Program Specification of Master of Pharmaceutical Quality Control

1. Program Introduction/Description

This program combines the study of theories and doing research on a range of pharmaceutical field. The program is designed to prepare students to be leaders in the pharmacy and to provide them with the tools to effectively practice in senior research and teaching position in the field of innovative pharmaceutical research, pharmaceutical quality control research, pharmaceutical assessment, design, analysis of new drug in research institutions, universities and enterprises. Students in this program studying pharmacy-related courses intensively and required to take specialized courses in quality control, pharmaceutical analysis and choose their research's fields and publish it in international journals.

2. Program Identification and General Information

Program Title	Master of Pharmaceutical Quality Control
Total credit hours required to award the degree	39 credit hours
Awarding Institution	Faculty of Pharmacy, Sana'a University
Department	Medicinal, Pharmaceutical Organic and Analytical Chemistry
Other Departments with major Teaching Contributions	-
Language of study	English
Date of Specification Preparation/Revision	
Mode of Study	Courses and thesis
Study System	full time
Main Location of Study	Faculty of Pharmacy
Mode of Delivery	Full time
Study Duration	Full-time (minimum 4 semesters)
Award(s) or Final Award	Master of science (M.S.c) in Pharmaceutical Quality Control
Qualification required to join the program:	- a bachelor's degree in Pharmacy from the Faculty of Pharmacy, Sana'a University or from any of the faculties of Pharmacy in Yemeni universities recognized by Ministry of Higher Education.
Minimum grade requirements to enroll in the program	-
Other admission requirements	- The student must pass English as a Foreign Language (TOEFL) with a condition of no less than 450 or its equivalent as a requirement for admission to the program.
Program coordinator:	Dr. Yahya A.S Al Dokhin.

Approval date:	

3. Program Curriculum Committee:
1 .Dr Yahya A.S Al Dokhin. 2 .Prof. Dr. Tawfeek A. Yahya 3. Dr. Mohamed Abbas.

4. Vision, Mission & Aims of the University
Vision of the University
Sana'a University aspires to achieve a national leading role in teaching, learning, scientific research and community service; and to be among the best regional universities and the foremost house of expertise and think tank in Yemen.
Mission of the University
To contribute to the sustainable development efforts by providing an accredited higher education environment and excellent research services within a fruitful national partnership based on transparency, professionalism and creativity.
Aims of the University
The University seeks to achieve the following objectives:
1. To provide specialized and in-depth academic opportunities for students in different fields of knowledge to meet the country's needs of specialties, technicians and experts, with special focus on the following:
2. To boost the level and quality of preparation and qualification tasks.
3. To create a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.
4. To stabilize the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.
5. To develop innovative and critical scientific thinking skills.
6. To provide students with the required knowledge and scientific and applied skills for solving problems effectively and efficiently.

7. Vision, Mission & Aims of the Faculty
Vision of the Faculty
Excellence and leadership locally, regionally and globally, in providing knowledge and continuous education in the academic and research field in pharmaceutical sciences According to the markets needs and community services
Mission of the Faculty
The College of Pharmacy seeks to prepare scientifically and practically qualified pharmaceutical graduates with high professional ethics and able to compete locally, regionally and globally in providing healthcare services through educational programs in accordance with quality standards that can support national pharmaceutical industries, market needs and serve community.
Aims of the Faculty

1. Providing students with comprehensive knowledge about physiochemical properties and biological activities of medicinal substances required for formulating and preparing pharmaceutical products from their different sources, natural or synthetic.
2. Providing students with opportunities, practical skills, and training in different pharmaceutical sciences to ensure effective contribution in enhancing the requirements **of** pharmaceutical industries and labor market needs to serve the community.
3. Performing students the pharmaceuticals qualitative and quantitative analytical techniques according to GLP and GPMP guidelines to assess the quality and quantity of raw materials from natural or synthetic sources and different pharmaceutical products.
4. Possessing students the core knowledge concerning the principles of pathophysiology of diseases, pharmacotherapy, pharmacovigilence and pharmacoeconomics to be able to participate with other health care professionals in improving health care services using evidence-based
5. Planning, designing and conducting undergraduate and postgraduate research using appropriate methodologies.
6. Developing student's presentation, promotion, pharmaceutical marketing, administration, numeric and computation skills.
7. Demonstrating student's capability of communication skills, time management, critical thinking, problem-solving, decision-making and team-working.
8. Manage the safe and efficient distribution of medications and participate in quality assurance and improvement programs to maintain the sustainability of good practice.
9. Demonstrate a professional attitude through practicing in an ethical, legal manner and according to the GMP and GPP guidelines and continuously maintaining his/her competence through lifelong learning.

8. Mission & Aims of the Department

Mission of the Department

To prepare high professional, ethical, qualified pharmaceutical postgraduates who able to compete locally, regionally and globally in providing healthcare services through excellence education and research study in the field of analysis, and synthesis of raw materials and synthesis, analysis and designing of pharmaceutial compounds.

Aims of the Department

1. Possessing advanced knowledge and practical experience in simple and new methods for synthesis and analysis of raw materials used as starting material for designing and synthesis of pharmaceutical compounds.
2. Providing students with advanced principles and practical experience in modern methods and techniques of pharmaceutical analysis.
3. Enriching advanced knowledge and skills in medicinal chemistry focusing on design, synthesis and biological evaluation of pharmaceuticals.
4. Planning, designing and conducting pharmaceutical research using appropriate methodologies.
5. Perform research studies on specific pharmaceutical active compounds based on applying the scientific basis of research methodologies, ethics and professional practice.

6. Encouraging students for discovering and development of pharmaceutical active substances.
7. Demonstrating communication skills, problem solving, critical thinking and decision making abilities in research field.
8. Comprehending reliably literature in the field research and developments of professionalism and long life learning.
9. Interpreting the work results and information to solve problems.
10. Providing the student with knowledge and skills for writing reports and thesis and publishing papers.

9. Mission & Aims of the Program
Mission of the Program
Preparing qualified students with high professional ethics by providing applied interdisciplinary research in analysis and quality control of the raw materials and pharmaceutical products to meet the needs of the governmental and private health sector, pharmaceutical factories and research centers.
Aims of the Program
1. Enriching students with advanced knowledge regarding drug quality supervision.
2. Designing plans for pharmaceutical research using appropriate methodologies..
3. Conducting pharmaceutical research using appropriate scientific methodologies, ethics and professional practice
4. Demonstrating skills for writing reports and thesis and publishing papers.
5. Developing problem-solving skills and critical thinking ability and apply these in developing the experimental design to obtain the aims of research.
6. Providing the ability to critically review the scientific literature,
7. Developing professionalism and long life learning in pharmaceutical area of interest.

10. Program Standards & Benchmarks [Annex (2)]
Program Standards
• Rules and Regulations of the Ministry of Higher Education and Scientific Research, Yemen.
Program Benchmarks
1- Master in Pharmaceutical Analysis-Quality Control- Faculty of Pharmacy- Athens university- Greece.
2- Master in Medical Product Quality - USC School of Pharmacy - Southern California University- USA
3- Master in Pharmaceutical Analysis and Quality Control- King's Collage - London university- UK.
4- **Master in** Quality Control of Pharmaceutical Products - College of Pharmacy - King Saud University - KSA.
5- Master in Pharmaceutical Quality Control - Faculty of Graduate studies- Jordan University of Science and Technology – Jordan.
6- Master in Pharmaceutical analysis and Quality assurance- Faculty of Pharmacy- university Kart- India .

11. Program Intended Learning Outcomes (PILOs)

A. Knowledge and Understanding Upon successful completion of the Master of pharmaceutical quality control Program, graduates should be able to:	
A1.	Demonstrate basic knowledge specialized in the field of pharmaceutical quality control quality assurance, good manufacturing practices and others.
A2.	Illustrate the different methods of stability studies of pharmaceutical products.
A3.	Recognize ethical research methodologies, regulations, and guidelines required for practicing the research of Quality control of drugs.
A4.	Recognize the essential knowledge in analysis of pharmaceutical dosage forms in the biological samples and bioavailability and bioequivalence studies.
B. Intellectual Skills Upon successful completion of the Master of pharmaceutical quality control Program, graduates should be able to:	
B1.	Design scientific research proposals and studies according to scientific foundations and methodology.
B2.	Evaluate the data and results obtained from the laboratory practical investigations
B3.	Distinguish different procedures of quality assurance and good manufacturing practices and pharmaceutical stability studies..
B4.	Develop different methods for isolation, separation and purification of drugs in the biological samples.
C. Practical and Professional Skills Upon successful completion of the Master of pharmaceutical quality control Program, graduates should be able to:	
C1.	Utilize different methods and apparatus for performing research in quality control and stability of drugs.
C2.	Use different methods for separation and purification of samples as dosage forms or in the biological samples.
C3.	Practice bioavailability and bioequivalence studies.
C4.	Apply different biostatistics calculations related to quality control tests of the pharmaceutical dosage forms.
C5.	Utilize skills for writing reports and thesis and publishing papers.
D. Key Transferrable Skills Upon successful completion of the Master of pharmaceutical quality control Program, graduates should be able to:	
D1.	Communicate effectively and ethically with public, and health care professionals.
D2.	Apply management, decision-making, time management, organization and teamwork skills.
D3.	Take responsibility for adaptation to change needs in pharmacy practice.
D4.	Use internet to communicate and publishing researches.

12. Teaching Strategy to Achieve Program Learning Outcomes		
PILOs	**Teaching Strategy**	**Assessment Methods**
Knowledge and Understanding A1, A2, A3,A4	Lectures. Independent study Self-Learning. Active learning Computer hands-on sessions. Presentations Seminar	Written Exam Oral Discussion Presentations Quizzes Survey Assignments Seminar
Intellectual Skills B1, B2, B3, B4	Interactive Lectures Seminars Discussions & Small group discussions Presentation Problems solving Brain storming Self-learning	• Written Exam Oral Discussion Presentations Quizzes Assignments Seminar Written report
Professional & practical skills C1, C2, C3, C4, C5	Independent study Self-Learning. Analysis and Problem Solving. Laboratory works. Presentation Seminar Project supervision Brain storming Publish research Research activities	Oral Discussion Presentations Laboratory Reports Experimental and field work Survey Assignments Seminar Written report Written research proposal Thesis and publications
General & Transferable Skills D1, D2, D3, D4	Self-Learning. Active learning Presentations Seminar	Oral Discussion Presentations Assignments Seminar Written report

Teaching Strategy	**Description of the Main Strategy Used**
Self -study	Self-study is an individualized learning experience that allows students to select a topic focus, define problems or questions, gather and analyze information, apply skills, and create a product to show what has been learned. A variety of web-based searches students will be assigned to learn how they can search for solutions using the Web.
Computer hands-on sessions.	Practical applications using a variety of software before the real design and implementation.

Problem Solving.	It allows students to become more active in their learning as they work out what information, they need to find out how to solve a particular problem. They can work out a problem collaboratively, practice research as well as testing different components to come up with a valid solution.
Laboratory works.	During laboratory sessions, students will be given experiments to work in groups where they can apply the theories and principles gained. This gives them the opportunity to have hands-on experience to design and conduct experiments in addition to analyzing, interpreting data obtained from experiments, and maximize their learning through actual simulation
Presentations	students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Presentation sessions provide an opportunity to address questions, queries, and problems.
Project supervision	The teacher needs to set advance work for students, and then have the students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Project sessions provide an opportunity to address questions, and problems.
Brain storming	Brainstorming is an effective technique for generating lists of ideas and creating interest and enthusiasm for new concepts or topics. Brainstorming provides teachers and students with an overview of what students know and/or think about a specific topic. Students can use brainstorming to organize their knowledge and ideas.
Seminar	The teacher needs to set advance work for a selected number of students, and then have the selected students present their work to the whole group, for discussion, criticism, and suggestions for improvement. Seminar sessions provide an opportunity to address questions, queries, and problems.
Research activities	Research-led activities envisage activities in which students learn about current research in the discipline and are frequently an audience. The emphasis is put on the research content.

Assessment Strategy	Description of the main strategy used.
Oral Discussion	To know the knowledge of the students.
Presentations	For Final Results displaying, to enhance the level of students in different subjects.
Laboratory Reports	To demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.

Experimental and field work	For evaluation, to demonstrate the personal skills, practical expertise, communication skills, report writing skills, and team work expertise they are expected to be learned and gained through their education.
Seminar	As mentioned in the course specification and used to measure the higher thinking skills of students.
Assignments	The entire assignments including problem-solving exercises of coursework activities and homework during the teaching period of each course. (which includes group and individual work, tests and presentations, etc.)
Written research proposal	According to university guidelines
Thesis and publications	According to university and journal guidelines

13. Intended Learning Outcomes Mapping:

See Annex ....

14. Program Structure:

No	Requirements		No. of Courses	Credit Hours	Rational Weight %
1	University Requirements	Compulsory			
		Elective			
2	Basic Requirements	Compulsory			
		Elective			
3	Faculty Requirements	Compulsory	3	6	15.4
		Elective			
4	Department Requirements	Compulsory			
		Elective			
5	Program Requirements	Compulsory	9	27	69.2
		Elective			
6	Field Training	Compulsory			
		Elective			
7	Project Courses	Compulsory		6	15.4
		Elective			
	Total:			**39**	**100%**

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ا.د. توفيق احمد د. عبدالواسع القدسي د.محمد عباس حميد الدين ا.د.احمد السباتي ا.د. هدى العماد ا.د. القاسم محمد عباس

Elective Courses: None									
1.1. Faculty Requirements									
Compulsory Courses (3 courses/ 6 Hrs)									
No.	**Level-Sem.**	**Course Code**	**Course Name**	**اسم المقرر**	**Cr. Hrs.**	**L**	**T**	**P**	**Prerequisites, Co-requisites**
1	1	PHR1	Pharmaceutical biostatistics		2				
2	1	PHR2	Research methodology		2				
3	1	PHR3	Legislation and Regulatory affairs		2				
			Total		6				

Elective Courses: None									
1.2. Program Major									
Compulsory Courses (9 courses/ 27 Hrs)									
No.	**Level-Sem.**	**Course Code**	**Course Name**	**اسم المقرر**	**Cr. Hrs.**	**L**	**T**	**P**	**Prerequisites, Co-requisites**
1	1	PHQ1	Advanced Pharm. Instrumental analysis I		3	3			
2	1	PHQ2	Pharmaceutical Quality Control I		3	3			
3	2	PHQ3	Advanced Pharm. Instrumental analysis II		3	3			
4	2	PHQ4	Pharmaceutical Quality Control II		3	3			
5	2	PHQ5	Stability of Pharmaceutical Products		3	3			
6		PHQ6	Separation and purification methods		3	3			
7	2	PHQ7	Bioassay of Pharmaceutical Products		3	3			
8	3	PHQ8	Quality Assurance		3	3			
9	3	PHQ9	Good Manufacturing Practices		3	3			
			Total		27	27			
Project Work Courses (courses/ 3 Hrs)									
No	**Level-Sem.**	**Course Code**	**Course Name**	**اسم المقرر**	**Cr. Hrs.**	**L**	**T**	**P**	**Prerequisites, Co-requisites**
1									
			Total						

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Study Plan:

Level 1

Semester 1

No.	Level-Sem.	Course Code	Course Name	اسم المقرر	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
1		PHQ1	Advanced pharm. Instrumental analysis I		3	3			
2		PHR1	Pharmaceutical biostatistics		2	2			
3		PHQ2	Pharmaceutical Quality control I		3	3			
4		PHR2	Legislation and Regulatory affairs		2	2			
5		PHR3	Research methodology		2	2			
6		PHQ9	Good Manufacturing Practices		3	3			
					15	15			

Semester2

No.	Level-Sem.	Course Code	Course Name	اسم المقرر	Cr. Hrs.	L	T	P	Prerequisites, Co-requisites
1		PHQ3	Advanced Pharm. Instrumental analysis II		3	3			
2		PHQ4	Pharmaceutical Quality control II		3	3			
3		PHQ5	Stability of Pharmaceutical Products		3	3			
4		PHQ6	Separation and purification methods		3	3			
5		PHQ7	Bioassay of Pharmaceutical products		3	3			
6		PHQ8	Quality Assurance		3	3			
			Total		18	18			

Distribution of Total Credit Hours:

Level	Term	University Requirements		Faculty Requirements		Program Requirements		Training		Project		Total Cr. Hrs.		Total Cr. Hrs./ Level
		No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	
First	First			3	6	3	9					6	15	
	Second					6	18					6	18	
											6		6	
Total:				3	6	9	27				6		39	
Percentage:														

15. Admission Requirements:

1. Admissions to the program shall be made as per the admission rules set by the Ministry of Higher Education and Scientific Research as well as University of admission guidelines.
2. Bachelor in Pharmacy with at least performance of Good.

Attendance and Graduation Requirements:

1. Passing all the courses exams.
1. Student will graduate after successfully passing all program requirements.
2. Publishing at least one research in one of the international journals.

2. Grading System:

From 90% to 100% of total marks	Excellent
From 80% to less than 90%	Very Good
From 75% to less than 80%	Good
From 65% to less than 75%	Pass
Less than 50%	Poor/Fail

Facilities Required for Running the Program:

1. Sufficient hall furnished with all necessary pieces and equipment.
2. A Lab. as per the courses specifications.
3. Academic and administrative staff offices
4. Library.
5. Researching center.

Thesis

The student must prepare and discuss a Thesis.

Thesis and Its Requirements (if any)

1. Registration of the thesis:

(Requirements/conditions and procedures for registration of the thesis as well as controls, responsibilities and procedures of scientific guidance)

- Completion of all university requirements.
- Field of Research and precise research topic with short Description and suggested time plan.
- First Department Seminar.
- Decision letter (Supervisors) of acceptance of the research topic.
- Any further requirements and controls based on post-graduate deanship regulations.

2. Scientific Supervision:

(The regulations of the selection of the scientific supervisor and his/her responsibilities, as well as the procedures/ mechanisms of the scientific supervision and follow-up)

- At most 2-3 supervisors are selected for the supervision of a thesis.
- At least 1-Associate (or Full) Professor is appointed as supervisor either from the department or from another department outside the faculty.

- Any Assistant Professor appointed as supervisor should have at least 4-year experience in the field of research and have published at least one paper.

Candidates may apply for one-year extension (full-time) for completion of the thesis to the Postgraduate Program Administration at the Faculty of Pharmacy, which will be granted if the candidate provides a valid reason for extension.

The supervisor responsibilities are - :

- Help and assist the candidate/researcher in preparing the research plan.
- Guide the candidate to adhere to certain standards of academic integrity and research ethics, including combating plagiarism.
- Monthly, follow up and meeting with the researcher (at least one meeting per month) ،
- Guide the researcher at every step to be done during thesis work؛
- Write follow-up (progress report) after each meeting
- Write a follow-up (evaluation report) every semesters.
- The supervisor shall submit copies of these reports to the Postgraduate-Program coordinator, the Head of the Department and the Head of the Faculty Post-graduate.
- Write the final thesis acceptance report in order to prepare the final department seminar and then initiating the preparation for thesis presentation, defense and approve.

The candidate/student responsibilities are - :

- Student present his/her accomplishment at the end of every semesters
- plan and actively pursue the research؛
- identify and deal with any research-related problems؛
- comply with administrative requirement؛
- meet ethical guidelines؛
- take responsibility for the final form of the thesis
- A thesis or research portfolio is the outcome of independent research, or creative activity

conducted under supervision.

- The length of a (6) credit hours thesis or research portfolio will be appropriate to the discipline and must not exceed … words, including bibliography, footnotes or endnotes and essential appendices, unless specific permission has been granted by the Department .

3.Thesis Defense/Examination:

(The regulations for selection of the defense/examination committee and the requirements to proceed for thesis defense, the procedures for defense and approval of the thesis, and criteria for evaluation of the thesis)

- A thesis proceeds for defense following completion of:
- At least two research paper is accepted in a journal in the field of research.
- Final acceptance letters provided by the supervisor(s) and the department final seminar committee (at least 3-department members)،
- The examination committee should consist of - :
- One -Associate (or Full) Professor specialized in the field of research from an external university ،
- One -Associate (or Full) Professor from the department of Medicinal chemistry, Pharmacy in addition to the supervisor of the thesis.
- A session for presentation, defense and approval of the thesis should be done based on the following- :
- At least two members of the examination committee accept their assignment and reply by acceptance letter and approve the thesis for defense within one month.
- The session of defense should be declared within two weeks after receiving of examination committee members' approval letters.

16. Teaching staff:				
	Professor	Associate Professor	Assistant Professor	Technicians Assistants
Required Number	1-2	1	1	2
Available Number		1	1	2
Note:				

17. Program Management and Regulations

1. Program Management

1.1 Program Structure

(including boards, councils, units, committees, etc.)

1.2 Stakeholders' Involvement

Describe the representation and involvement of stakeholders in the program planning and development. (students, professional bodies, scientific societies, alumni, employers, etc.)

2. Program Regulations

Provide a list of related program regulations, including their link to online version: admission, study and exams, recruitment, appeals and complaint regulations, etc.)

Decision of the Presidency of the Council of Ministers No. 40 of 2008
Decision of the Presidency of the Council of Ministers No. 141 of 2008
Graduate Studies Guide to Sana'a University

18. Evaluation of Program Quality Matrix:

Evaluation Areas/Aspects	Evaluation Sources/References	Evaluation Methods	Evaluation Time

Note:
Evaluation Areas/Aspects (e.g., leadership, effectiveness of teaching & assessment, learning resources, partnerships, etc.)
Evaluation Sources (students, graduates, alumni, faculty, program leaders, administrative staff, employers, independent reviewers, and others (specify)
Evaluation Methods (e.g., Surveys, interviews, visits, etc.)
Evaluation Time (e.g., beginning of semesters, end of academic year, etc.)

19. List of Annexes

Annex (1)	Academic Standards Curriculum Criteria of Accreditation Board for ……. program.
Annex (2)	Survey of names of Similar Accredited Programs at International Universities (Benchmarks) for …….. Programs.
Annex (3)	Survey of Intended Learning Outcomes for similar Accredited electrical……. Programs at International Universities.
Annex (4)	Summary of similar Programs (Benchmarks) for ……... Program.
Annex (5)	Survey of course names of Similar Programs.
Annex (6)	Survey/Mapping of Vision, Mission and Objectives of similar Accredited Programs at International Universities (Benchmarks) for master programs.
Annex (7)	Mapping of the mission and objectives of the program with the vision, mission and objectives of faculty, and the university.
Annex (8)	Main Themes/Sub-Themes with Relative weight for Program (if need)
Annex (9)	PILOs Distribution to General Themes for Program (if need)
Annex (10)	Matrix of mapping program P- ILO's with courses
Annex (11)	Mapping the benchmarks with PILO's (if need)
Annex (12)	Mapping Program's Goals with Intended Learning Outcomes
Annex -13	The Admission Requirements for the Program.

Appendix

Annex (4); Summary of similar Programs (Benchmarks) for Master of pharmaceutical quality control Program.

	The Similar Programs (Benchmarks)						Current Program
	1st Program	2nd Program	3rd Program	4th Program	5th Program	6th Program	
Program Title	Pharmaceutical Analysis-Quality Control	Medical Product Quality	Pharmaceutical Analysis and Quality Control	Quality Control of Pharmaceutical Products	Pharmaceutical Quality Control	Pharmaceutical analysis and Quality assurance	Pharmaceutical Quality Control
Faculty	Faculty of Pharmacy	USC School of Pharmacy	King's Collage	College of Pharmacy	Faculty of Graduate studies	Faculty of Pharmacy	Faculty of Pharmacy
University	Athens	Southern California	London	King Saud	Jordan University of Science and Technology	Kart	Sana'a
Country	Greece	USA	UK	KSA	Jordan	India	Yemen
Type of Program	Master	Master	Master	Master	Master	Master	Master
Study methods in the program:	Courses + Thesis	Courses +graduation project	Courses +graduation project	Courses + research project	Courses + Thesis	Courses + research work	Courses + Thesis
Number of semesters	4 Semisters	10 Semisters	2 Semisters	4 Semisters	4 Semisters	4 Semisters	4-8 Semisters
Total Credit Hours	120 ECTS (60 Credit Hours)	32 unit	105 credit hours	46 Unit	47 credit hours	-	39 credit hours
No. of Courses	11	7	5	18	16	12	**12**

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Annex- 5 :Survey of course names of Similar Programs.

University		Sana'a	Athens	Southern California	London	King Saud University	at Jordan University of Science and Technology	Kart
Faculty		Faculty of Pharmacy	Pharmacy	USC School of Pharmacy	King's Collage	College of Pharmacy	Faculty of Graduate (studies	Faculty of Pharmacy
Program		Pharmaceutical Quality Control	Pharmaceutical Analysis-Quality Control	Medical Product Quality	Pharmaceutical Analysis and Quality Control	Quality Control of Pharmaceutical Products	Pharmaceutical Quality Control	Pharmaceutical analysis and Quality assurance
Country		Yemen	Greece	USA	UK	K SA	Jordan	India
No. of Courses		12+thesis	11+Thesis	7+graduation project	5+ graduation project	18+research project	16+Thesis	12+ research work
Total Cr. Hrs.		39 credits	120 ECTS	32 unit	105 credits	46 Unit	47	
Total Years			4 Semisters	five years	1 year	2 years	2 years	2yesrs
Term	No							
		Advanced pharm. Instrumental analysis I	Advanced Pharmaceutical Analysis I		Advanced Spectroscopic Instrumental, Chemical and Bio-analytical Techniques	Quality Control of Pharmaceutical Raw Material	Instrumental Analysis	Modern pharmaceutical analytical techniques
		Pharmaceutical biostatistics	Statistics & Chemometrics	RSCI 507: Quality Systems & Statistical Process Control	Numerical Methods and Regulatory Affairs	Pharmaceutical Statistics	Advanced Biostatistics	Research methodology and statistics
		Pharmaceutical Quality control I	Quality control of medicines		Quality Control and Regulatory Matters	Comprehensive Pharmaceutical Quality Control	Pharmaceutical Quality Control: Methods and Tests	Quality Control And Quality Assurance
		Legislation and Regulatory affairs	Legislation and Regulatory affairs		Regulatory Affairs			Audit and regulatory compliance
		Research methodology	Bibliographic search methods		Literature Review Project	Research Project (1) and (2)	Research Methodology	Research methodology and statistics
		Good Manufacturing Practices		MPTX 526: Chemistry Manufacturing and Control		Good Manufacturing Practices (GMP)		
		Advanced Pharm. Instrumental analysis II	Advanced Pharmaceutical Analysis II		Advanced Analytical Techniques		Instrumental Analysis	Advanced Pharm. analysis
		Pharmaceutic		MPTX 515:		Quality Control	Seminar in	Pharmaceutic

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ا.د. توفيق احمد د. عبدالواسع القدسي د.محمد عباس حميد الدين ا.د.احمد السباتي ا.د. هدى العماد ا.د. القاسم محمد عباس

		al Quality control II		Quality Systems & Standards		by Advanced Analytical Methods	Quality Control	al validation
		Stability of Pharmaceutical Products	Stability of Pharmaceutical Products	RSCI 527: Medical Product Safety		Quality Control Testing of Stability & Packaging Stability-Indicating Methods for Pharmaceutical Products	Drug Stability	
		Separation and purification methods			Advanced Separation Science			
		Bioassay of Pharmaceutical products		RSCI 508: Quality Assurance for Drugs and Biologics		Biological Techniques for Quality Control of Biopharmaceuticals		Modern Bioanalytical Techniques
		Quality Assurance		RSCI 509: Quality Assurance for Medical Devices & Combination Products		Quality Control & Assurance in Hospital Pharmacy	Pharmaceutical Quality Assurance and Validation Quality Management and Assurance	Quality Control And Quality Assurance

Annex (7) Mapping of the mission and objectives of the program with the vision, mission and objectives of faculty, and the university.

Relationship between Program Mission and the Mission of the Faculty.

There is a relationship between Program Mission and the Mission of the Faculty as both of them encourage development in discovery of potential drug by research

Mission of the Faculty	Program Mission
Excellence and leadership locally, regionally and globally, in providing knowledge and continuous education in the academic and research field in pharmaceutical sciences According to the markets needs and community services	Preparing qualified students with high professional ethics by providing applied interdisciplinary research in analysis and quality control of the raw materials and pharmaceutical products to meet the needs of the governmental and private health sector, pharmaceutical factories and research centers.

Relationship between Program Goals and the Goals of the Faculty.

no	Goals of the Faculty	no.	Program Goals
7	Demonstrating student's capability of communication skills, time management, critical	5	5.Developing problem-solving skills and critical thinking ability and apply these in developing

	thinking, problem-solving, decision-making and team-working.		the experimental design to obtain the aims of research.
5	Planning, designing and conducting undergraduate and postgraduate research using appropriate methodologies.	2,3, 6	2.Designing plans for pharmaceutical research using appropriate methodologies. 3.Conducting pharmaceutical research using appropriate scientific methodologies, ethics and professional practice 6.Providing the ability to critically review the scientific literature,
6	Developing student's presentation, promotion, pharmaceutical marketing, administration, numeric and computation skills.	**4,7**	4.Demonstrating skills for writing reports and thesis and publishing papers. 7.Developing professionalism and long life learning in pharmaceutical area of interest.
1	Providing students with comprehensive knowledge about physiochemical properties and biological activities of medicinal substances required for formulating and preparing pharmaceutical products from their different sources, natural or synthetic.	**1**	1. Enriching students with advanced knowledge regarding drug quality supervision.

The mission program with mission of the university.

Mission of the University	Mission of the Program
Sana'a University aspires to achieve a national leading role in teaching, learning, scientific research and community service; and to be among the best regional universities and the foremost house of expertise and think tank in Yemen.	Preparing qualified students with high professional ethics by providing applied interdisciplinary research in analysis and quality control of the raw materials and pharmaceutical products to meet the needs of the governmental and private health sector, pharmaceutical factories and research centers.

Relationship between Program Goals and the Goals of the University

Aims of the University	Aims of the Program
1. To provide specialized and in-depth academic opportunities for students in different fields of knowledge to meet the country's needs of specialties, technicians and experts, with special focus on the following:	1,
2. To boost the level and quality of preparation and qualification tasks.	2, 3
3. To create a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.	3, 4, 7
4. To stabilize the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.	3,
5. To develop innovative and critical scientific	2, 6, 5, 7

thinking skills.	
6. To provide students with the required knowledge and scientific and applied skills for solving problems effectively and efficiently.	5

Annex (10) Matrix of mapping program P- ILO's with courses

Courses	Program ILOs																
	A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4	C5	D1	D2	D3	D4
Advanced pharm. Instrumental analysis I	*	*							*								
Pharmaceutical biostatistics	*								*			*	*				*
Pharmaceutical Quality control I	*	*		*					*								
Legislation and Regulatory affairs	*		*						*					*			
Research methodology	*		*		*	*			*				*		*		*
Good Manufacturing Practices	*					*	*		*								
Advanced Pharm. Instrumental analysis II	*	*							*		*						
Pharmaceutical Quality control II	*	*		*				*	*								
Stability of Pharmaceutical Products	*	*					*	*	*	*							
Separation and purification methods	*			*				*	*	*	*						
Bioassay of Pharmaceutical products	*			*				*	*	*	*						
Quality Assurance	*			*			*		*		*	*					

(Annex 12) Mapping Program's Goals with Intended Learning Outcomes

1. Enriching students with advanced knowledge regarding drug quality supervision.	A1, A2, A3, A4
2. Designing plans for pharmaceutical research using appropriate methodologies..	B1, B2, B3, B4
3. Conducting pharmaceutical research using appropriate scientific methodologies, ethics and professional practice	A3, C1, C2, C3, C4
4. Demonstrating skills for writing reports and thesis and publishing papers.	C5, D4
5. Developing problem-solving skills and critical thinking ability and apply these in developing the experimental design to obtain the aims of research.	D2, D3
6. Providing the ability to critically review the scientific literature,	D3
7. Developing professionalism and long life learning in pharmaceutical area of interest.	D1, D3

(Annex -13) The Admission Requirements for the Program.

- a bachelor's degree in Pharmacy from the Faculty of Pharmacy, Sana'a University or from any of the faculties of Pharmacy in Yemeni universities recognized by Ministry of Higher Education.
Good in bachelor's degree
- The student must pass English as a Foreign Language (TOEFL) with a condition of no less than 450 or its equivalent as a requirement for admission to the program.