



## Faculty of Pharmacy and Drug Technology

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### Program Specification

2018-2019

PRGRAM COORDINATOR: PROF. DR. GOUDA HELAL



Faculty of Pharmacy and Drug Technology

## Program Specification

### A- Basic Information:

- 1- **Program Title:** Bachelor of Pharmaceutical Sciences and Drug Technology
- 2- **Program type:** Single
- 3- **Departments responsible of the program:**
  - a. Department of Pharmaceutical Chemistry
  - b. Department of Pharmacogonsy and Medicinal Plants
  - c. Department of Pharmaceutics and pharmaceutical Technology
  - d. Department of Pharmacology and Toxicology
  - e. Department of Biochemistry and Biotechnology
  - f. Department of Microbiology and Public Health
  - g. Department of Pharmacy Practice
  - h. University Requirement Department (Core program)
- 4- **Date of approval of Program specification by the Faculty Council:**  
Approved on 22/10/2012, latest reapproval 5/9/2018.
- 5- **Coordinator:** Prof. Dr. Gouda Helal, Dean of Faculty of Pharmacy and Drug Technology.
- 6- **External evaluation:** Prof. Dr. Aliaa Kamal, Professor of Organic Chemistry, Faculty of Pharmacy, Cairo University, Head of Organic Chemistry Dept., Faculty of Pharmacy, MSA University.

## **B- Professional Information:**

### **1- Program aims:**

The program of Pharmaceutical Sciences and Drug Technology aims to give students the basic knowledge, skills, attitudes and values to practice pharmacy independently at the time of graduation and encourage continuous self-learning hereafter in order to enrich the Egyptian pharmaceutical sector and society with capable and skilled pharmacists. The program ensures that graduates are proficient in:

- I. The proper handling of chemicals, narcotics and pharmaceutical products in accordance with legal, ethical and professional guidelines.
- II. The different methods of preparing and formulating pharmaceutical products from different sources (natural/synthetic) and to choose the appropriate dispensing, storage and distribution methods of medications.
- III. The capability of communication, time management, critical thinking, problem solving, decision-making, team-working, marketing, promotion, business and computation and numeric skills.
- IV. The inclusive illustration to 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.
- V. Providing patient-centered care through the ability to design, implement, monitor and adjust pharmacy care plans that are patient-specific and evidence based
- VI. Promoting the availability of safe and effective therapeutic agents through the ability to apply qualitative and quantitative techniques in quality control and fulfill criteria for both GLP and GMP to assure the quality of raw materials, procedures and pharmaceutical products.
- VII. Communicating and collaborating with patients, care givers and other members of the community to provide information on the rational use of medications and the progress of therapy programs.
- VIII. Providing information and education services to community and patients about rational use of medications and medical devices.
- IX. Carrying out duties in accordance with legal, ethical and social guidelines.
- X. Working in hospitals, cancer units, pharmacy, forensic medicine field, industrial, research institutes and biochemical laboratories and applying the concepts of clinical pharmacy.
- XI. Appropriate methodologies selection to design and conduct researches.
- XII. Self-profession improvement by continuous and lifelong learning in fields of languages, communication, enterprise, arts, culture, social sciences, nature, community and sustainable development.

## **2- Intended Learning outcomes (ILO's) for program**

### **A. knowledge and Understanding:**

By the end of the program, the graduates should be able to:

A.1 Describe main principles in basic, pharmaceutical, medicinal, therapeutic, research concepts, health and environmental sciences.

A.2 Outline fundamental concepts of pharmacy practice, behavioral, social and pharmacy management as well as non-professional sciences.

A.3 Memorize physicochemical characters of drugs and their relationship to biological distribution as well as different applications of radiopharmaceuticals.

A.4 Identify biotechnology products, technologies of genomics and gene therapy and their applications in pharmaceutical drug delivery system.

A.5 Identify the principles and applications of analytical and synthetic techniques in Pharmacy besides principles of detection and limit test analysis of active ingredients (natural and synthetic) and impurities in pharmaceutical products.

A.6 List different methods of instrumental analysis, fundamental basis of different spectroscopic techniques and correlation of spectral data and chemical structures.

A.7 Identify sources, isolation, purification, characterization, standardization methods, clinical testing and distribution of (natural & synthetic) substances in medicines.

A.8 Describe principles, development and application of quality assurance process for natural and synthetic compounds.

A.9 Identify the principles of drug design, development and computer –aided techniques in designing and formulation of pharmaceutical products.

A.10 Describe the different dosage forms (systemic, topical or novel drug delivery systems) concerning preparation, problems of manufacture and pharmaceutical application.

A.11 Describe the nomenclature rules, synthesis, development, formulation, testing and quality control of medicines of natural & synthetic sources.

A.12 Identify equipment used in pharmaceutical processes, how to control the processing parameters in order to obtain a desired product and how they are brought to market place.

A.13 Outline basics of sampling, manufacturing, packaging, labeling, storing and distribution process in pharmaceutical industries following Good Pharmaceutical Manufacturing Practice (GPMP).

A.14 Identify principles that affect drug release from dosage forms, drug absorption, distribution, metabolism, excretion, impact of those properties on clinical pharmacokinetics and pharmacodynamics.

- A.15 List the pharmacotherapeutic properties of different classes of drugs affecting body systems and the effect of the body on drugs.
- A.16 Describe the pathway of medications in the body, timing of blood sampling and therapeutic drug monitoring (TDM).
- A.17 Memorize the roles of the professional pharmacist, in community pharmacies, hospitals and pharmaceutical industry to formulate, dispense and manufacture safe and effective drugs.
- A.18. Outline the theoretical and social basis of individual and public health and health care systems to improve the contribution of pharmacist in health care.
- A.19 Outline the association between risk factors and disease; major epidemiological study designs, and the ministry of health (MOH) programs for the prevention and control of the acquired diseases in hospital and community.
- A.20 Identify infectious agents and parasites of medical importance and their clinical signs, symptoms, and complications.
- A.21 List microbial contaminations and its control, sterilization processes and aseptic procedures, for preparation of sterile dosage forms and factors affecting their absorption.
- A.22 Recognize the biochemical functions of the different organs of human body in health and disease states as well as the role of enzymes in regulation of metabolic pathways and drug metabolism.
- A.23 State physiological, pathological and chemical pathways of normal and abnormal functions of human body systems.
- A.24 Explain the application of molecular biology, biotechnology, immunology in genomics and biochemical processes to supply proper medicines.
- A.25 Recognize concepts of analysis of different biological and non-biological samples by qualitative and quantitative methods.
- A.26 Describe the basic principles of drug pharmacological actions and their therapeutic uses, adverse effects and principles of dosing for different drugs and clinical manifestations of different diseases.
- A.27 Recognize drug-receptor interactions, drug-drug interactions and structure activity relationship.
- A.28 List the indications, dose, mechanism of action, relative advantages and disadvantages of various therapeutic classes and stem cell therapy for common and life threatening illness according to the good laboratory practice (GLP) guidelines and clinical pharmacology principles and good clinical practice (GCP).
- A.29 Describe the major groups of drugs of addiction/abuse, their effect on the body and how to manage them.

- A.30 Collect the adverse drug reaction (ADRs) reports according to recent guidelines for rationale use of drugs and improvement of health care services.
- A.31 Describe the basic principles of plant morphology, tissue culture, chromatography, complementary and alternative medicine.
- A.32. Outline the concepts, development and application of cosmetic products, dressings, diagnostics, appliances and complementary therapies.
- A.33 Identify xenobiotic intoxication, sources, symptoms, management and antidotes.
- A.34 Outline first-aid measures for many different conditions and intoxications, demonstrating the importance of medical and allied managements for life saving procedures.
- A.35 Recognize basics of prescription, compounding and pharmaceutical calculations as well as statistical techniques in pharmacy practice.
- A.36 Identify basics of pharmaceutical management including financial aspects, human resources, social and psychological issues.
- A.37 Recognize principles of drug promotion, sales, marketing and pharmaco-economics.
- A.38 Discuss business administration, marketing and related sciences.
- A.39 Memorize the roles of proper documentation of patient history and drug filing and validation systems
- A.40 Identify Law; legal and ethical system and codes pertaining to Pharmacy.
- A.41 Recognize pharmacopoeial and regulatory requirements and their importance in pharmaceutical sciences.
- A.42 Identify the information related to Egyptian civilization and history.
- A.43 Identify the scientific research ethics and their field career practice.
- A.44 Recognise human, social, or natural phenomena and the science related to their field.
- A.45 Describe different aspects of life.
- A.46 Identify natural and induced environmental changes.
- A.47 Recognize the role of sustainability in developing of countries.
- A.48 Identify the concept of evolution and its importance.
- A.49 Identify different psychological issues.
- A.50 Identify the importance of law.
- A.51 Define the importance and meaning of arts for developing their personal and social skills and competencies.
- A.52 Identify different parts of the human body and its movements.
- A.53 Determine the importance of breathing movement and health.

A.54 Recognize basic vocabulary range of isolated words and phrases related to particular situations.

## **B. Professional and Practical Skills**

B.1 Use professional medical and pharmaceutical terms.

B.2 Utilize pharmaceutical symbols and abbreviations in pharmaceutical sciences.

B.3 Handle safely chemical, pharmaceutical materials and laboratory animals following standard pharmaceutical laboratory procedures.

B.4 Formulate, compound, dispense, supply and distribute medicines according to professional standards, legislation, professional ethics and marketing principles.

B.5 Determine the physicochemical properties of different materials used in pharmaceutical preparations to assure optimum packaging, storing, quality and safety of drugs.

B.6 Carry out different calculations for formulation, compounding of dosage forms and design dosage regimens for patients.

B.7 Apply the practical methods required for identification of the primary & secondary metabolites in both animal and plant cells.

B.8 Apply different techniques in extractions, isolation, synthesis, purification, and determination and/ or standardization of natural and synthetic materials.

B.9 Design and perform experiments for detection of adulteration and use the methods for screening, extraction and isolation of both natural and synthetic products.

B.10 Design rational therapeutic strategies for both acute and chronic conditions considering economic issues and patients' variables that influence these strategies.

B.11 Analyze the drug release, absorption, distribution and elimination after different routes of administration and the factors affecting them.

B.12 Carry out the laboratory techniques and procedures for analysis of different biological and non-biological specimens.

B.13 Discuss the genetic causes, macroscopic and microscopic criteria of the altered structures and functions of the body organs in different diseases and medical conditions.

B.14 Estimate problems of manufacture of sterile and non-sterile dosage forms providing appropriate solutions and methods for microbiological testing and analysis.

B.15 Examine microbial infections in order to differentiate and classify those applying methods of infection control and immunization.

B.16 Assess the effects of xenobiotic on the human health to select the proper antidote to manage specific toxicities.

B.17 Analyze toxicants from different sources for better clinical management.



- B.18 Apply techniques and use laboratory equipment included in pharmaceutical industry to compound different dosage forms and biotechnological products.
- B.19 Apply chromatographic, spectroscopic, molecular, and tissue culture techniques for identification and assessment of natural and synthetic materials.
- B.20 Use microscopic examination for identification of herbal drugs, different types of microorganisms and parasites as well as determination of particle size.
- B.21 Utilize a multidisciplinary approach for disease prevention and national health care programs to address specific public health awareness
- B.22 Develop skills for dealing with diverse human personalities, counseling patients about proper and safe use of medication.
- B.23 Provide updated information to patients and healthcare professionals about the proper use of medicine and its probable adverse effects.
- B.24 Apply the principles of diagnosis, medical care and risk management to interact correctly, professionally and ethically with patients and other health care providers.
- B.25 Advise patients and health care team members about the proper, economic, safe drug use.
- B.26 Analyze patient-based information to resolve drug related problems and incompatibilities encountered in drug prescriptions.
- B.27 Analyze data obtained from researches and assignments and clinical trails
- B.28 Apply proper documentation of patient profiles, filling of herbal & synthetic drugs and quality assurance charts.
- B.29 Draw different biographs and biological analysis of isolated organs, experiments and filing out relevant laboratory worksheets.
- B.30 Write varied paragraph.
- B.31 Employ learned information and terms in their work.
- B.32 Use correct grammar in writing a certain topic or report.
- B.33 Apply philosophical approaches in developing their work.
- B.34 Write scientific reports and feasibility studies.
- B.35 Design research projects.
- B.36 Design work environment, which achieve environmental safety and security.
- B.37 Collect realistic and historical datum about different humanity sides.
- B.38 Apply quantitative and qualitative analysis of given data.
- B.39 Apply effectively artistic process.
- B.40 Create successful performance sequences.
- B.41 Collaborate in artistic process.



## C. Intellectual Skills

- C.1 Predict the proper method and equipment for preparation of different dosage forms and management of the expected problems during large-scale manufacture.
- C.2 Integrate different types of prescriptions safely as parenteral administrations, narcotics, sterile and non-sterile preparations and new drug delivery systems.
- C.3 Apply the fundamental concepts and practical considerations necessary to assure the quality, effectiveness and proper cost of pharmaceutical products and scientific research.
- C.4 Select techniques necessary to maintain the microbiological purity of sterile products.
- C.5 Apply cGMP guidelines in preparation, identification, standardization and quality control of herbal and non-herbal drugs and their use as alternative medicine.
- C.6 Apply the most suitable biological and instrumental techniques for the qualitative and quantitative analysis of natural and synthetic pharmaceutical products and GCP ethical guidelines in the pharmacy practice.
- C.7 Follow schemes to analyze different biological and synthetic pharmaceutical materials.
- C.8 Select the appropriate methods of identification, screening and standardization of active substances of natural and synthetic different origins.
- C.9 Design strategies to avoid or manage drug interactions and possible physical or chemical incompatibilities during prescribing, dispensing and administration of drug.
- C.10 Apply information regarding physico-chemical principle related to states of matter, in designing and dispensing dosage forms.
- C.11 Apply nomenclature rules for naming of organic pharmaceutical compounds and recognize their chemical properties, synthesis, separation and purification methods.
- C.12 Select the appropriate methods to identify and elucidate the structure of pharmaceutical compounds by different techniques.
- C.13 Differentiate between types of plant cells belonging to different plant organs using their morphological and anatomical character for differentiation between official and non-official plants and for standardization of active constituents.
- C.14 Apply computer aided tools in drug design, analysis, formulation and calculation of pharmacokinetic parameters.
- C.15 Predict and apply drug design, therapeutic protocols and/ or life saving measures for management of common diseases and emergency conditions.
- C.16 Apply structure activity relationship and pharmacodynamics concepts in determination of characters of biopharmaceutical products.

C.17 Illustrate different applications of tissue culture in the pharmaceutical fields as research and bio-pharmaceutical products.

C.18 Point out different techniques of gene therapy and their biotechnological products and applications.

C. 19 Discuss different approaches including microbial and biological processes for evaluation of patients' symptoms leading to recognition of common disease states moreover making appropriate recommendations to optimize patient care within professional ethics.

C.20 Describe the different groups of antimicrobial agents, promoting their use in infection control and public health concepts.

C.21 Interpret specific symptoms and signs caused by certain infectious agents, certain parasite and interpret the clinical and laboratory findings for control or prevention of infection.

C.22 Select and suggest natural and/ or synthetic drugs in treatment of different diseases according to pharmacological action.

C.23 Integrate the knowledge obtained from metabolic pathways in the different physiological and pathological conditions in proper selection of drugs for treatment of different conditions.

C.24 Integrate the basic concepts of biochemistry, histology and anatomy in laboratory diagnosis of disease states.

C.25 Calculate accurately drug's dosage, bioavailability, plasma half-life and volume of distribution in different patient.

C.26 Point out poisons and drugs in biological specimens, recognizing toxicity signs and correlating it with the causative infectious and noninfectious agents.

C.27 Design, implement, and evaluate patient specific pharmacotherapeutic regimens considering adverse drug events.

C.28 Sketch plans for patients and other health care professionals conduction for safe and effective use of medicine based on pharmacovigilance studies.

C.29 Design therapeutic protocols considering any legal restrictions, cost effectiveness and marketing issues.

C.30 Apply basics of profession relationship as well as behavioral and communication skills in pharmaceutical management.

C.31 Select medical terms correctly and in creative writing and interpreting published data.

C.32 Interpret the data obtained from experimental work and correlating them with published data for best approach evaluation.

C.33 Apply evidence based practice in the development of a rational choice of patient therapy taking into account, possible drug interactions

- C.34 Follow the scientific approach in thinking and deduction methods.
- C.35 Apply critical thinking in dealing with research questions.
- C.36 Diagnose problems in order to feasible solutions suggestion for them.
- C.37 Distinguish between the alternatives for reaching best solutions.
- C.38 Suggest creative ideas and visions in their field of specialization.
- C.39 Differentiate between shapes in nature.
- C.40 Illustrate the assessment process of body movement sequences.
- C.41 Integrate their own artworks with others.
- C.42 Compile the process of art transformation.
- C.43 Prioritize the awareness of students sensations, perception of surrounding and deeper understanding of being a part of it.

#### **D. General and Transferable Skills**

- D.1 Augment communication, negotiation and professional customer skills.
- D.2 Adopt proper spoken and written language.
- D.3 Evaluate information to solve problems.
- D.4 Summarize key points taken from variety of standard sources.
- D.5 Interact efficiently in teamwork & group discussion
- D.6 Work efficiently in laboratory and manufacturing environment.
- D.7 Acquire computer skills and design novel solutions.
- D.8 Adopt usage of statistical qualitative and quantitative data as well as other information technology tools.
- D.9 Improve self-learning skills depending on updated researches.
- D.10 Appraise research or surveys using minimal guidance of available data.
- D.11 Attain an ethical, legal attitude and approach.
- D.12 Value proper safety measures according to standard guidelines.
- D.13 Expand sale skills to improve market surveys.
- D.14 Create new research ideas.
- D.15 Acquire effective time management skills.
- D.16 Improve scientific writing and presentation skills.
- D.17 Improve critical thinking regarding problems and situations where descisions should be made on bases of limited information.
- D.18 Appraise feedback to improve performance

### 3- Academic Standards :

National academic references standards pharmacy (**NARS January 2009**) set by the National Authority for Quality Assurance and Accreditation of Education in Egypt (<http://naqaae.eg/wp-content/uploads/2014/PDF/2.pdf>) were adopted as academic standards for the program (Faculty council No. 1) and readopted by Faculty's Council No.(11) on 8<sup>th</sup> of June 2014 furthermore, Program ILOs vs. NARS, Program ILOs vs. Program aims and Program ILOs vs. Program courses association matrices were constructed (Appendices 1.2 and 3).

### 4- External Reference Standards and bench marks :

Not present.

### 5- Program Structure and components:

a. Program duration: **Five academic years.**

b. Curriculum structure

Credit hours: 180 credit hours

- Theoretical and practical credit hours distribution

|                    |     |                  |    |       |     |
|--------------------|-----|------------------|----|-------|-----|
| Theoretical hours: | 117 | Practical hours: | 63 | Total | 180 |
|--------------------|-----|------------------|----|-------|-----|

- Mandatory and elective credit hours distribution

|                        |     |                        |    |       |     |
|------------------------|-----|------------------------|----|-------|-----|
| Mandatory hours:       | 165 | Elective hours:        | 15 | Total | 180 |
| Faculty                | 153 | Faculty                | 9  |       | 162 |
| University Requirement | 12  | University Requirement | 6  |       | 18  |

#### Program structure:

|                                   | Number of subjects | Credit hours | %    |   | NSRS % |
|-----------------------------------|--------------------|--------------|------|---|--------|
| 1 Basic Sciences                  | 9                  | 21           | 11.7 | % | 10-15  |
| 2 Pharmaceutical Sciences         | 26                 | 66           | 36.7 | % | 35-40  |
| 3 Medical Sciences                | 13                 | 39           | 21.7 | % | 20-25  |
| 4 Pharmacy Practice               | 13                 | 24           | 13.3 | % | 10-15  |
| 5 Health & environmental Sciences | 9                  | 15           | 8.3  | % | 5-10   |
| 6 Behavioral & Social Sciences    | 8                  | 8            | 4.4  | % | 2-4    |
| 7 Pharmacy Management             | 5                  | 7            | 3.9  | % | 2-4    |

## Comparison between NARS Curriculum Structure and Faculty of Pharmacy and Drug Technology, Heliopolis University Curriculum Structure:

| NARS                                       |   | Faculty of Pharmacy and Drug Technology,<br>Heliopolis University       |  |
|--|---|---|--|
| Sciences                                   | Subjects  | Sciences  | Subjects   |
| <b>Basic</b><br><br><b>10-15%</b>          | Physical, organic and analytical chemistry, biology, biophysics, computer science, mathematics.   | <b>Basic</b><br><br><b>11.7%</b><br><br><b>(21CHr/180CHr)</b>           | General and Physical Chemistry<br>Organic Chemistry 1<br>Academic English writing 1<br>Analytical Chemistry 1<br>Organic Chemistry 2<br>General biology<br>Academic English writing 2<br>Analytical chemistry 2<br>German Language 1   |
| <b>Pharmaceutical</b><br><br><b>35-40%</b> | 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. | <b>Pharmaceutical</b><br><br><b>36.7 %</b><br><br><b>(66CHr/180CHr)</b> | Pharmacy Orientation<br>Botany<br>Medical Terminology<br>Physical Pharmacy<br>Pharmacognosy 1<br>Pharmaceutics 1<br>Pharmacognosy 2<br>Pharmaceutics 2<br>Phytochemistry 1<br>Pharmaceutical Microbiology<br>Pharmaceutics 3<br>Phytochemistry 2<br>Instrumental Analysis<br>Industrial Pharmacy<br>Quality Control of herbal drugs<br>Pharmaceutical biotechnology 1<br>Medicinal Chemistry 1<br>Pharmaceutical biotechnology 2<br>Medicinal Chemistry 2<br>New Drug delivery systems<br>Drug design of natural products<br>Quality Control<br>Drug quality assurance<br>Practice in Industrial Pharmacy<br>Biopharmaceutics and Pharmacokinetics<br>Phytotherapy |

| NARS  |  | Faculty of Pharmacy and Drug Technology, Heliopolis University          |   |
|---|--|---|---|
| Sciences  | Subjects   | Sciences  | Subjects  |
| <b>Medical</b><br><b>20-25%</b>                 | Anatomy, Histology, Physiology, Pathology, Biochemistry, Parasitology, Pharmacology, Clinical Pharmacology, Therapeutics, Medical Microbiology, Immunology And Virology.                   | <b>Medical</b><br><b>21.7%</b><br><b>(39CHr/180CHr)</b>                 | Human anatomy and histology<br>Human physiology<br>Microbiology and immunology<br>Biochemistry 1<br>Pharmacology 1<br>Biochemistry 2<br>Pharmacology 2<br>Medical microbiology<br>Pharmacology 3<br>Pharmacotherapy 1<br>Clinical biochemistry<br>Pharmacotherapy 2<br>Pharmacotherapy 3  |
| <b>Pharmacy Practice</b><br><b>10-15%</b>       | Pharmaceutical Care and Professional Pharmacy, (Clinical, Hospital, Community ...etc), Complementary and alternative medicine, Drug and poison Information, Pharmacy Laws and regulations. | <b>Pharmacy Practice</b><br><b>13.3%</b><br><b>(24CHr/180CHr)</b>       | Research methodology<br>Practice in community pharmacy<br>Pharmacy practice 1<br>Pharmacy practice 2<br>Pharmacy legislation<br>Professional experience in hospital<br>Graduation project part 1<br>Clinical trials<br>Graduation Project part 2<br>Drug design and discovery<br>Pharmacy skills*<br>Complementary and alternative medicine*<br>Psychology <sup>#</sup> |
| <b>Health And Environmental</b><br><b>5-10%</b> | Public Health, Egyptian health system and its policies, Biostatistics, Healthy Life Style, Toxicology, Forensic Medicine, First Aid And Emergency Medicine                                 | <b>Health And Environmental</b><br><b>8.3%</b><br><b>(15CHr/180CHr)</b> | Pharmaceutical biostatistics<br>Health care systems<br>Toxicology and forensic medicine<br>Public health<br>Sustainable development<br>First aid<br>Ethics of biotechnology*<br>Sociology <sup>#</sup><br>Deep ecology <sup>#</sup>   |
| <b>Behavioral and Social</b><br><b>2-4%</b>     | Psychology, Communications, Social and administrative pharmacy, Pharmacy Ethics.   | <b>Behavioral and Social</b><br><b>4.4%</b><br><b>(8CHr/180CHr)</b>     | Perception actuality<br>Arabic literature<br>Philosophy<br>Art creative process<br>Human rights and politics<br>Culture and history<br>Communication through art<br>Communication skills <sup>#</sup>   |

| NARS  |   | Faculty of Pharmacy and Drug Technology,<br>Heliopolis University         |   |
|---|---|---|---|
| Sciences                                      | Subjects  | Sciences  | Subjects  |
| <b>Pharmacy management</b><br><br><b>2-4%</b> | Sales, Marketing And<br>Drug Promotion,<br>Pharmaceutical Business<br>Administration,<br>Pharmacoeconomics. | <b>Pharmacy management</b><br><br><b>3.9%</b><br><br><b>(7CHr/180CHr)</b> | Pharmacy management<br>Creativity and entrepreneurs<br>Pharmacoeconomics<br><b>Practicing individual presence<sup>#</sup></b><br><b>Diversity interaction<sup>#</sup></b> |

\* Selected course from faculty of pharmacy and drug technology elective courses considering specified category.

<sup>#</sup> Selected course from university requirement elective courses considering specified category.

### c. Program Levels:

| Study level | Student level | Percentage of the earned credit hours |
|-------------|---------------|---------------------------------------|
| 0           | Freshman      | From 0% to 20%                        |
| 1           | Sophomore     | From 20% to 40%                       |
| 2           | Junior        | From 40% to 60%                       |
| 3           | Senior 1      | From 60% to 80%                       |
| 4           | Senior 2      | From 80% to 100%                      |

### d. Program Courses:

| Serial               | Course Code | Prerequisite | Course Title                   | Credit Hours | Weekly Hours |           |          | Year / Level*  | Semester* |
|----------------------|-------------|--------------|--------------------------------|--------------|--------------|-----------|----------|----------------|-----------|
|                      |             |              |                                |              | Theoretical  | Practical | Tutorial |                |           |
| A- Mandatory Courses |             |              |                                |              |              |           |          |                |           |
| 1                    | 3100        | Registration | General and physical chemistry | 3            | 2            | 2         |          | First year / 0 | Fall      |
| 2                    | 3300        | Registration | Pharmacy orientation           | 1            | 1            | 0         |          | First year / 0 | Fall      |
| 3                    | 3200        | Registration | Botany                         | 3            | 2            | 2         |          | First year / 0 | Fall      |
| 4                    | 3101        | Registration | Organic chemistry 1            | 4            | 3            | 2         |          | First year / 0 | Fall      |
| 5                    | 3400        | Registration | Human anatomy & Histology      | 3            | 2            | 2         |          | First year / 0 | Fall      |



| Serial | Course Code | Prerequisite | Course Title                | Credit Hours | Weekly Hours |           |          | Year / Level*   | Semester* |
|--------|-------------|--------------|-----------------------------|--------------|--------------|-----------|----------|-----------------|-----------|
|        |             |              |                             |              | Theoretical  | Practical | Tutorial |                 |           |
| 6      | 3401        | Registration | Medical Terminology         | 2            | 2            |           |          | First year / 0  | Fall      |
| 7      | 3111        | 3101         | Organic chemistry 2         | 3            | 2            | 2         |          | First year / 0  | Spring    |
| 8      | 3211        | 3200         | Pharmacognosy 1             | 3            | 2            | 2         |          | First year / 0  | Spring    |
| 9      | 3311        | 3300         | Physical pharmacy           | 3            | 2            | 2         |          | First year / 0  | Spring    |
| 10     | 3112        | 3100         | Analytical chemistry 1      | 3            | 2            | 2         |          | First year / 0  | Spring    |
| 11     | 3412        | 3400         | Human physiology            | 2            | 2            |           |          | First year / 0  | Spring    |
| 12     | 3520        | Registration | General biology             | 2            | 2            |           |          | First year / 0  | Spring    |
| 13     | 3620        | 3401         | Microbiology and immunology | 4            | 3            | 2         |          | Second year / 1 | Fall      |
| 14     | 3720        | Registration | Pharmacy management         | 2            | 2            |           |          | Third year / 2  | Spring    |
| 15     | 3221        | 3211         | Pharmacognosy 2             | 3            | 2            | 2         |          | Second year / 1 | Fall      |
| 16     | 3322        | 3311         | Pharmaceutics 1             | 3            | 2            | 2         |          | Second year / 1 | Fall      |
| 17     | 3122        | 3112         | Analytical chemistry 2      | 3            | 2            | 2         |          | Second year / 1 | Fall      |
| 18     | 3630        | 3620         | Pharmaceutical microbiology | 3            | 2            | 2         |          | Second year / 1 | Spring    |
| 19     | 3531        | 3101         | Biochemistry 1              | 3            | 2            | 2         |          | Second year / 1 | Fall      |
| 20     | 3731        | Registration | Research methodology        | 1            | 1            |           |          | Second year / 1 | Spring    |
| 21     | 3332        | 3322         | Pharmaceutics 2             | 3            | 2            | 2         |          | Second year / 1 | Spring    |
| 22     | 3232        | 3221         | Phytochemisrty 1            | 3            | 2            | 2         |          | Second year / 1 | Spring    |
| 23     | 3132        | 3122         | Instrumental analysis       | 3            | 2            | 2         |          | Third year / 2  | Fall      |
| 24     | 3640        | 3630         | Medical microbiology        | 3            | 2            | 2         |          | Third year / 2  | Fall      |
| 25     | 3541        | 3531         | Biochemistry 2              | 3            | 2            | 2         |          | Second year / 1 | Spring    |
| 26     | 3242        | 3221         | Phytochemistry 2            | 3            | 2            | 2         |          | Third year / 2  | Fall      |
| 27     | 3342        | 3332         | Pharmaceutics 3             | 3            | 2            | 2         |          | Third year / 2  | Fall      |
| 28     | 3443        | 3531         | Pharmacology 1              | 3            | 2            | 2         |          | Second year / 1 | Spring    |

| Serial | Course Code | Prerequisite | Course Title                          | Credit Hours | Weekly Hours |           |          | Year / Level*   | Semester* |
|--------|-------------|--------------|---------------------------------------|--------------|--------------|-----------|----------|-----------------|-----------|
|        |             |              |                                       |              | Theoretical  | Practical | Tutorial |                 |           |
| 29     | 3551        | 3541         | Clinical biochemistry                 | 3            | 2            | 2         |          | Fourth year / 3 | Spring    |
| 30     | 3552        | 3541         | Pharmaceutical biotechnology 1        | 2            | 2            |           |          | Third year / 2  | Spring    |
| 31     | 3752        | 3720         | Pharmacy legislation                  | 1            | 1            |           |          | Fourth year / 3 | Spring    |
| 32     | 3153        | 3111         | Medicinal chemistry 1                 | 3            | 2            | 2         |          | Third year / 2  | Spring    |
| 33     | 3453        | 3443         | Pharmacology 2                        | 3            | 2            | 2         |          | Third year / 2  | Fall      |
| 34     | 3353        | 3332         | Biopharmaceutics and pharmacokinetics | 3            | 2            | 2         |          | Fourth year / 3 | Spring    |
| 35     | 3253        | 3132         | Quality control of herbal drugs       | 3            | 2            | 2         |          | Third year / 2  | Spring    |
| 36     | 3562        | 3552         | Pharmaceutical biotechnology 2        | 2            | 2            |           |          | Fourth year / 3 | Fall      |
| 37     | 3763        | 3720         | Health care systems                   | 1            | 1            |           |          | Fifth year / 4  | Fall      |
| 38     | 3463        | 3443         | Pharmacology 3                        | 3            | 2            | 2         |          | Fourth year / 3 | Fall      |
| 39     | 3163        | 3153         | Medicinal chemistry 2                 | 3            | 2            | 2         |          | Fourth year / 3 | Fall      |
| 40     | 3764        | 3453         | Pharmacy practice 1                   | 3            | 2            | 2         |          | Third year / 2  | Spring    |
| 41     | 3765        | 3453         | Pharmacotherapy 1                     | 3            | 2            | 2         |          | Fourth year / 3 | Fall      |
| 42     | 3473        | 3453         | Toxicology and forensic medicine      | 3            | 2            | 2         |          | Fifth year / 4  | Spring    |
| 43     | 3274        | 3242         | Phytotherapy                          | 2            | 1            | 2         |          | Fourth year / 3 | Spring    |
| 44     | 3774        | 3764         | Pharmacy practice 2                   | 3            | 2            | 2         |          | Fourth year / 3 | Fall      |
| 45     | 3374        | 3342         | Industrial Pharmacy                   | 3            | 2            | 2         |          | Third year / 2  | Spring    |
| 46     | 3775        | 3765         | Pharmacotherapy 2                     | 3            | 2            | 2         |          | Fourth year / 3 | Spring    |
| 47     | 3778        | 3764         | Practice in community Pharmacy        | 2            |              | 4         |          | Third year / 2  | Fall      |
| 48     | 3681        | 3640         | Public health                         | 3            | 2            | 2         |          | Fifth year / 4  | Spring    |
| 49     | 3781        | 3720         | Pharmacoeconomics                     | 2            | 2            |           |          | Fifth year / 4  | Fall      |

| Serial              | Course Code | Prerequisite | Course Title                         | Credit Hours | Weekly Hours |           |          | Year / Level*   | Semester* |
|---------------------|-------------|--------------|--------------------------------------|--------------|--------------|-----------|----------|-----------------|-----------|
|                     |             |              |                                      |              | Theoretical  | Practical | Tutorial |                 |           |
| 50                  | 3483        | 3453         | Pharmaceutical biostatistics         | 1            | 1            |           |          | Fifth year / 4  | Fall      |
| 51                  | 3385        | 3342         | New drug delivery system             | 3            | 2            | 2         |          | Fifth year / 4  | Fall      |
| 52                  | 3285        | 3253         | Drug design of natural products      | 1            | 1            |           |          | Fifth year / 4  | Fall      |
| 53                  | 3785        | 3765         | Pharmacotherapy 3                    | 3            | 2            | 2         |          | Fifth year / 4  | Fall      |
| 54                  | 3788        | 3374         | Practice in pharmaceutical industry  | 2            |              | 4         |          | Fourth year / 3 | Fall      |
| 55                  | 3789        | 3764         | Graduation project part 1            | 1            |              | 2         |          | Fifth year / 4  | Fall      |
| 56                  | 3192        | 3132         | Quality control                      | 2            | 1            | 2         |          | Fifth year / 4  | Spring    |
| 57                  | 3193        | 3153         | Drug design and discovery            | 1            | 1            |           |          | Fifth year / 4  | Spring    |
| 58                  | 3494        | 3401         | First aid                            | 1            | 1            |           |          | Fifth year / 4  | Spring    |
| 59                  | 3396        | 3385         | Drug quality assurance               | 1            | 1            |           |          | Fifth year / 4  | Spring    |
| 60                  | 3796        | 3765         | Clinical trials                      | 2            | 1            | 2         |          | Fifth year / 4  | Spring    |
| 61                  | 3798        | 3774         | Professional experience in hospitals | 2            |              | 4         |          | Fifth year / 4  | Fall      |
| 62                  | 3799        | 3789         | Graduation project (part 2)          | 1            |              | 2         |          | Fifth year / 4  | Spring    |
| B- Elective courses |             |              |                                      |              |              |           |          |                 |           |
| 1                   | 3573        | 3562         | Ethics of biotechnology              | 3            | 2            | 2         |          | Fourth year / 3 | Spring    |
| 2                   | 3776        | 3774         | Pharmacotherapy 4                    | 3            | 2            | 2         |          | Fourth year / 3 | Spring    |
| 3                   | 3276        | 3221         | Plant biotechnology                  | 3            | 2            | 2         |          | Fourth year / 3 | Spring    |
| 4                   | 3777        | 3720         | Pharmaceutical Marketing             | 3            | 2            | 2         |          | Fifth year / 4  | Fall      |
| 5                   | 3378        | 3332         | Cosmetics 1                          | 3            | 2            | 2         |          | Fourth year / 3 | Spring    |
| 6                   | 3377        | 3332         | Pharmaceutical Technology 1          | 3            | 2            | 2         |          | Fifth year / 4  | Fall      |
| 7                   | 3583        | 3562         | Biotechnological drug design         | 3            | 2            | 2         |          | Fifth year / 4  | Fall      |

| Serial  | Course Code | Prerequisite | Course Title                           | Credit Hours | Weekly Hours |           |          | Year / Level*  | Semester* |
|---|-------------|--------------|--|--------------|--------------|-----------|----------|----------------|-----------|
|   |             |              |  |              | Theoretical  | Practical | Tutorial |                |           |
| 8   | 3286        | 3221         | Complementary and alternative medicine | 3            | 2            | 2         |          | Fifth year / 4 | Fall      |
| 9   | 3786        | 3774         | Pharmacotherapy 5                      | 3            | 2            | 2         |          | Fifth year / 4 | Fall      |
| 10  | 3787        | 3720         | Sales and Budget Management            | 3            | 2            | 2         |          | Fifth year / 4 | Fall      |
| 11  | 3387        | 3332         | Pharmaceutical Technology 2            | 3            | 2            | 2         |          | Fifth year / 4 | Fall      |
| 12  | 3388        | 3332         | Cosmetics 2                            | 3            | 2            | 2         |          | Fifth year / 4 | Fall      |
| 13  | 3593        | 3562         | Biotechnological drug production       | 3            | 2            | 2         |          | Fifth year / 4 | Spring    |
| 14  | 3296        | 3221         | Production of medicinal plants         | 3            | 2            | 2         |          | Fifth year / 4 | Spring    |
| 15  | 37960       | 3774         | Pharmacy Skills                        | 3            | 2            | 2         |          | Fifth year / 4 | Spring    |
| 16  | 3797        | 3720         | Pharmaceutical Marketing Skills        | 3            | 2            | 2         |          | Fifth year / 4 | Spring    |
| 17  | 3397        | 3332         | Pharmaceutical Technology 3            | 3            | 2            | 2         |          | Fifth year / 4 | Spring    |
| 18  | 3398        | 3132         | Quality control for cosmetics          | 3            | 2            | 2         |          | Fifth year / 4 | Spring    |
| C- University Requirements (Core program) Mandatory Courses |             |              |  |              |              |           |          |                |           |
| 1   | 0111        |              | Academic English writing 1             | 1            |              |           | 2        |                |           |
| 2   | 0211        |              | Perception actuality                   | 1            |              |           | 2        |                |           |
| 3   | 0122        | 0111         | Academic English writing 2             | 1            |              |           | 2        |                |           |
| 4   | 0233        |              | Communication through art              | 1            |              |           | 2        |                |           |
| 5   | 0411        |              | Sustainable development                | 1            | 1            |           |          |                |           |
| 6   | 0371        |              | Philosophy                             | 1            | 1            |           |          |                |           |
| 7   | 0113        |              | German language 1                      | 1            |              |           | 2        |                |           |
| 8   | 0266        |              | Art creative processes                 | 1            |              |           | 2        |                |           |
| 9   | 0156        |              | Creativity and entrepreneurs           | 1            |              |           | 2        |                |           |
| 10  | 0382        |              | Human rights and politics              | 1            | 1            |           |          |                |           |
| 11  | 0269        |              | Culture and history                    | 1            | 1            |           |          |                |           |

| Serial   | Course Code | Prerequisite | Course Title                   | Credit Hours | Weekly Hours |           |          | Year / Level* | Semester* |
|--|-------------|--------------|--------------------------------|--------------|--------------|-----------|----------|---------------|-----------|
|  |             |              |                                |              | Theoretical  | Practical | Tutorial |               |           |
| 12   | 0157        |              | Arabic Literature              | 1            |              |           | 2        |               |           |
| D- University Requirements (Core program) Elective courses** |             |              |                                |              |              |           |          |               |           |
| 1  | 0222        |              | Diversity interaction          | 1            |              |           | 2        |               |           |
| 2  | 0244        |              | Practicing individual Presence | 1            |              |           | 2        |               |           |
| 3  | 0255        |              | Multi-focus to Art             | 1            |              |           | 2        |               |           |
| 4  | 0124        | 0113         | German language 2              | 1            |              |           | 2        |               |           |
| 5  | 0155        |              | Communication skills           | 1            |              |           | 2        |               |           |
| 6  | 0383        |              | Psychology                     | 1            | 1            |           |          |               |           |
| 7  | 0422        | 0111         | Deep Ecology                   | 1            | 1            |           |          |               |           |
| 8  | 0260        |              | Egyptology                     | 1            | 1            |           |          |               |           |
| 9  | 0363        |              | Research Methodology           | 1            |              |           | 2        |               |           |
| 10   | 0364        |              | Sociology                      | 1            | 1            |           |          |               |           |
| 11   | 0277        |              | Consciousness Development      | 1            |              |           | 2        |               |           |
| 12   | 0381        |              | Principles of law              | 2            | 2            |           |          |               |           |
| 13   | 0484        |              | Biology                        | 1            | 1            |           |          |               |           |
| 14   | 0485        |              | Evolution                      | 1            | 1            |           |          |               |           |
| 15   | 0288        |              | Art project                    | 1            |              |           | 2        |               |           |
| 16   | 0331        |              | Nutrition <sup>#</sup>         | 1            | 1            |           |          |               |           |

\* According to study plan of regular students.

\*\* According to students preferences considering prerequisite courses and university requirement department (core program) study plan.

<sup>#</sup> Added to university requirement courses starting from academic year 2017/2018

(University council number 25 (12/7/2018))

## 5. Courses Contents:

As mentioned in courses specifications and bylaw.

## **6. Program Requirements (according to Bylaws):**

Heliopolis University fully complies with the admission regulations of the Private Universities Council of the Ministry of Higher Education (HUSD). HUSD receives students twice a year; in the fall and spring semesters. Students must apply for admission during the official application period, which is announced by the University's Admission Office. Students applying for admission at a University faculty must meet the following requirements:

- 1- Should be Egyptian. Non-Egyptian students can also be accepted according to the related rules.
- 2- Must be graduated from the general secondary school or equivalent. Students join faculties through a competitive process, based mainly on the results of the secondary school Final Exam. It is also possible for graduate students to apply for admission.
- 3- Should pass the Admission Exam.
- 4- Must enroll as full-time student; otherwise the student must have permanent permission from his/her workplace to accommodate university attendance Policy.
- 5- All kinds of required fees must be paid in full.

Students wishing to join the faculties based on results of exam certificates as IGCSE or American Diploma or other similar certificates should have studied the courses necessary to allow them be admitted to the respective faculty as well as to have got the minimum grades that are specified by the HUSD that make such certificates equivalent to the general secondary level certificate.

## **7. Graduation requirements (Completion of program):**

### **- Graduation Minimum Credit Hours Required**

The minimum number of credit hours required for graduation as specified in the bylaw is 180 credit hours.

### **- Academic Program Curriculum**

The curriculum of all academic programs in the University includes the following group of courses:

- (a) University requirements (Mandatory Core Program): Is a group of 12 credit hours courses to develop the personality of students. They must be completed by all students as part of the graduation requirements for the chosen field of specialization.
- (b) University requirements (Elective Core Program): are 6 credit hours group of designated courses that students can select from in order to complete the university elective courses requirements in their program.
- (c) Faculty Requirements: are offered by the faculty council and approved by the University Council. These requirements include a number of credit hours distributed over mandatory (153 credit hours) and elective ( 9 credit hours) courses as specified by the faculty bylaw.

## - Evaluations and Grades

Course Grade Points are calculated by the number of credit hours required for the course multiplied by the points corresponding to the final mark of the relevant course.

The cumulative GPA is calculated by dividing the Grade Point total by the total number of credit hours earned for all courses of the academic program, excluding the failed courses. In calculating the cumulative GPA, decimals beyond 2 places are truncated, and afterwards rounded up to one decimal place. The GPA may range from 0.0 to a 4.0.

The following table indicates how to convert a percentage into a 4.0 Grade Point Average (GPA).

| Grade | Percentage range  | Points |
|-------|-------------------|--------|
| A     | From 93% to 100%  | 4      |
| A-    | From 90% to < 93% | 3.7    |
| B+    | From 87% to <90%  | 3.3    |
| B     | From 83% to <87%  | 3.0    |
| B-    | From 80% to <83%  | 2.7    |
| C+    | From 77% to <80%  | 2.3    |
| C     | From 73% to <77%  | 2.0    |
| C-    | From 70% to <73%  | 1.7    |
| D+    | From 67% to <70%  | 1.3    |
| D     | From 63% to <67%  | 1.0    |
| D-    | From 60% to <63%  | 0.7    |
| F     | Less than 60%     | 0.0    |

## -Academic Honor

Students with a cumulative GPA of 3.5 and above are included in the honor list, if the student has not failed in any course during his/her study in the university and finished not less than 70% of the program requirements in the University.

## - Degree Requirements

Students awarded the Bachelor of pharmaceutical sciences and drug technology after completing the following requirements:

1. The fulfillment of the minimum 180 credit hour in the program study plan as specified in the curriculum.
2. Achieving a final GPA grade of at least 2.0 in order to be awarded the relevant degree.



## 8. Assessment methods of the program:

| Assessment method             | ILOs being assessed   |
|-------------------------------|---|
| Written examination           | Knowledge and understanding<br>Intellectual   |
| Oral examination              | Knowledge and understanding<br>Professional and Practical<br>Intellectual<br>General and transferable |
| Practical examinations        | Professional and Practical<br>Intellectual<br>General and transferable                                |
| Assignments and presentations | Knowledge and understanding<br>Professional and Practical<br>Intellectual<br>General and transferable |
| Project                       | Knowledge and understanding<br>Professional and Practical<br>Intellectual<br>General and transferable |

## 9. Program Evaluation Methods:

|   | Evaluator                       | Method  | Sample                |
|---|---------------------------------|---|-----------------------|
| 1 | Senior Students                 | Questionnaire and brain storming                          | 40 %                  |
| 2 | Alumni                          | Questionnaire   | 20 -30                |
| 3 | Stakeholders                    | Questionnaire, meetings and discussions                   | Representative sample |
| 4 | External evaluator              | Provide reports after site visit and document examination | 1                     |
| 5 | Internal evaluators for courses | Provide reports after document examination                | 1                     |
| 6 | External examiner               | Provide reports after examination                         | Committee             |

### Program Coordinator and Faculty Dean:

**Name: Prof. Dr. Gouda Helal**

Signature: 

Date: 25/9/2017

Prepared concerning NAQAAE form No. 13