توصيف برنامج مرحلة البكالوريوس

(لائحة 2012)

كلية الصيدلة

جامعة كفرالشيخ

Program Specification

University: Kafrelsheikh **Faculty: Pharmacy**

Program Specifications

A- Basic Information

1. ***Programme title:*** Bachelor degree in Pharmacy (BSc. Pharm.)
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 and Immunology.
    7. Department of Pharmacology & Toxicology.
    8. Department of Clinical Pharmacy.

5- Coordinator: Prof. Dr. Ramadan Ahmed Eldomany

6- External evaluation: Prof. Dr. Mahmoud Bakr Elashmawy

7- Program approval date: 2/6/2016

B- Professional Information:

1. ***Program Aims:***

The aim of this program is to prepare graduates with attributes described in the National Academic Reference Standards (NARS). In order to achieve this aim, the following objectives have to be fulfilled:

1. Safely and effectively handle chemicals and pharmaceutical products taking into consideration pharmacy law and legalizations.
2. Formulate and prepare pharmaceutical products from different sources and participate in systems for dispensing, storing and distribution of medications.
3. 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.
4. Provide information and education services to community and patients about rational use of medications and medical devices.
5. 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.
6. Work in hospitals, cancer units, pharmacy, forensic medicine field, industrial, research institutes and biochemical laboratories
7. Demonstrate capability of communication skills, time management, critical thinking, problem solving, decision-making, team-working, marketing, promotion, business, computation and numeric skills.
8. Perform responsibilities in compliance with legal, ethical and professional rules.
9. Have practical and theoretical knowledge of drug design, SAR and other aspects of pharmaceutical chemistry.
10. Give knowledge in the biology of microorganisms and their attribution to infectious diseases and apply this in research and practical work in controlling microbial infections, epidemiology and public health issues.
11. Have knowledge and skills in pharmacology, screening and bioassay of drugs as well as toxicology of xenobiotics.
12. Be a life-long learner, creative researcher and effective participant in the healthcare of the community.

2. ***Intended learning outcomes (ILOs):***

a) Knowledge and Understanding:

Student will acquire in-depth knowledge and understanding on:

a1- Principles of physical, chemical, biological, social, behavioral and environmental sciences that are necessary to prepare student to study applied pharmaceutical sciences.

a2- Physico-chemical specifications of various substances used in preparation of medicines including inactive and active ingredients as well as biotechnology and radio-labeled products.

a3- Analytical methods including principles, procedures, development, validation and applications under good laboratory practice.

a4-Basic methods of extraction, isolation, purification, identification and standardization of pharmaceutical compounds.

a5- The structure activity relationship of different molecules that approach drug design and discovery.

a6- The knowledge of organic chemistry that is required for the synthesis of pharmacologically active compounds.

a7-Basis of pre-formulation, stability and formulation of different pharmaceutical dosage forms as well as drug delivery systems.

a8-Basis of configuration, function and operation of equipment used in pharmaceutical industry.

a9-Different techniques in pharmaceutical processes including manufacturing, packaging, labeling, storage and distribution of pharmaceutical products and medical devices.

a10-Principles of pharmacokinetics and bio-pharmaceutics, including their importance in dosage form design, therapeutic drug monitoring, dosage tailoring and bioequivalence studies.

a11- Principles of hospital pharmacy including dispensing, distribution, patient profiles, adverse effects and reporting as well as counseling of in/outpatient and medical staff members.

a12-Principles of total parentral nutrition and I.V. admixtures and use of medical devices.

a13- Basis of general and pharmaceutical microbiology including different types of micro-organisms, sources of microbial contamination, types of biocides and disinfectants, methods of sterilization and microbiological quality control of pharmaceutical products.

a14- Basic knowledge of medical sciences relevant to pharmacy practice and pharmaceutical sciences such as anatomy, physiology, histology of human body as well as etiology and epidemiology of diseases.

a15- 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.

a16- Understanding the clinical picture, laboratory diagnosis, treatment, prevention and control of infectious and parasitic diseases and other issues related to public health.

a17- Basics of molecular biology and its applications in the pharmaceutical field.

a18- Pharmacological profile of medicines including mechanism of action, dosing, adverse reactions and interactions of medicines.

a19- Introductory knowledge for practicing pharmacy including basics of drug information services, proper documentation, filing systems, information about medication errors.

a20-Basis of herbal and alternative medicine including uses, dosage, safety and manufacture of herbal medicines.

a21- Useful knowledge in dealing with poisoning conditions including toxicology of various drugs, gases, heavy metals, and poisons from plant and animal origin.

a22- Biological evaluation, screening of drugs, methods of biostatistical analysis and pharmaceutical calculation.

a23- Knowledges that are important for management of pharmaceutical institutions including promotion, sales and marketing of medicines.

a24- The laws related to pharmacy and medicines, ethics of health care, regulatory affairs and proper documentation.

a25-Principles of immunological response to xenobiotics and pathogens, including concepts of vaccination and treatment of immunological disorders.

a26-Basis of clinical pharmacology, therapeutics and rational use of drugs.

b) Intellectual Skills:

By the end of this program the student will be able to:

b1- Design and formulate safe and effective pharmaceutical dosage forms and new drug delivery systems.

b2- Convert chemical structures of drugs and its chemical precursors to names according to IUPAC and other systems.

b3- Predict chemical and physical interactions that contribute to drug binding including prerequisite reaction mechanisms.

b4- Utilize statistical data of biological and chemical experiments to evaluate quality and benefits of drugs.

b5- Utilize principles of therapeutics such as disease etiology, patho-physiology, investigation and prognosis in selection of suitable medication in disease management.

b6- Tailor and adjust dosage regimens depending on pharmacokinetic and clinical pharmacology rationale.

b7- Evaluate drug-induced disorders and drug interactions including food, disease or environmental interactions with various medicines.

b8- Assess basic medical and pharmaceutical information to be applied in different situations related to pharmacy practice.

b9- Employ international guidelines of GMP in pharmaceutical manufacturing, drug distribution and storage.

b10- Select appropriate analytical methods required to confirm specifications of raw material (synthetic or natural) as well as pharmaceutical preparations.

b11- Apply the knowledge of organic chemistry in drug synthesis and selection of appropriate synthetic strategies.

b12- Identify and deal with different types of incompatibilities including Drug-Drug and Drug-Excipient interaction during Pre-formulation and formulation of different dosage forms as well as therapeutic incompatibilities.

b13- Utilize proper methods for isolation, purification and identification of bioactive herbal products as well as standardization of herbal preparations.

b14- Utilize the microbiological information in prevention and control of different types of infections in the community.

b15- Interpret the relation between physico-chemical properties, biological activity and other biological relationships with body receptors to develop pharmacologically active compounds using computer aided tools in drug design.

b16- Interpret experimental results obtained from qualitative and quantitative analysis of different pharmaceutical and biological samples with subsequent assessment.

b17- Utilize the knowledge of different immune responses to xenobiotics in vaccine production.

b18- Utilize physical pharmacy principles in pre-formulation and pharmaceutical analysis.

c) Professional and Practical Skills:

By the end of this program the student will be able to:

c1- Use the proper pharmaceutical medical terms, abbreviations and symbols efficiently and effectively with patient and other health care professionals.

c2- Handle chemicals, biological products, experimental animals and specimens safely and effectively.

c3- Dispose chemicals, biological, microbiological and pharmaceutical waste safely and enforce environmental protection.

c4- Correct use of pharmaceutical material in dosage form preparation and their labeling, packaging, storing, and distribution.

c5- Extract, isolate, purify and standardize herbal preparations.

c6- Synthesize, identify, quantify and purify pharmaceutical compounds including pre-requisite physical, analytical and organic chemistry technical skills.

c7- Interpret patient demographic data in order to select and provide optimal drug therapy.

c8- Recognize etiology and pathophysiology of infectious diseases and non-infectious diseases.

c9- Perform laboratory tests of infectious diseases and how to prevent and control microbial infection.

c10- Conduct laboratory investigations for diagnosis and monitoring of non-infectious diseases.

c11- Examine toxicity profiles of different xenobiotics and test poisons in biological specimens.

c12- Distinguish different types of microorganisms and demonstrate the microbial growth.

c13- Apply and implement techniques used in operating pharmaceutical equipment and instruments.

c14- Solve cases related to community pharmacy and public awareness on professional use of drugs, drug abuse and misuse.

c15- Apply therapeutic intervention in co-ordination with health care teams and pharmaceutical care.

c16- Conduct and perform pharmaceutical research, analyze data and utilize results.

c17- Employ proper documentation and drug filing systems.

c18- Carryout QC & QA for different pharmaceutical compounds and dosage forms.

d) General and Transferable Skills:

The student should be able to:

d1- Interact and communicate by verbal and written means with other health care professionals.

d2- Appraise interpretation, documentation and presentation of pharmaceutical information in different pharmacy practice settings efficiently and effectively.

d3- Demonstrate the ability to work effectively as a part of a team in diverse pharmaceutical and social settings.

d4- Apply various biological statistics in different fields of pharmacy.

d5- Implement mathematical calculations and statistical analysis in different pharmaceutical fields.

d6- Keep up with recent updates in pharmacy profession and pharmaceutical industry as a life - long independent continuing education post-graduation.

d7- Acquire ethical manners, pharmacy legalization and follow general safety guidelines in pharmacy profession affairs.

d8- Acquire skills for creativity, critical thinking, problem solving and decision making.

d9- Perform internet and digital searches to develop information technology skills and know how to retrieve information from a variety of sources.

d10- Acquire basic skills for pharmaceutical institutions including promotion, sales and marketing as well as financial management.

3- National Academic Reference Standard (NARS version 20009)

1. Attributes of the Graduates

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

1.1. Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations.

1.2. Capable of formulating, preparing pharmaceutical products from different sources and participating in systems for dispensing storage and distribution of medications.

1.3. Perform various qualitative and quantitative analytical techniques and fulfill criteria of GLP and GPMP to assure the quality of raw materials, procedures and pharmaceutical products.

1.4. Provide information and education services to community and patients about rational use of medications and medical devices.

1.5. Comprehend principles of pathophysiology of diseases and participate with other health care professionals in improving health care services using evidence-based data.

1.6. Plan, design and conduct research using appropriate methodologies.

1.7. Develop presentation, promotion, marketing, business administration, numeric and computation skills.

1.8. Demonstrate capability of communication skills, time management, critical thinking, problem solving, decision-making and team working.

1.9. Perform responsibilities in compliance with legal, ethical and professional rules.

1.10. Able to be a life-long learner for continuous improvement of professional knowledge and skills.

2- Knowledge and Understanding:

2.1. Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences 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 radio-labeled products.

2.3. Principles of different analytical techniques using GLP guidelines and validation procedures.

2.4. Principles of isolation, synthesis, purification, identification and standardization methods of pharmaceutical compounds.

2.5. Principles of drug design, development and synthesis.

2.6. Properties of different pharmaceutical dosage forms 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 studies.

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 correlation with different diseases.

2.12. Etiology, epidemiology and laboratory diagnosis and clinical features of different disease and their pharmacotherapeutic approaches.

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 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 origins.

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

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 specimens.

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 professionals 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, GPMP, 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 methods of isolation, synthesis, purification, identification and standardization of active substances from different origins.

4.6. Apply the principles of bio-informatics and computer-aided tools in drug design.

4.7. Apply various principles to determine the 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.

Coverage of National Academic Reference Standards by the Faculty of Pharmacy- program ILOs

a) Knowledge and Understanding

2	NARS	Program ILOs
2.1.	Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice.	a1
2.2.	Physicochemical properties of various substances used in preparation of medicines including inactive and active ingredient as well as biotechnology and radio-labeled products.	a2
2.3.	Principles of different analytical techniques using GLP guidelines and validation procedures.	a3
2.4.	Principles of isolation, synthesis, purification, identification and standardization methods of pharmaceutical compounds.	a4
2.5.	Principles of drug design, development and synthesis.	a5, a6
2.6.	Properties of different pharmaceutical dosage forms including novel drug delivery systems.	a7, a9
2.7.	Principles of various instruments and techniques including sampling, manufacturing, packaging, labeling, storing and distribution processes in pharmaceutical industry.	a8
2.8.	Principles of pharmacokinetics and biopharmaceutics with applications in therapeutic drug monitoring, dose modification and bioequivalence studies.	a10
2.9.	Principles of hospital pharmacy including I.V. admixture, TPN and drug distribution system.	a11, a12
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.	a13, a16
2.11.	Principles of body functions in health and disease states as well as basis of genomic and different biochemical pathways regarding their correlation with different diseases.	a15, a17
2.12.	Etiology, epidemiology and laboratory diagnosis and clinical features of different disease and their pharmacotherapeutic approaches.	a14

2.13.	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contraindications, ADRs, and drug interactions.	a18
2.14.	Principles of clinical pharmacology, pharmacovigilance and rational use of drugs.	a18, a26
2.15.	Basis of complementary and alternative medicine.	a20
2.16.	Toxic profile of drugs and other xenobiotics including sources, identification, symptoms, management control and first aid measures.	a21
2.17.	Methods of biostatistical analysis and pharmaceutical calculations.	a22
2.18.	Principles of management including financial and human resources.	a23
2.19.	Principles of drug promotion, sales and marketing, business administration, accounting and pharmacoeconomics.	a23
2.20.	Principles of proper documentation and drug filling systems.	a19
2.21.	Regulatory affairs, pharmacy laws and ethics of health care and pharmacy profession.	a24

b) Intellectual Skills

4	NARS	Program ILOs
4.1.	Apply pharmaceutical knowledge in the formulation of safe and effective medicines as well as in dealing with new drug delivery systems.	b1
4.2.	Comprehend and apply GLP, GPMP, GSP and GCP guidelines in pharmacy practice.	b9
4.3.	Apply quantitative and qualitative analytical and biological methods for QC and assay of raw materials as well as pharmaceutical preparations.	b4
4.4.	Recognize and control possible physical and / or chemical incompatibilities that may occur during drug dispensing.	b3, b12
4.5.	Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	b11, b13
4.6.	Apply the principles of bio-informatics and computer-aided tools in drug design.	b15
4.7.	Apply various principles to determine the characteristics of biopharmaceutical products.	b4
4.8.	Select and assess appropriate methods of infection control to prevent infections and promote public health.	b14

4.9.	Utilize the pharmacological basis of therapeutics in the proper selection and use of drugs in various disease conditions.	b5
4.10.	Calculate and adjust dosage and dose regimen of medications.	b6
4.11.	Assess drug interactions, ADRs and pharmacovigilance.	b7
4.12.	Apply the principles of pharmacoeconomics in promoting cost / effective pharmacotherapy.	b5
4.13.	Analyze and interpret experimental results as well as published literature.	b10, b16
4.14.	Analyze and evaluate evidence-based information needed in pharmacy practice.	b8

c) Professional and Practical Skills

3	NARS	Program ILOs
3.1.	Use the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	c1
3.2.	Handle and dispose chemicals and pharmaceutical preparation safely.	c2, c3
3.3.	Compound, dispense, label, store and distribute medicines effectively and safely.	c4
3.4.	Extract, isolate, synthesize, purify, identify, and / or standardize active substances from different origins.	c5, c6
3.5.	Select medicines based on understanding of etiology and pathophysiology of diseases.	c8
3.6.	Monitor and control microbial growth and carry out laboratory tests for identification of infectious and noninfectious diseases.	c9, c10, c12
3.7.	Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens.	c11
3.8.	Apply techniques used in operating pharmaceutical equipment and instruments.	c13
3.9.	Maintain public awareness on rational use of drugs and social health hazards of drug abuse and misuse.	c14
3.10.	Advise patients and other healthcare professionals about safe and proper use of medicines.	c7, c15
3.11.	Conduct research studies and analyze the results.	c16
3.12.	Employ proper documentation and drug filing systems.	c17

d) General and Transferable Skills

5	NARS	Program ILOs
5.1.	Communicate clearly by verbal and written means.	d1
5.2.	Retrieve and evaluate information from different sources to improve professional competencies.	d2, d9
5.3.	Work effectively in a team.	d3
5.4	Use numeracy calculation and statistical methods as well as information technology tools.	d4, d5
5.5	Practice independent learning needed for continuous professional development.	d6
5.6.	Adopt ethical, legal and safety guidelines.	d7
5.7.	Develop financial, sales and market management skills.	d10
5.8.	Demonstrate creativity and time management abilities.	d8
5.9.	Implement writing and presentation skills.	d2
5.10.	Demonstrate critical thinking, problem-solving and decision-making abilities.	d8

Teaching and learning:

The degree course features a variety of teaching approaches chosen to meet stated learning objectives including:

Lectures, practical sessions, tutorials, field visits and summer training.

Assessment:

Written examinations, practical assessments and oral presentation. Evaluation of students will be according to the following standards:

Excellent: from 85% to over from total marks.

Very good: from 75% to less than 85% from total marks.

Good: from 65% to less than 75% from total marks.

Pass: from 60% to less than 65% from total marks.

In case of failure, the evaluation is as follows:

Weak: from 30% to less than 60% from total marks.

Very weak: less than 30% from total marks.

4- Curriculum structure and contents:

a- Program duration: 5 years.

b- Program structure:

b. i- No. of credit hours per 5 years: 192 hours.

b. ii- Practical field training: 400 hours summer training.

b. iii- Program levels: Typical credit hour system is not applied.

Comparison between NARS Curriculum Structure and Faculty of Pharmacy, Kafrelsheikh University Curriculum Structure

NARS		Faculty of Pharmacy	
Sciences	**Subjects**	**Sciences**	**Subjects**
Basic **10-15%**	Physical, organic and analytical chemistry, biology, biophysics, computer science, mathematics.	**Basic** **15.6%** **(30hr/192hr)**	Organic and analytical chemistry, biology, mathematics, Medicinal Plants 1.
Pharmaceutical **35-40%**	Pharmacy Orientation, Medical & Pharmaceutical Terminology, Pharmaceutics, Physical Pharmacy, Industrial Pharmacy, Pharmaceutical Technology, Biopharmaceutics, Pharmacokinetics, Pharmaceutical Chemistry, Pharmacognosy, Pharmaceutical Microbiology, Molecular biology, Pharmaceutical Biotechnology, Quality Assurance and Quality Control, Instrumental Analysis, Biological Drug Assay.	**Pharmaceutical** **42.18 %** **(81hr/192hr)**	Pharmacy Orientation, Medical & Pharmaceutical Terminology, Pharmaceutical Formulation, Pharmaceutics, Physical Pharmacy, Industrial Pharmacy, GMP, Biopharmaceutics, Pharmacokinetics, Pharmaceutical Chemistry, applied Pharmacognosy, Pharmacognosy Pharmaceutical Microbiology, Quality Control, Instrumental Analysis, Biological Assay, Phytochemistry, Drug Design, Medicinal Plant 2.

NARS		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 23.5% (45hr/192hr)**	Anatomy, Histology, Physiology, Pathology, Biochemistry, Clinical Biochemistry, Parasitology, Pharmacology, Therapeutics, Medical Microbiology, two elective courses
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 11% (21hr/192)**	Clinical Pharmacy, Professional Pharmacy & Drug Interactions, Health Care, Applied Pharmacology, Drug Information, Pharmacy Laws and regulations.
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 5.21% (10hr/192hr)**	Public Health, Biostatistics, Toxicology, Forensic Chemistry.

NARS		Faculty of Pharmacy	
Sciences	**Subjects**	**Sciences**	**Subjects**
Behavioral and Social 2-4%	Psychology, Communications, Social and administrative pharmacy, Pharmacy Ethics.	**Behavioral and Social 2.1% (4hr/192hr)**	Psychology, Sociology.
Pharmacy Management 2-4%	Sales, Marketing and Drug Promotion, Pharmaceutical Business Administration, Pharmacoeconomics.	**Pharmacy management 3.13% (6hr/192hr)**	Marketing and Promotion.
Discretionary Up to 8%	Professional and Non-Professional Sciences	**Discretionary 2.08% (4hr/192hr)**	English
Pharmacy Training	Not less than 300hr in a pharmaceutical location.	**Pharmacy Training**	400hr in a pharmaceutical location.

Program courses

Pre-pharmacy

First semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Pharmaceutical Analytical Chemistry	1012	2	2	3
Pharmaceutical Organic Chemistry	1021	2	2	3
Medicinal Plants	1035	2	2	3
Biology	1247	2	2	3
English language	1255	2	--	2
Biostatistics	1067	2	1	2
Pharmacy Orientation	1078	1	--	1
Total				**17**

Second semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Analytical chemistry	1112	2	2	3
Organic Chemistry	1121	4	2	5
Medicinal Plants	1135	2	2	3
Mathematics	1341	2	1	2
English language	1355	2	--	2
Anatomy	1367	2	2	3
Total				**18**

First year

First semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Organic Chemistry	2011	4	2	5
Pharmaceutics	2024	2	2	3
Physiology	2237	3	2	4
Histology	2247	2	2	3
Sociology	2258	2	--	2
Pharmacognosy	2065	2	2	3
Total				**20**

Second semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Analytical Chemistry	2112	2	2	3
Physical Pharmacy	2124	2	2	3
Pharmacognosy	2135	2	2	3
Physiology	2347	3	2	4
Pharmaceutical Microbiology	2156	2	2	3
Medical & Pharmaceutical Terminology	2168	1	--	1
Psychology	2378	2	--	2
Total				**19**

Second year

First semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Instrumental Analysis	3012	2	2	3
Pharmaceutical Microbiology	3026	2	2	3
Pharmaceutical Formulations	3034	2	2	3
Biochemistry	3043	2	2	3
Chemistry of Crude drugs	3055	3	4	5
Parasitology	3066	2	2	3
Total				**20**

Second semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Pharmaceutical Formulations	3114	2	2	3
Microbiology of diseases	3126	2	2	3
Biochemistry	3133	2	2	3
Chemistry of Crude drugs	3145	3	4	5
Biopharmaceutics	3154	2	2	3
Pharmacokinetics	3168	2	2	3
Total				**20**

Third year

First semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit hrs
Pharmaceutical Formulation	4014	2	2	3
Pharmacology	4027	3	2	4
Pathology of diseases	4236	2	2	3
Hygiene	4046	3	-	3
Industrial Pharmacy	4054	2	2	3
Pharmaceutical Chemistry	4061	2	2	3
Total				**19**

Second semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Pharmaceutical Chemistry	4111	2	2	3
Pharmacognosy	4125	2	2	3
Pharmacology	4137	3	2	4
Clinical Biochemistry	4143	2	2	3
Toxicology	4157	2	2	3
Clinical Pharmacy	4168	2	2	3
History of Pharmacy & Pharmacy Laws.	4174	1	-	1
Total				**20**

Fourth year

First semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Clinical Pharmacy	5018	2	2	3
Professional Pharmacy & Drug Interactions	5028	1	2	2
Bioassays	5037	2	2	3
Therapeutics	5048	3	-	3
Industrial Pharmacy	5054	2	2	3
Forensic Chemistry	5061	1	2	2
Elective Course	(5401-5444)	2	2	3
Total				**19**

Second semester:

Course Title	Course code	No. of hr./week		
		Lecture	Lab.	Credit Hrs
Clinical Pharmacy	5118	2	2	3
Professional Pharmacy & Drug interactions	5128	1	2	2
Drug Design	5131	2	2	3
Industrial Pharmacy (GMP)	5144	1	2	2
Drug Control	5152	2	2	3
Health Care administration	5168	2	-	2
Drug Information	5178	2	-	2
Elective Courses	(5401-5444)	2	2	3
Total			Lab.	20

5. Program admission requirements:

General high school certificate with major in biology and chemistry, or an equivalent certificate from a foreign institute recognized by the Supreme Council of Universities.

6. Regulation for Progression and program completion:

"For the students to be transferred from one academic year to the next, he/she is required to have successfully passed in all subjects. However, the student may still be transferred if he/she has failed in not more than two basic subjects and two complementary ones from the same academic year or from previous years of study. In such cases, students "carrying" subjects from one year to the next, should re-sit for their "failed" subjects in their proper respective semesters. Final year students who have failed in a maximum of two basic subjects and two complementary ones in that year or from previous years can re-sit for their exams in those subjects in November of the same year. Should the student fail again, he/she has to re-sit for his/her exams in those subjects in their proper

respective semesters thereafter as many times as necessary until he/she succeeds." Bylaws and Regulations for Undergraduate Students, Faculty of Pharmacy, Kafrelsheikh University.

Enrollment opportunities for "regular" and "external" students:

Educational Year	Enrollment opportunities	
	Regular student	External students
Pre-pharmacy	Two opportunities	None
First	Two opportunities	One opportunity
Second	Two opportunities	Three opportunities
Third	Two opportunities	Three opportunities
Fourth	Two opportunities	Two opportunities, but if the student succeeds in half the number of subjects, he/she would be allowed to re-sit for the exam in the subjects he/he has failed in indefinitely until he/she is graduated.

"Once a student exhausts the number of opportunities of being a "regular" student, he becomes an "external" student for a certain number of times according to the above table. Once an "external" student in a certain year succeeds in his/her exams for that year to allow him/her to be transferred to the following year, he/she automatically becomes registered as a "regular" student again". Bylaws and Regulations for Undergraduate Students, Faculty of Pharmacy, Kafrelsheikh University.

7. Evaluation of program intended learning outcomes:

Evaluator	Tool	Sample
Senior students	Questionnaire	100
Alumni	Questionnaire	20
Stakeholders	Questionnaire	10
External evaluator		
Others	None	None

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