



Mansoura University



Faculty of Pharmacy



Clinical Pharmacy Program Specification

Clinical Pharmacy Program

Ministry Approval Date: 3008

6/11/2007

Program Administration Committee's Approval date:

Faculty Council Approval Date:

Program Specification Bachelor of Pharmacy

Faculty: Pharmacy

A-Basic Information:

- | | | |
|---|-------------------------------|---|
| 1 | Program Title: | Bachelor of Pharmacy (Clinical Pharmacy) |
| 2 | Program Type: | Single |
| 3 | Department(s): | <ol style="list-style-type: none">1. Pharmaceutics (PT)2. Pharmacognosy (PG)3. Pharmacy Practice (PP)4. Pharmacology and Toxicology (PO)5. Microbiology and Immunology (PM)6. Pharmaceutical Analytical Chemistry (PC)7. Pharmaceutical Organic Chemistry (PC)8. Medicinal Chemistry (PC)9. Biochemistry (PB) |
| 4 | Coordinator: | Clinical Pharmacy Program Co-ordinator |
| 5 | External Evaluator(s): | |
| 6 | Approval Date | |

A-Professional Information:

1. Program Aims:

Mansoura University awards Bachelor of Pharmacy (Clinical Pharmacy) degree following a five-year undergraduate Pharmacy program. This Pharmacy program provides students with the necessary knowledge and skills in basic, pharmaceutical, medical, social, behavioral, health, environmental sciences, clinical pharmacy and pharmacy practice and management; aiming to graduate competent general practitioner pharmacists; capable of working effectively in different settings, including community pharmacies, hospitals, forensic and biomedical laboratories, governmental health institutions, pharmaceutical industries, academia and research centers. Graduates are talented to:

1. Fulfill the needs of the local and regional market, and bear responsibilities at work place, in compliance with the pharmacy laws and legislations, and with the ethical and professional rules and the community values.
2. Handle safely and prudently chemicals and pharmaceutical products and participate in systems for prescribing, dispensing, storing and distribution of medications.

3. Practice effectively the good manufacturing, good laboratory, and good safety principles to assure the quality of raw materials, procedures and pharmaceutical products.
4. Deliver patient care in hospital and community pharmacies; and promote rational, safe and effective use of medication in pharmacy practice settings.
5. Collaborate actively with other health care professionals in health education of the public, and in prevention and management of diseases, by providing drug information and preventive health care systems to the community.
6. Perform research at competitive level, using appropriate evidence-based methodologies, and in compliance with the academic standards.
7. Develop presentation, marketing, promotion, business administration and information technology skills.
8. Conduct effective communication, time management, critical thinking, problem solving, decision-making, team-working, performance appraisal and self-assessment.
9. Commit to educate and train the upcoming generation of pharmacists, and to assure and improve the quality of health care of the society.
10. Oblige to life-long learning for continuous professional improvement.

2. Intended Learning Outcomes (ILOs)

a. Knowledge and Understanding:

By the completion of this program the student should be able to:

- a1 Recall the principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice.
- a2 Define the physico-chemical properties of various natural and synthetic substances used in preparation of medicines and the properties of different pharmaceutical dosage forms.
- a3 List the principles of different analytical techniques, using good laboratory practice (GLP) guidelines and validation procedures.
- a4 Describe the theories of isolation, synthesis, purification, identification and standardization methods of chemicals and pharmaceutical compounds; as well as the fundamentals of drug design and development.
- a5 Identify the structure-activity relationship of group of pharmaceutical compounds.
- a6 Memorize the principles of operation of various instruments and techniques including manufacturing, packaging, labeling and storing processes in pharmaceutical industry.

- a7** Utilize and implement the basics of pharmacokinetics and biopharmaceutics and their application in therapeutic drug monitoring (TDM), dose modification and bioequivalence studies.
- a8** Distinguish appropriate good manufacturing practice (GMP) and Quality Control (QC) criteria to aseptic and sterile production facilities and other pharmaceutical industry.
- a9** Describe properties of different pharmaceutical dosage forms including novel drug delivery systems and radiopharmaceuticals.
- a10** Describe the principles of clinical, community and hospital pharmacy, including I.V. admixtures, total parenteral nutrition (TPN) and drug distribution system.
- a11** Discuss the principles of immunology, public health, sources of infection, control of microbial contamination, sanitation, disinfection, sterilization methods and microbiological QC of pharmaceutical products.
- a12** Define the principles of body function in health and diseases states; as well as the etiology, epidemiology, laboratory diagnosis, clinical features of different diseases; and their pharmacotherapeutic approaches.
- a13** Describe the role of new techniques, pharmaceutical trends and biotechnology in the discovery of new remedies.
- a14** Classify the pharmacological properties of drugs including mechanism of action, therapeutic uses, doses, biotransformation, contraindications, adverse drug reactions and drug interactions.
- a15** Summarize the principles of therapeutic, pharmacovigilance and the rational use of drugs.
- a16** List the bases of nutrition, phytotherapy, complementary and alternative medicines and quality control of herbal drugs.
- a17** Discuss the toxic profile of various drugs and other xenobiotics including sources, identification, symptoms, management and control and first aid measures.
- a18** Use the methods of statistical analysis and pharmaceutical calculations.
- a19** Illustrate the principles of drug information, drug promotion and pharmacoeconomics and the principles of sales, marketing, business administration, accounting and management including financial and human resources.
- a20** State the regulatory affairs, pharmacy laws and ethics of pharmacy profession and health care.
- a21** Define the proper pharmaceutical and medical terminology, abbreviations and symbols in health reports and pharmacy practice.

a22 Recognize principle guidelines for treatment and management of various disorders associated with gastrointestinal, cardiovascular, respiratory systems, dermatological and pediatric diseases and oncology.

b. Intellectual Skills:

By the completion of this program the student should be able to:

b1 Apply principles of pharmaceutical knowledge in formulation of safe and effective medicines and dealing with new drug delivery systems.

b2 Recommend good manufacturing practice (GMP), good laboratory practice (GLP), good clinical practice (GCP) and good safety practice (GSP) guidelines in pharmaceutical technology, pharmaceutical research and pharmacy practice.

b3 Determine suitable qualitative and quantitative analytical and biological methods of analysis and QC of drugs as raw material, in dosage forms and in biological fluids.

b4 Predict possible incompatibilities and other prescription-related problems that may occur during drug dispensing.

b5 Design appropriate methods for isolation, synthesis, purification, identification and standardization of various natural compounds, chemicals and pharmaceutical compounds.

b6 Apply the principles of bioinformatics and computer-aided tools and molecular modeling programs in the design of new molecular entities.

b7 Specify clinical pharmacy practice requirements in prescribing drugs and handling of biopharmaceutical and other biotechnology products.

b8 Develop appropriate methods for infection control and promote public health awareness.

b9 Appraise the pharmacotherapeutic principles in the proper selection and use of drugs in various disease conditions.

b10 Adjust dosage and dose regimen of medication based on pharmacokinetic principles.

b11 Assess possible drug interactions, adverse drug reactions and other drug-related problems, as essential issues in clinical pharmacy practice.

b12 Promote cost/effective pharmacotherapy by applying principles of drug information and pharmacoconomics.

b13 Interpret experimental data and published literatures, based on relevant chemical, pharmaceutical, statistical principles.

b14 Evaluate evidence-based information needed in pharmacy practice decisions.

b15 Estimate social health hazards and drug abuse, misuse and exposure to toxic agents.

- b16** Predict the physical and chemical properties and biological activity of organic compounds based on molecular structure.
- b17** Formulate a systemic approach for the laboratory diagnosis of common clinical conditions and for identification of causative agents and organisms.
- b18** Correlate histological, physiological and pathological structure with the function of the human body; and integrate basic anatomical, biochemical and physiological facts with clinical data.
- b19** Analyze herbal drugs for the purpose of determination of adulteration to control quality of produced pharmaceutical agents.
- b20** Design a systemic approach for pharmacological and non-pharmacological management of gastrointestinal, cardiovascular, respiratory, dermatological, pediatrics' diseases and oncology.

c. Professional and Practical Skills:

By the completion of this program the student should be able to:

- c1** Utilize the proper pharmaceutical and medical terminologies, to communicate with other health care professionals.
- c2** Handle and dispose hazardous chemicals, biological and pharmaceutical preparations safely.
- c3** Employ proper and safe dispensing, dispersing, labeling, distribution and storing of medicines, natural and synthetic chemicals and pharmaceutical preparation.
- c4** Apply appropriate methods for extraction, isolation, synthesis, purification, identification and standardization of active substances from different origins.
- c5** Prescribe medications based on proper understanding of etiology and pathophysiology of diseases, and drug chemistry.
- c6** Monitor and control microbial infections, and carry out laboratory tests for diagnosis of various diseases.
- c7** Assess toxicity profiles of different xenobiotics and detect toxins in various biological samples.
- c8** Manage pharmaceutical instruments and equipment safely and efficiently and solve commonly encountered problems in pharmaceutical manufacturing processes.
- c9** Persuade public awareness on rational use of drugs and social health hazards of drug abuse and misuse.
- c10** Counsel patients when dispensing OTC and prescription drugs to ensure safe and proper use of medicines.
- c11** Conduct experimental and research studies and present, analyze and interpret the results.
- c12** Employ proper documentation and drug filing system

- c13 Assess risks concerning drug-drug interaction, adverse reaction and incompatibilities in different pharmaceutical preparations.
- c14 Employ different qualitative and quantitative chemical and biological methods for quality control (QC) and assay of raw materials as well as sterility of pharmaceutical preparations.
- c15 Analyze the economic principles, and estimate costs and profits in a given process.
- c16 Utilize legal and ethical guidelines to ensure correct and safe supply of medical products to the general public.
- c17 Apply the concepts of clinical pharmacy and pharmaceutical care in different pharmacy practice settings.
- c18 Apply the rules and regulations governing the practice of pharmacy.
- c19 c8 Explain behavior and relationships between individuals and their family/ partners, immediate social groups and society on large scale
- c20 Formulate pharmaceutical care plans for patients suffering from different disorders with reference to their particular health issues and special considerations.

d. General and Transferable Skills:

By the completion of this program the student should be able to:

- d1 Communicate clearly by verbal and written means with patients and other health care professionals.
- d2 Retrieve and critically evaluate pharmaceutical information and clinical laboratory data from different sources to improve professional competencies.
- d3 Interact effectively in team working.
- d4 Exploit calculations and statistical methods as well as information technology (IT) tools.
- d5 Practice independent learning needed for continuous professional development.
- d6 Adopt professional ethical, legal and safety guidelines in pharmacy practice.
- d7 Develop management, financial, sales and marketing skills.
- d8 Present information clearly in written, electronic and oral forms.
- d9 Promote critical thinking, problem-solving, decision-making, and time managing capabilities.
- d10 Support patient, pharmaceutical and health care.
- d11 Plan strategies to fulfill workplace pharmaceutical needs.

3-Academic Standards

3a-External References for Standards (Benchmarks)

The Faculty of Pharmacy-Mansoura University adopts the National Academic Reference Standards in Pharmacy education, issued by National Authority for Quality Assurance and Accreditation of Education (NAQAAE) in Jan 2009. **(Attachment # 1).**

3b-Comparison of provision to External References

- A. Comparison of Program Aims and the Intended Learning Outcomes (ILOs) with the National Academic Reference Standards (NARS)**(Attachment # 2).**
- B. Matrix of the courses with the Program ILOs **(Attachment # 3).**

4-Curriculum Structure and Contents

4a	Program duration	5 years					
4b	Program structure	195 Hours					
4b.i	No. of hrs per week:	Lectures	139	Lab./Exercise	56	Total	161
4b.ii	Practical/Field Training:	100 hours of clinical training in hospital settings and specialized Mansoura University Centers 200 hours summer training in pharmaceutical settings; including pharmacies and pharmaceutical companies					

Clinical Pharmacy Program complies with NARS's guidelines NARS (2009) in its curriculum. Comparison between the curriculum structure of Clinical Pharmacy Program, and the structure of a Pharmacy Curriculum allocated by the NARS is included **(Attachment # 4).**

5- Programme Courses:

To obtain a bachelor's degree in pharmacy (Clinical Pharmacy), the student is required to study 195 credit hours. The Faculty has issued a study plan, where courses are distributed over ten semesters (five levels). The following two tables illustrate the distribution of credit hours and courses on the different requirements and academic levels. A detailed distribution of the courses, along with their credit hours, prerequisites, exam marks and exam time is included **(Attachment # 5)**

	Credit Hours
University Requirements	9
Faculty Compulsory courses	182
Faculty Elective Courses	6
Practical/Field Training: (300 hours)	100 hours of clinical training in hospital settings and specialized Mansoura University Centers under academic supervision 200 hours summer training in pharmaceutical settings; including pharmacies and pharmaceutical companies approved by Faculty's Council Under supervision of Staff Members
Total	195 credit hours

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Program course Levels (in credit-hours system):

Level	Semester	Lectures	Practical	Total
1	1	13	6	17
	2	14	5	19
2	3	14	5	19
	4	12	6	18
3	5	14	5	19
	6	14	6	20
4	7	15	5	20
	8	15	6	21
5	9	14	7	21
	10	14	7	21
Total		139	56	195

Curriculum Contents:

- Courses' Description are included (Attachment # 6), and course's specification are reviewed and approved by Faculty of Pharmacy's Council and are available at both program administration and Quality Assurance Unit – Faculty of Pharmacy – Mansoura University.
- Clinical training schedule are announced per semester after approval of the higher committee of the program and is offered for level 4 students. Clinical training is held after coordination with the specialized medical centers and hospitals, Mansoura University.
- Students are arranged into small groups (10-15 students and each groups has 2 supervisors from Faculty of Pharmacy and Faculty of Medicine Mansoura University).
- Partners in clinical training include but not limited to: Mansoura General University Hospital, Mansoura Oncology Center, Emergency Hospital, Pediatrics Hospitals, Nephrology and Urology Center, Gastroenterology Hospital - Mansoura University and Mansoura New General Hospital.

6-Programme Admission Requirements

- The Faculty complies with the admission regulations and requirements of the Egyptian Supreme Council of Universities (SCU).
- Nominated students must hold the Egyptian high school general certificate (Scientific Section), or an equivalent certificate accepted by the SCU.
- Foreign students are nominated for admission to the faculty according to the general regulations of the Ministry of Higher Education.

- Students from other governmental Egyptian universities or foreign scientific institutes recognized by the Supreme Council of Universities must fulfill the faculty of pharmacy admission requirements and internal regulations before being transferred to our Faculty.
- All Students must fulfill all requirements and comply with the rules of admission to the Faculty.
- Full-time study is mandatory for all students.
- 10% of the newly admitted students to level 1 at Faculty of Pharmacy are allowed to join the program so that the total number of the students joining the program in its different academic levels does not exceed 20% of the total number of students in the different academic levels in the regular program.
- The Program's administration board proposes the number of the yearly accepted students and the proposed number is officiated and approved by the Faculty of Pharmacy Council. A number of seats is reserved for students holding equivalent certificates, American Diplome (SAT) and British diplome (GRE) according to the regulation of Ministry of Higher Education.
- Students holding equivalent degrees are offered places based on the proportion applying holding each degree.
- Whenever the number of students exceeds the pre-approved numbers, criteria of selection are applied including:
 - 1- The score of high school general certificate
 - 2- Whenever students achieve the same score, marks in both biology and chemistry are added to the total score and students are arranged.
 - 3- Whenever students achieve the same score after inclusion of biology and chemistry, English marks are added to the score and students are arranged.
- For students who acquired an equivalent certificate issued from other foreign countries approved by the Ministry of Higher Education, an English exam is held to arrange the students according to their scores in English exam.
- Students holding SAT and GRE degrees are approved for admission after arranging them according to scores obtained in the certificate exam.
- STEM students are allowed to join the program as separate entity.

7-Regulations for progression and program completion

- The Faculty adopts the Credit Hour System in this program.
- Student registers the courses in each semester with the guidance and approval of his/her academic advisor, taking into consideration the prerequisite of each course and extent of academic progress of the students.
- Groups of students in academic supervision for each academic advisor range from (25-30 students).
- Each student is allowed to register a total of 12 to 22 credit hours in each semester; while the academic load during summer semester is 4 – 10 credit hours.
- Students who achieve CGPA less than 1 for successive 6 semesters or separate 10 semesters are exempted from the faculty after Faculty council approval. Students with such problems are given academic alerts regularly
- Students who exceed the aforementioned limits are allowed one final; chance to adjust their cGPA before being exempted after approval of the higher committee of the program.
- Students achieving GPA less than 1 are not allowed to register more than 12 credit hours of the previously studied courses.
- Students achieving GPA (1-1.5) are allowed to register 15 credit hours.
- Students in the fifth academic year are allowed to register an overload of credit hours, not exceeding 4 credit hours divided on both graduation semesters after approval of his/her academic advisor and higher committee of the program and the student is required to successfully pass 149 credit hours to be qualified for overload registration. The student is not allowed to register the second overload course unless he passes the first overload.
- Students must attend not less than 75 % of the lectures and lab. Sessions. Otherwise, they would not be able to attend the final exam and complete the course.
- Progression into a higher level requires that the student should successfully complete around 20 % of the total credit hours.

Academic Level	Number of credit hours exceeded
Level 1	36 credit hours
Level 2	37-73 credit hours
Level 3	74-112 credit hours
Level 4	113-153 credit hours
Level 5	Above 153 credit hours

- Completion of the program requires that the student must successfully complete 195 credit hours, in addition to acquiring 200 hours of summer training in a pharmaceutical establishment/setting or equivalent (community or hospital pharmacies, pharmaceutical firms or research institutes and universities) and 100 hours clinical training in a specialized clinical training setting.
- Student transferred from other institutions must study at Mansoura University at least 60% of graduation requirements.
- Grading of the Human Rights course is not included in the cumulative GPA (cGPA).

8. Student assessment:

- Methods of assessments include semester, final written oral and practical examination. Research paper, course assignments, presentation are examples of self learning tools adopted to promote quality of learning and to implement unconventional learning tools besides library exercise and practical work.
- Midterm exam is held after the 6th week of each semester
- Practical exams are at the 12th week
- Final written and oral exams are held from week 13-15 of the semester
- Each course is assigned a total of 100 points (marks); 73 courses besides human right course

Courses	No. of courses	Percentage	Midterm exam marks	Practical exam marks	Oral exam marks	Written exam marks	Total marks
Courses with midterm, practical, oral and written exams	52	71.00%	10	25	15	50	100
Courses with midterm, oral and written exams	5	7.0%	10	--	15	75	100
Courses with midterm and written exams	11	15 %	10	--	--	90	100
Courses with midterm, practical and written exams	5	7.0%	10	25		65	100
	73	100					

- Performance of a student is measured by the **Grade point average (GPA) value** he/she scores in an individual course, (Attachment, 7).
- Student assessment methods help to evaluate the ILOs of each course as follows:

Exam	Skills assessed
Written exams (Midterm and Final)	<ul style="list-style-type: none">• knowledge, understanding,• intellectual skills, and• professional skills
Oral exams	<ul style="list-style-type: none">• knowledge, understanding,• intellectual skills,• professional skills and• general transferable skills
Practical exams	<ul style="list-style-type: none">• practical skills

10- Evaluation of Program Intended Learning Outcomes:

- 1- Annual review of the Program's report
- 2- Feedback of stakeholders
- 3- Feedback of clinical trainers and participants from other participants in teaching staff from other faculties
- 4- Feedback of students and graduates
- 5- Reports of reviews of internal and external evaluators.
- 6- Reports of annual review boards and committees.

Program Coordinator

Signature

Faculty Council Approval: