 015	1	-	1	Pharmacology -1 & Clinical pharmacy -1	10	-	75	15	100	2
Elective course	PE	2	1	3	Registration	10	25	50	15	100	2
Total		14	7	21						800	