General Program Specifications

University: Beni Suef

Faculty: Pharmacy

Department: General program

Program Specifications

(Year 2014-2015)

A- Basic information:

1- Program Name: Bachelor in Pharmaceutical Sciences

2- Program type: Single

3- Department (s): General program

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

4- Last date of program specification approval:

B- Specialized information:

1. Program Aims:

This program aims to:

1.1. Apply effectively the laws and legislations in handling, storage and distribution of the chemicals and pharmaceutical products.

1.2. Design the various pharmaceutical formulations and participate effectively in aspects of the drug industry.

1.3. Analyze qualitatively and quantitatively the raw materials and pharmaceutical preparations to assure their quality.

1.4. Manage the community and hospital pharmacies, provide information to patients and communicate with other health care professionals about the common health problems.

1.5. Setup a research plan using suitable methods and illustrate problem solving, team working and presentation skills.

1.6. Identify the patho-physiology of diseases and distinguish the various plants and herbs with medicinal effects.

2. Intended Learning Outcomes (ILOs):

By the end of the program the graduate should be able to:

2.1. Knowledge and Understanding:

a1. Recognize principles of basic, medical, social, behavioral, management, health, language, pharmaceutical laws and environmental sciences**.**

a2. Recognize structure, isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds.

a3. Practice different analytical techniques for determination identification and / or quantification of pharmaceutical substances.

a4. Distinguish physico-chemical properties of various substances used in preparation of pharmaceutical preparations either inactive or active ingredients which may be natural, synthetic, semi-synthetic, or biotechnology of non- or radio-labeled products.

a5. Test different factors affecting stability, safety and activity of different pharmaceutical ingredients.

a6. Plan principles of drug design, development and synthesis.

a7. Evaluate different pharmaceutical compounds using GLP guidelines and validation procedures.

a8. Identify the different metabolic pathways in human body.

a9. Demonstrate the understanding of the structure and functions of the Proteins, hormones, enzymes, minerals, vitamins and various mediators in normal states and different diseases.

a10. Distinguish various biochemical changes associated with specific diseases.

a11. Describe the principles of the nucleic acids and differentiate the molecular biology techniques involved in their investigation.

a12. Demonstrate various instruments and techniques including sampling, manufacturing, packaging, labeling, storing and distribution processes in pharmaceutical industry.

a13. Formulate different pharmaceutical dosage forms including novel drug delivery systems.

a14. Evaluate principles of pharmacokinetics and biopharmaceutics with applications in therapeutic drug monitoring, dose modification and bioequivalence studies.

a15. Select principles of hospital pharmacy including I.V. admixtures, TPN and drug distribution system.

a16. Recognize etiology, epidemiology, laboratory diagnosis, clinical features and management of different infections and diseases.

a17. Explain 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.

a18. Demonstrate different mechanisms of microbial resistance and the structure and the growth conditions of the causative agents of the infectious diseases.

a19. Differentiate between the different groups of chemotherapeutic agents and the composition of the immune system with immune system disorders.

a20. Measure different sources of microbial contamination and techniques used to control or inhibit the growth of the microorganisms.

a21. Select microbiological quality control of pharmaceuticals.

a22. Recognize methods for medicinal plants selection and differentiation between pharmacopoeial grade, varieties and adulterants.

a23. Describe suitable herbal products for different cases taking in consideration the patient disease history.

a24. Practice the macro-& micro-morphological and chemical methods for detection and identification of naturally occurring drugs.

a25. Identify diverse naturally occurring drugs, their chemical classes, mode of action, pharmacological importance and their clinical usefulness.

a26. Discuss the morphological and histological characters of drugs derived from plants, their active constituents, medicinal uses and chemical test.

a27. Compare different methods of collection, drying, packing and preservation of medicinal plants.

a28. Inspect the different methods of adulteration detection of natural drugs ensuring their purity.

a29. Interpret pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications and adverse drug reactions.

a30. Illustrate principles of clinical pharmacology, pharmacovigilance and the rational use of drugs.

a31. Compare between complementary and alternative medicines.

a32. Estimate toxic profile of drugs and other xenobiotics including sources, identification, symptoms, management control and first aid measures including the provision of initial care for different illnesses or injuries.

a33. Design methods of biostatistical analysis and pharmaceutical calculations to explain methods of screening and bioassay of different classes of drugs.

a34. Score principles of management including financial and human resources.

a35. Plan principles for drug promotion, sales and marketing, business administration, accounting and pharmacoeconomics.

a36. Revise principles of proper documentation and drug filing systems.

a37. Judge regulatory affairs, pharmacy laws and ethics of health care and pharmacy profession.

2.2. Intellectual Skills:

b1. Prepare formulations for safe and effective medicines.

b2. Design novel and efficient drug delivery systems.

b3. Apply GLP, GPMP, GSP and GCP guidelines in pharmacy practice.

b4. Apply qualitative and quantitative analytical and biological methods for QC and assay of raw materials and pharmaceutical preparations.

b5. Identify physical and/or chemical properties of different compounds and the possible incompatibilities that may occur during drug dispensing.

b6. Handle properly the incompatibilities that may occur during drug dispensing.

b7. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.

b8. Employ the principles of bio-informatics and computer-aided tools in drug design.

b9. Evaluate methods applied for infection control and public health protocols.

b10. Apply biological, physical and chemical methods in optimization of microbial primary and secondary metabolites production.

b11. Apply pharmacological and biochemical principles in diagnosis and optimization of treatment of various disease conditions.

b12. Apply pharmacokinetic principles in dosage and dosing regimen adjustment and optimization.

b13. Identify drug-drug interactions and ADRs of prescribed medications.

b14. Apply the principles of pharmacoeconomics in promoting cost/effective pharmacotherapy.

b15. Interpret findings related to pharmacy practice that is published in literature.

2.3. Skills

2.3.1. Practical and Professional Skills:

c1. Identify the accurate using of medical terms, abbreviation and symbols in pharmacy practice.

c2. Select the proper analytical techniques for qualitative and quantitative determination of compounds in pharmacy practice.

c3. Select the methods of handling of chemical and pharmaceutical preparation safely.

c4. Determine the ways of disposing chemical and pharmaceutical preparation safely.

c5. Score the compounds, labels, storing and distribution of medicines in effective and safe way.

c6. Identify active substance from different origins.

c7. Determine the medicines as a result of knowledge of etiology and pathophysiology of diseases.

c8. Synthesize or discover active substances from different origins.

c9. Identify the infectious and non-infectious diseases depending on microbial growth and laboratory tests.

c10. Monitor infectious incidence, prevalence, mortality and morbidity of diseases.

c11. Utilize techniques to operate pharmaceutical equipment and instruments.

c12. Retain public awareness on rational, irrational and social health hazards use of drugs.

c13. Recommend patients and health care professionals to the appropriate use of drugs.

c14. Perform research studies to get meaningful results.

c15. Provide suitable documentation and drug filing systems.

2.3.2. General and Transferable Skills:

d1. Apply proper verbal and written means in communications.

d2. Collect and rate data from different sources to upgrade or ameliorate professional skills.

d3. Work effectively in a team during experimental work to retrieve data or to produce proper presentations/ reports.

d4. Apply proper numerical, calculation, statistical methods in addition to correct use of different information technologies.

d5. Proper application of different information technology tools to improve different professional skills.

d6. Implement independent learning to gain extended professional abilities.

d7. Apply ethical, legal and safety guidelines in different practical aspects.

d8. Improve financial sales as well as marketing skills.

d9. Establish appropriate distinctive creativity and time management competencies.

d10. Use applicable writing as well as well presentation skills.

d11. Determine proper critical thinking, problem solving in addition to decision making competencies.

3. Academic standards: National Academic References (NARS)

4. External references for standards (Benchmarks)

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5. Curriculum Structure and Contents:

a) program duration : Five years divided in 10 semesters

b) program Structure:

• No of hours per week :	Lectures	12-14	Lab./Exercise	9- 15	Total	21-29
	Compulsory	166	Elective	2	Optional	0

• Basic sciences Courses :	32	19 %
• Social sciences and humanities courses:	16	9 %
• Specialized courses:	118	71 %
• Other Courses :	2	1 %

• Practical/field training:	There is field training of not less than 300 hours in summer vacation that precedes third, fourth or fifth years.

c) Program Levels (in credit-hours system): Not Applicable

Compulsory	166	Elective	2	Optional	0

d) Program Courses:

a. Compulsory :

Code No.	Course Title	No. of Units	No. of hours/week		Level	Semester
			Lect.	Lab.		
101	Pharmacy orientation + History of Pharmacy		2	0	1	1

201	Botany and Medicinal Plants		2	1	1	1
501	Organic Chemistry 1		3	1	1	1
503	Mathematics		2	0	1	1
601	Physical Chemistry + General Chemistry		2	1	1	1
602	Analytical Chemistry 1		2	1	1	1
102	Physical Pharmacy		2	1	1	2
104	Information Technology		1	1	1	2
105	Business Administration		2	0	1	2
202	Pharmacognosy 1		2	1	1	2
502	Organic Chemistry 2		2	1	1	2
603	Analytical Chemistry 2		2	1	1	2
103	Pharmaceutics 1		2	1	2	1
203	Pharmacognosy 2		2	1	2	1
301	Medical subjects		3	1	2	1
302	Medical terminology		1	0	2	1
504	Organic Chemistry 3		3	1	2	1
604	Analytical Chemistry 3		2	1	2	1
106	Pharmaceutics 2		3	1	2	2
204	Pharmacognosy 3		2	1	2	2
311	Psychology		1	0	2	2
401	Pathology and Parasitology		2	1	2	2
505	Organic Chemistry 4		2	1	2	2
605	Instrumental analysis		2	1	2	2
107	Pharmaceutics 3		2	1	3	1
205	Phytochemistry 1		3	1	3	1
303	Pharmacology 1		2	1	3	1
402	Microbiology & Immunology		2	1	3	1
701	Biochemistry 1		3	1	3	1
108	Hospital Pharmacy		1	1	3	2
206	Phytochemistry 2		2	1	3	2
304	Pharmacology 2		3	1	3	2
403	Medical Microbiology		3	1	3	2
702	Biochemistry 2		3	1	3	2
114	Community pharmacy + Pharmacy Practice + Pharmacy legislation		3	1	4	1

208	Phytotherapy		2	0	4	1
405	Public Health		1	0	4	1
703	Clinical Chemistry + Molecular Biology		2	1	4	1
801	Medicinal Chemistry 1		2	1	4	1
305	Pharmacology 3 + drug interaction		3	1	4	1
110	Pharmaceutics 4		2	0	4	2
111	Biopharmaceutics		2	1	4	2
306	Bioassay and Biostatistics		2	1	4	2
307	Toxicology		3	1	4	2
308	First aid		1	0	4	2
802	Medicinal Chemistry 2		3	1	4	2
109	Clinical Pharmacy		3	1	5	1
112	Pharmaceutical Technology 1		2	1	5	1
209	Drug marketing		1	0	5	1
405	Pharmaceutical Microbiology		2	1	5	1
803	Medicinal Chemistry 3		3	1	5	1
113	Pharmaceutical Technology 2		3	1	5	2
115	Quality Control and Quality assurance		3	1	5	2
116	Drug information		1	0	5	2
207	Natural Products and Quality Control		3	1	5	2
406	Biotechnology		2	0	5	2

b. Elective

Code No.	Course Title	No. of Units	No. of hours/week		Level	Semester
			Lect.	Lab.		
117	Drug registration		2	0	5	1 or 2
118	Pharmacoeconomics		2	0	5	1 or 2
119	Pharmacy management		2	0	5	1 or 2
120	Law		2	0	5	1 or 2
210	Marine Natural Products		2	0	5	1 or 2
309	Biosafety		2	0	5	1 or 2

310	Veterinary Pharmacy		2	0	5	1 or 2
606	Food analysis		2	0	5	1 or 2
704	Applied Genetic Engineering		2	0	5	1 or 2
705	Clinical nutrition		2	0	5	1 or 2
804	Drug design		2	0	5	1 or 2
805	Drug synthesis		2	0	5	1 or 2

c. Optional: ----------

Code No.	Course Title	No. of Units	No. of hours/week		Level	Semester
			Lect.	Lab.		

6. Courses Contents:

See course specification

7. program admission requirements:

General Secondary School Certificate from Science section (including Biology and Chemistry subjects), or an equivalent certificate from a foreign institute recognized by the university.

A. Admission criteria:

The Faculty accepts the following:

- A satisfactory standard in Chemistry and at least one other science subject, especially Biology.
- School marks of at least 98.5% for the academic year 2011/2012.

8. Regulations for progression and program completion:

To be transferred from one academic year to the next, the student should successfully passed in all subjects or failed in not more than two basic subjects and two complementary ones from the same academic year or previous years. For the student carrying subjects from one year to the next should re-sit for failed subjects in their proper respective semesters. Final year students who have failed

in a maximum of two basic complementary ones in that year or from previous years can re-sit for exams in those subjects in September of the same year. If this student failed again, he has to re-sit for his exams in their proper semesters until he succeeds.

- **First year/Semester 1:** Automatically moved to the second semester.
- **First year/Semester 2:** Pass in all subjects or fail in not more than two compulsive subjects and two subsidiary subjects.
- **Second year/Semester 1:** Automatically moved to the second semester.
- **Second year/Semester 2:** Pass in all subjects or fail in not more than two compulsive subjects and two subsidiary subjects.
- **Third year/Semester 1:** Automatically moved to the second semester.
- **Third year/Semester 2:** Pass in all subjects or fail in not more than two compulsive subjects and two subsidiary subjects.
- **Fourth year/Semester 1:** Automatically moved to the second semester.
- **Fourth year/Semester 2:** Pass in all subjects or fail in not more than two compulsive subjects and two subsidiary subjects.
- **Fifth year/Semester 1:** Automatically moved to the second semester.
- **Fifth year/Semester 2:** Pass in all subjects or fail in not more than two compulsive subjects and two subsidiary subjects. In the latter case, the student is allowed to enter a September exam.
- Student is eligible to the **Honors** degree if his grade is not less than **Very Good** in all years.

❖ **Degree of classification**

- Marks from the first to the fifth year are cumulative so the determination is for overall marks of the degree.
- The final overall marks evaluate the degree of classification as follows:

Mark	Degree
Less than 60%	Fail
At least 60% and less than 65%	Fair
At least 65% and less than 75%	Good
At least 75% and less than 85%	Very Good
At least 85% and more	Excellent

❖ **By laws and regulations for Undergraduate Students:**

Academic year	Enrollment opportunities	
	*Regular Student	*External Student
First	Two opportunities	Non
Second	Two opportunities	Two opportunities
Third	Two opportunities	Two opportunities
Fourth	Two opportunities	Two opportunities
Fifth	Two opportunities	Two opportunities, if the student succeeds in half the number of subjects, he/she is allowed to re-sit for the exam in subjects he/she failed till graduation

*Once the student exhausts the number of opportunities of being a regular student, the student becomes an External student for a certain number of times according to the rules in the above table. Once an External student in a certain year succeeds in his exams for that year to allow him to be transferred to the following year, then the student automatically becomes registered as a regular student again.

9. Assessment methods and rules for evaluation of program students:

No.	Method of assessment	Measurable ILOS
1		
2		
3		
4		
5		

10. Methods of evaluation of program:

No.	Evaluator	Tool	Sample
1	**Senior Students**	Questionnaire	10%
2	**Alumni**	Questionnaire	10%
3	**Stakeholders** **- Business sector** **- Industry sector**	Questionnaire Personal interviews	Approximate sample

4	**External Evaluator(s) (External Examiner(s)) [if any]**	Test reviews	Approximate sample
5	**Others**	Personal interviews	All participants in the program

Program Coordinator: Dr. Maha Mohamed Abdelrahman

Signature:

Date: / /