



Program Specification of Doctor of Philosophy (Ph. D) in Medicinal Chemistry

1. Program Introduction/Description

A Doctor of Philosophy (Ph.D.) in medicinal chemistry prepares a graduate to perform research in the study of drug discovery, development, synthetic methods and biological screening of pharmaceutical substances. The program prepares students for academic or research positions in universities, and industrial or government institutions.

2. Program Identification and General Information

Program Title	Ph.D. in Medicinal Chemistry
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	Research
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	Ph.D. in Medicinal Chemistry
Qualification required to join the program:	- a bachelor's degree in Pharmacy - a Master's degree in Medicinal Chemistry from any Faculties of Pharmacy, any Universities, recognized by Ministry of Higher Education.
Minimum grade requirements to enroll in the program	Very good in master degree
Other admission requirements	- health and under the age of 45 - 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.
Name of the program coordinator	Prof. Dr. Tawfeek A. Yahya
Approval date:	

3. Program Curriculum Committee:



Prof. Dr. Tawfeek A. Yahya
Prof. Dr. Jalal H. Abdullah
Prof. Dr. Shada H. Yassin

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 specialists, technicians and experts, with a special focus on:
 - a) boosting the level and quality of education and qualification tasks.
 - b) Creating a general culture aiming at developing the elements of sound Islamic personality and the proper cognitive and scientific training.
 - c) Stabilizing the true Islamic vision emanating from the broad horizons of Islamic knowledge and its perception of the universe, man and life.
 - d) Developing innovative and critical scientific thinking skills.
 - e) Providing students with the required knowledge as well as scientific and practical skills for solving problems effectively and efficiently.
 - f) Enabling students to carry out, implement and assess scientific research methods.
 - g) Developing positive talents and skills towards working in general with special focus on promoting the spirit of cooperation, collective action, effective leadership, sense of responsibility and ethical commitment.
 - h) Developing positive attitudes towards science and technology, their rapid developments and how to utilize them for developing and solving problems of the Yemeni environment and society.
 - i) Developing the students' positive attitude towards the concept of self-learning and lifelong learning.
2. To cherish Arabic language, its teaching and development; and mainstream its use as the language of science and education in various arenas of knowledge, as a vehicle for cultural meanings, values and ethics of the Arab-Islamic civilization.
3. To develop knowledge through engaging in multidisciplinary research, both individually and



collectively, and directing them towards serving the community needs and development plans.
4. To nurture the development of technology and its utilization in the community development.
5. To promote the activities of authorship, translation and publishing in various fields of knowledge with special emphasis on the Yemeni heritage.
6. To contribute to the promotion of arts, literature and the advancement of sciences.
7. To offer an academic atmosphere conducive to the freedom of thought, expression and publication in a way that does not contradict with the lofty values and elevated ideals of Islam.
8. To strengthen relations with universities and public and private institutions in the country to ensure a mutual and constructive interaction of knowledge, expertise, resources and participation that will guarantee effective contribution to the comprehensive development of the country.
9. To strengthen scientific and cultural ties with Arab and foreign universities, scientific bodies, and research and development centers, with a view to developing Sana'a University and enhancing its prominence.
10. To offer technical and specialized studies and consultations for various public and mixed-sector institutions.
11. To contribute to the development of policies and ways of work in institutions of both public and private sectors, providing models and innovative experiments to solve various problems.
12. To promote the efficiency of employees in public and private institutions and agencies, by contributing to the development of in-service preparation and qualification programs.

5. 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 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, pharmacovigilance and pharmacoconomics 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. Managing the safe and efficient distribution of medications and participate in quality assurance and improvement programs to maintain the sustainability of good practice.
9. Demonstrating 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.

6. 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 pharmaceutical 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, thesis and publishing papers.



7. Mission & Aims of the Program

Mission of the Program

The program seeks to prepare practically qualified pharmaceutical postgraduates with high professional ethics by providing applied interdisciplinary research in designing, discovery, development, synthesis, and biological evaluation of potential pharmaceutical compounds to support healthcare services of the community.

Aims of the Program

1. Mastering the basics theories and methods of the principles of Scientific research in Medicinal Chemistry field.
2. Suggesting possible plans to approach drug design and solve problems of new drug molecules synthesis.
3. Demonstrating modern methods and techniques in the experimental work according to the GLP guidelines.
4. Providing the basic principles of scientific research methodologies, ethics and professional practice
5. Interpreting the results and information obtained from the work and writing reports, thesis and publishing papers.
6. Developing problem-solving skills and critical thinking ability and apply these in developing the experimental design to obtain the aims of research.
7. Disseminating the work in peer reviewed journals and international conferences.
8. Demonstrating capability of communication skills, time management, decision-making and team-working.
9. Reviewing the literature critically for developments of professionalism and long life learning in their area of interest.

8. Program Standards & Benchmarks [Annex (2)]

Program Standards

- Rules and Regulations of the Ministry of Higher Education and Scientific Research, Yemen.

Program Benchmarks

- 1- Doctor of Philosophy (Ph. D) degree in Pharmaceutical Sciences (Pharmaceutical Chemistry)- Faculty of Pharmacy- Cairo university- Egypt.
<https://pharma.cu.edu.eg>.
- 2- PhD Program of Frontiers in Medicinal Chemistry and Life Sciences (MC&LS), Kaohsiung Medical University (KMU)- Taiwan
<https://chem.kmu.edu.tw/index.php/en-GB/phd-program-introduction>
- 3- Doctor of Philosophy (Ph. D) degree in Pharmaceutical Sciences (Medicinal Chemistry)- School of Pharmacy- Mississippi University- USA
<https://catalog.olemiss.edu/2023/fall/undergraduate/pharmacy/biomolecular-sciences/phd-pharmsci/phd-phsci-mc>
- 4- Doctor of Philosophy (Ph. D) degree in Medicinal Chemistry program - Department of Medicinal Chemistry- Ernest Mario School of Pharmacy - Rutgers University- USA
<http://www.mailto:elissa.glinn@pharmacy.rutgers.edu>.
- 5- Doctor of Philosophy (Ph. D) degree in Medicinal Chemistry-Monash University- School of Pharmacy - Malaysia.
<http://www.monash.edu.my/pharmacy>
- 6- Doctor of Philosophy (Ph. D) degree in Pharmaceutical Sciences (Medicinal Chemistry)- College of Pharmacy- Qatar university- Qatar
http://www.phd_pharmacy@qu.edu.qa



9. Program Intended Learning Outcomes (PILOs)

A. Knowledge and Understanding

Upon successful completion of the Ph.D. in Medicinal Chemistry Program, graduates should be able to:

A1.	Demonstrate the basic theories, principles and deep knowledge of Medicinal Chemistry and rationale of drug design approaches.
A2.	Illustrate the recent methods, modern tools and techniques used in the medicinal chemistry research taking into account the good laboratory practice (GLP) guidelines.
A3.	Recognize the legal, ethical principles, research methodologies and guidelines required for practicing the research of Medicinal Chemistry and Drug design.

B. Intellectual Skills

Upon successful completion of the Ph.D. in Medicinal Chemistry Program, graduates should be able to:

B1.	Suggest creativity and innovative scientific and professional approaches for designing a systematic research plan to study a specified problem in Medicinal Chemistry field.
B2.	Analyze and evaluate/interpret information and results obtained from the work
B3.	Utilize the obtained results to publish papers in specialized journals.
B4.	Demonstrate capability in designing alternative experimental procedures to solve encountered work problems.

C. Practical and Professional Skills

Upon successful completion of the Ph.D. in Medicinal Chemistry Program, graduates should be able to:

C1.	Utilize suitable and modern computer programs in designing the novel synthesized compounds
C2.	Handle safely Chemicals, experimental animals and biological fluids used in experimental research.
C3.	Carry out practical experiments of research according to advanced technological research tools and equipment and GLP guidelines.
C4.	Practice writing of professional report in all stages of the work.

D. Key Transferrable Skills

Upon successful completion of the Ph.D. in Medicinal Chemistry Program, graduates should be able to:

D1.	Develop professionalism and life-long learning.
D2.	Participate in scientific seminars and conferences in medicinal chemistry fields.
D3.	Communicate effectively with other colleagues, researchers and health care professionals.
D4.	Demonstrate problem-solving, writing skills, critical thinking and decision-making ability during research work.

10. Teaching Strategy to Achieve Program Learning Outcomes

ILOs	Teaching Strategy	Assessment Methods
A1	Self-Learning.	Self-study,



ILOs	Teaching Strategy	Assessment Methods
	Active Learning Group Discussion Computer Hands-On Sessions. Presentations Seminar	Oral Discussion, Assignments Seminar.
A2	Self-Learning. Active learning Computer hands-on sessions. Presentations Seminar	Self-study, Oral Discussion, Presentations Assignments Seminar.
A3	Self-Learning. Active learning Problem solving Computer hands-on sessions. Presentations Seminar	Research activities Oral Discussion, Seminar, Presentations
B1	Seminars Group discussion Presentation Problems solving Brain storming Self-learning	Written research proposal Written report Seminar Presentations Assignments
B2	Seminars Group discussion Presentation Problems solving Brain storming Self-learning	Experimental and field work, Laboratory Reports Assignments
B3	Seminars Group discussion Presentation Problems solving Brain storming Self-learning	Written reports, Thesis and papers Assignments
B4	Seminars Group discussion Presentation Problems solving Brain storming Self-learning	Research activities Brainstorming Problem solving Assignments
C1	Self-Learning. Analysis and Problem Solving.	Experimental and field work, Seminar



ILOs	Teaching Strategy	Assessment Methods
	Laboratory works. Presentation Seminar Project supervision Brain storming Publish research Research activities	Laboratory Reports Assignments
C2	Analysis and Problem Solving. Laboratory works. Project supervision Brain storming Research activities	Experimental and field work
C3	Self-Learning. Analysis and Problem Solving. Laboratory works. Project supervision Brain storming Research activities	Experimental and field work Laboratory Reports, Assignments
C4	Self-Learning. Presentation Seminar Project supervision Brain storming Publish research Research activities	Written report and Thesis
D1	Self-Learning. Active learning Presentations Seminar	Self-Learning. Assignments
D2	Self-Learning. Active learning Presentations Seminar	Seminar, Presentations
D3	Self-Learning. Active learning Presentations Seminar	Seminar, Presentations, Oral Discussion Assignments
D4.	Self-Learning. Active learning Presentations Seminar	Research activities Brainstorming Problem solving Assignments



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 supervisor needs to set advance work for a selected 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.
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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.
Assignments	The entire assignments including problem-solving exercises, activities and homework during the research work.
Seminar	It is used to measure the higher thinking skills of students.
Written report	According to research points
Written research proposal	According to university guidelines
Thesis and publications	According to university and journal guidelines

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. - Thesis work should be done in at least 3-years.



- Thesis work should be done in at most 4-years.
- 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 from the department of 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 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 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.



11. System of Study	
Type of program	Research
Study methods in the program:	Regular
The period to complete the program	Min. 2 Years (4 Terms) Max. 4 Years (8 Terms)
Total Credit Hours for courses & Research	

12. Admission Requirements:
1. a bachelor's degree in Pharmacy
2. Master Degree in Medicinal Chemistry
3. Interview
4. TOEFL / IBT: 80
5. ICDL (Computer Skills):
6. Arabic Language:
7. Student number capacity of 4 students per year
8. Transfer Requirements, and Courses Equivalency
9. Annex -13: shows the Admission Requirements for the Program.

13. Graduation Requirements:
Student attendance should not be less than ... %.
Student will graduate after successfully passing the ... credit hours courses and ... credit hours Research.
Student must achieve a minimum average score for all courses is ... % degree
Minimum score for any student to pass any credit hours course is % degree.
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 65% Poor/Fail

14. Learning Resources, Facilities, and Equipment for Running the Program
Learning Resources.
- Policies and Procedure for providing and quality assurance of learning resources textbooks, references and other resource materials, including electronic and web-based resources, Journal Database, etc. - Textbooks, reference - University database which allows access to most of the international publishing houses
Facilities and Equipment
Policies and Procedure for providing and quality assurance of Facilities and Equipment (Library, laboratories (Structure, material Labs), medical facilities, classrooms, etc.).



The program requires Infrared spectrophotometry, Mass spectrophotometer, Nuclear Magnetic Resonance (NMR) spectrometer.

List of laboratories: laboratories of Faculty of Pharmacy, Sana'a University

15. Teaching staff:				
	Professor	Associate Professor	Assistant Professor	Technicians Assistants
Required Number	3	1	1	2
Available Number	4	-	5	2
Note:				

16. 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



17. 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.)

18. 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 Medicinal Chemistry PhD 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 Ph.D. in Medicinal Chemistry Program

	The Similar Programs (Benchmarks)						Current Program
	1 st Program	2 nd Program	3 rd Program	4 th Program	5 th Program	6 th Program	
Program Title	PhD in Pharmaceutical Sciences (Pharmaceutical Chemistry)	PhD Program of Frontiers in Medicinal Chemistry and Life Sciences (MC&LS),	PhD in Pharmaceutical Sciences (Medicinal Chemistry)	PhD in Medicinal Chemistry	PhD in Medicinal Chemistry	PhD in Medicinal Chemistry	PhD in Medicinal Chemistry
Faculty	Pharmacy	Pharmacy	Pharmacy	Ernest Mario School of Pharmacy	School of Pharmacy	Pharmacy	Pharmacy
University	Cairo	Kaohsiung Medical University (KMU),	Mississippi	Rutgers	Monash	Qatar	Sana'a
Country	Egypt	Taiwan	USA	USA	Malaysia	Qatar	Yemen
Type of Program	PhD	PhD	PhD	PhD	PhD	PhD	PhD
Study methods in the program:	Research	Research	Research	Research	Research	Research	Research
Number of semesters	Min. 2 years	3 years	6 years	5 years	3-4 years	3-4 years	2-4 years
The period for thesis completion	Min. 2 years	3 years	6 years	5 years	3-4 years	3-4 years	2-4 years
The min. period to complete the program	Full time; 2 years	-	-	-	3 years	3 years	2 years
The max.	-	3 years	-	5 years	4 years	4 years	



Annex .4 Summary of Similar Programs (Benchmarks) for Ph.D. in Medicinal Chemistry Program

period to complete the program							4 years
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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	The program seeks to prepare practically qualified pharmaceutical postgraduates with high professional ethics by providing applied interdisciplinary research in designing, discovery, development, synthesis, and biological evaluation of potential pharmaceutical compounds to support healthcare services of the community.

Relationship between Program Goals and the Goals of the Faculty.

no	Goals of the Faculty	no.	Program Goals
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.Mastering the basics theories and methods of the principles of Scientific research in Medicinal Chemistry field.
5	Planning, designing and conducting undergraduate and postgraduate research using appropriate methodologies.	2,3,4	2.Suggesting possible plans to approach drug design and solve problems of new drug molecules synthesis. 3.Demonstrating modern methods and techniques in the experimental work according to the GLP guidelines. 4.Providing the basic principles of scientific research methodologies, ethics and professional practice
6	Developing student's presentation, promotion, pharmaceutical marketing, administration, numeric and computation skills.	5,7,9	5. Interpreting the results and information obtained from the work and writing reports and thesis and publishing papers. 7. Disseminating the work in peer reviewed



			journals and international conferences. 9.Reviewing the literature critically for developments of professionalism and long life learning in their area of interest.
7	Demonstrating student's capability of communication skills, time management, critical thinking, problem-solving, decision-making and team-working.	6, 8	6.Developing problem-solving skills and critical thinking ability and apply these in developing the experimental design to obtain the aims of research. 8.Demonstrating capability of communication skills, time management, decision-making and team-working.

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.	The program seeks to prepare practically qualified pharmaceutical postgraduates with high professional ethics by providing applied interdisciplinary research in designing, discovery, development, synthesis, and biological evaluation of potential pharmaceutical compounds to support healthcare services of the community.

Relationship between Program Goals and the Goals of the University

Aims of the University	Aims of the Program
1	1) Mastering the basics theories and methods of the principles of Scientific research in Medicinal Chemistry field.
1h , 3, 11	2) Suggesting possible plans to approach drug design and solve problems of new drug molecules synthesis.
1f, 1g, 2, 3.	3) Demonstrating modern methods and techniques in the experimental work according to the GLP guidelines.
1f, 1g, 2, 3.	4) Providing the basic principles of scientific research methodologies, ethics and professional practice.
5, 6	5) Interpreting the results and information obtained from the work and writing reports, thesis and publishing papers.
1d, 1e	6) Developing problem-solving skills and critical thinking ability and apply these in developing the experimental design to obtain the aims of research.



5,6	7) Disseminating the work in peer reviewed journals and international conferences.
11	8) Demonstrating capability of communication skills, time management, decision-making and team-working.
1i	9) Reviewing the literature critically for developments of professionalism and long life learning in their area of interest.

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

Program's Goals	PILOTs
1. Mastering the basics theories and methods of the principles of Scientific research in Medicinal Chemistry field.	A1, A3
2. Suggesting possible plans to approach drug design and solve problems of new drug molecules synthesis.	B1, C1, B4
3. Demonstrating modern methods and techniques in the experimental work according to the GLP guidelines.	A2, C2, C3
4. Providing the basic principles of scientific research methodologies, ethics and professional practice	A3, C3, D1
5. Interpreting the results and information obtained from the work and writing reports and thesis and publishing papers.	B2, B3, D4
6. Developing problem-solving skills and critical thinking ability and apply these in developing the experimental design to obtain the aims of research.	A1, B1, D4
7. Disseminating the work in peer reviewed journals and international conferences.	D2, B3, C4, D4
8. Demonstrating capability of communication skills, time management, decision-making and team-working.	D3, D4
9. Reviewing the literature critically for developments of professionalism and long life learning in their area of interest.	B3, C4, D1

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

- a bachelor's degree in Pharmacy
- a Master's degree in Medicinal Chemistry 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.
Very good in master degree
- health and under the age of 45
- 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.