

**Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department**



Academic Program and Course Description Guide

2026

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name: .. Al-Qadisiyah
Faculty/Institute: Pharmacy
Scientific Department: ..Pharmaceutical chemistry
Academic or Professional Program Name: ..pharmacy
Final Certificate Name: .bachelor Bsc. in pharmacy
Academic System:
Description Preparation Date:
File Completion Date: 6/8/2026

Signature:



Head of Department Name:

Dr. Hussein Abdelamir Mohammad

Date:

Signature:



Scientific Associate Name:

Date:

The file is checked by:

Department of Quality Assurance and University Performance

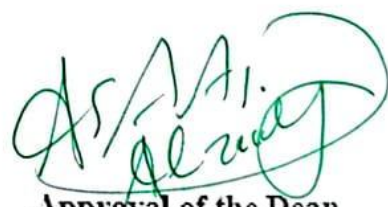
Director of the Quality Assurance and University Performance Department:

Lect. Alyaa Isam Mohammed



Date: 9 / 8 / 2026

Signature:



Approval of the Dean

1. Program Vision

The Pharmacy program is an educational program that aims to graduate pharmaceutical cadres capable of providing the best pharmaceutical and medical services and compatible with scientific progress in the world. In addition to achieving an advanced level in education, scientific research and application in health institutions in order to achieve the best level of patient care and drug development.

2. Program Mission

Providing graduates with balanced, thoughtful knowledge and teaching them to assume ethical responsibility in professions related to health care. Adopting academic and professional programs capable of preparing competent pharmacists. Providing information and technical skills to meet diverse needs in the public and private sectors
For the college to become an educational center based on research and focusing on cooperation between pharmaceutical sciences and the pharmaceutical industry.
Confirm your lifelong commitment to be able to compete in community service
Commitment to applying and following up on the implementation of quality standards

3. Program Objectives

- Providing distinguished education and professional development for College of Pharmacy students.
- Enhancing intellectual curiosity and commitment to lifelong education.
- Encouraging and developing pharmaceutical models appropriate to the various practice environments of this industry.
- Strengthening the connection between the College of Pharmacy and the needs of society.
- Encouraging applied and basic research.
- Encouraging the development of scholars in order to maintain high-quality teaching and learning skills for students.

4. Program Accreditation

Does the program have program accreditation? And from which agency?
NO

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5. Other external influences

Is there a sponsor for the program?
NO

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements				
College Requirements	YES			
Department Requirements	YES			
Summer Training	YES			
Other				

* This can include notes whether the course is basic or optional.

7. Program Description

Year/Level	Course Code	Course Name	Credit Hours	
			theoretical	practical
First year	113	Analytical chemistry	3	2
	1210	Organic chemistry I	3	2
	128	Pharmaceutical principle	2	0
	118	Pharmaceutical and cosmetics preparation	2	2
Second year	211	Organic chemistry II	3	2
	226	Organic chemistry III	2	2
	213	Physical pharmacy I	3	2
	228	Physical pharmacy II	3	2
	2210	Pharmacognosy I	2	2
Third year	313	Pharmaceutical technology	3	2
	328	Pharmaceutical technology II	3	2
	311	Inorganic pharmaceutical chemistry	2	2
	326	Organic pharmaceutical chemistry I	3	2
	315	Pharmacognosy II	2	2
	3210	Pharmacognosy III	2	2
	4140	Biopharmacy	2	2
	421	Industrial pharmacy I	3	2

Fourth year	412	Organic Pharmaceutical chemistry II	3	2
	427	Organic pharmaceutical chemistry III	3	2
Fifth year	511	Organic pharmaceutical chemistry VI	2	
	512	Industrial pharmacy II	3	2
	٥٢١٢	Dosage form design	2	
	5210	Advance pharmaceutical analysis	3	2

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	Demonstrate comprehensive knowledge of pharmaceutical sciences, including pharmaceutics, pharmacology, medicinal chemistry, and clinical pharmacy, and apply this knowledge to patient care and drug development.
Skills	
Learning Outcomes 2	Apply critical thinking and problem-solving skills in clinical and industrial pharmacy settings to ensure safe and effective use of medications.
Learning Outcomes 3	Demonstrate competence in performing pharmaceutical calculations, compounding, dispensing, and use of technology in pharmacy practice.
Ethics	
Learning Outcomes 4	Adhere to ethical, legal, and professional standards in all aspects of pharmacy practice, respecting patient confidentiality and cultural diversity.
Learning Outcomes 5	Exhibit responsibility, accountability, and a commitment to continuous professional development and lifelong learning.

9. Teaching and Learning Strategies

The pharmacy program adopts a diverse and student-centered approach to teaching and learning, integrating both traditional and modern educational methods to ensure the achievement of the program's learning outcomes. These strategies aim to develop students' knowledge, practical skills, critical thinking, and ethical professionalism.

A. Theoretical Instruction

- **Lectures:** Structured lectures are used to deliver foundational and advanced knowledge in pharmaceutical sciences, utilizing visual aids and interactive discussions to enhance comprehension.
- **Interactive Discussions:** Open discussions and Q&A sessions are incorporated to encourage student engagement and clarify complex concepts.

B. Practical and Experiential Learning

- **Laboratory Sessions:** Hands-on training in pharmaceuticals, pharmacology, medicinal chemistry, and pharmaceutical analysis to build technical competence.
- **Simulations:** Use of pharmacy simulation software and patient counseling scenarios to practice clinical and communication skills in a controlled environment.
- **Field Training / Clinical Rotations:** Supervised practice in community pharmacies, hospitals, and pharmaceutical industries to expose students to real-life settings and develop professional behavior.

C. Student-Centered Learning

- **Problem-Based Learning (PBL):** Case studies and real-world problems are used to develop analytical and problem-solving skills.
- **Team-Based Learning (TBL):** Students work in groups to promote collaboration and peer-to-peer learning.
- **Self-Directed Learning:** Students are encouraged to independently seek knowledge through research, online resources, and assignments.

D. Technology-Enhanced Learning

- **Learning Management Systems (LMS):** Use of digital platforms to share materials, submit assignments, and facilitate communication between faculty and students.
- **Multimedia and E-Learning Tools:** Use of videos, animations, and online simulations to supplement traditional teaching methods.

E. Continuous Feedback and Assessment

- **Formative Assessment:** Regular quizzes, oral questions, and feedback sessions to guide student progress.
- **Summative Assessment:** Exams and final evaluations to assess the achievement of learning outcomes.

10. Evaluation methods

Evaluation in the pharmacy program is continuous, comprehensive, and aligned with the intended learning outcomes. A variety of evaluation methods are implemented at all stages of the program to assess knowledge, skills, and professional attitudes.

A. Formative Evaluation (Ongoing Throughout the Program)

Formative assessments are designed to provide continuous feedback to both students and instructors, helping to identify strengths and areas for improvement.

- **Daily Oral Questions and Quizzes**
Used to assess student understanding of topics discussed in lectures and practical sessions.
- **Assignments and Reports**
Evaluate students' ability to research, analyze, and present information clearly and

logically.

- **Laboratory Reports and Skill Checklists**

Used to assess practical performance and adherence to standard procedures during lab sessions.

- **Group Projects and Presentations**

Evaluate collaboration, critical thinking, communication, and understanding of complex topics.

B. Summative Evaluation (End of Modules or Courses)

Summative assessments are used to evaluate the achievement of learning outcomes at the end of a course or academic term.

- **Written Exams (Monthly, Midterm, and Final)**

Test theoretical knowledge through multiple-choice questions, short-answer questions, and essays.

- **Objective Structured Practical Exams (OSPE)**

Assess hands-on skills, decision-making, and application of knowledge in practical settings.

- **Objective Structured Clinical Examinations (OSCE)**

Evaluate clinical and communication skills through simulated patient interactions.

- **Portfolio Assessment**

Tracks student development over time through reflection, documentation of achievements, and self-assessment.

C. Evaluation of Ethics and Professionalism

- **Behavioral Observation**

Instructors and preceptors assess students' professionalism, punctuality, teamwork, and respect for ethical standards.

- **Reflective Journals**

Encourage self-evaluation and ethical reflection during clinical placements or professional experiences.

D. Program-Level Evaluation

- **Comprehensive Exams**

Administered at the end of the program to assess cumulative knowledge and readiness for professional practice.

- **Graduation Research Project / Thesis**

Evaluates research skills, scientific writing, and the ability to conduct independent investigations.

- **Preceptor and Supervisor Evaluations**

Used during training and internship placements to assess performance in real-world settings.

11.Faculty

Faculty Members

Academic Rank	Specialization		Special Requirements/Skills (if applicable)		Number of the teaching staff	
	General	Special			Staff	Lecturer
Professor	chemistry	Analytical chemistry			1	
Assistant professor	Chemistry	Organic chemistry			1	
Assistant professor	Pharmacy	Pharmaceutics			1	
Assistant professor	Pharmacy	Pharmacology			1	
Lecturer	Pharmacy	Pharmaceutics			1	
Lecturer	Chemistry	Organic chemistry			2	
Lecturer	Sport				1	
Assistant lecturer	Chemistry	Organic chemistry			6	
Assistant lecturer	Pharmacy	Pharmaceutics			2	
Assistant lecturer	Pharmacy	Pharmacognosy			2	
Assistant lecturer	Pharmacy	Pharmaceutical chemistry			2	

Professional Development

Mentoring new faculty members

At both the institution and department levels, a structured mentoring process is in place to support new, visiting, full-time, and part-time faculty members. The mentoring system includes:

- **Orientation Program:** New faculty attend an institutional orientation covering policies, procedures, teaching expectations, and academic culture.
- **Assigned Faculty Mentors:** Each new faculty member is paired with an experienced academic mentor within the department to guide them through teaching responsibilities, course planning, assessment methods, and student engagement.
- **Peer Observation and Feedback:** Junior faculty participate in peer-teaching sessions where senior staff observe and provide constructive feedback to improve instructional quality.
- **Regular Check-ins:** Department heads or program coordinators conduct scheduled meetings to review progress, address challenges, and provide support.
- **Integration Activities:** New faculty are encouraged to participate in departmental

meetings, academic committees, and professional activities to foster inclusion and collaboration.

Professional development of faculty members

The college adopts a comprehensive academic and professional development plan to enhance faculty competencies in teaching, assessment, research, and community service. Key components include:

- **Workshops and Training Seminars:** Regular in-house and external workshops are conducted on teaching strategies, curriculum design, student-centered learning, and learning outcome assessment.
- **Continuous Education Opportunities:** Faculty are encouraged to pursue higher qualifications, certifications, and participate in national and international conferences.
- **Research Support:** The institution provides resources and incentives for faculty to conduct research, publish in peer-reviewed journals, and engage in collaborative projects.
- **Performance Appraisal and Feedback:** Annual evaluations include classroom observation, student feedback, and self-assessment, with follow-up development plans based on outcomes.
- **Use of Technology in Teaching:** Faculty are trained in the use of learning management systems, virtual learning tools, and digital assessment platforms to enhance instructional delivery.
- **Encouragement of Innovation:** Faculty are supported to implement innovative teaching practices and pilot new approaches in both theory and practical components.

12. Acceptance Criterion

The College of Pharmacy follows clearly defined and regulated admission criteria in accordance with the guidelines established by the Ministry of Higher Education and Scientific Research. These criteria ensure fairness, transparency, and the selection of qualified candidates capable of succeeding in the program.

A. Central Admission

- **Eligibility:** Admission is primarily based on **central admission** controlled by the Ministry
- **Minimum Grade Requirement:** Applicants must meet the **minimum average score** determined annually by the Ministry to qualify for the pharmacy program.
- **Merit-Based Selection:** Admission is competitive and based on student ranking and preferences submitted through the central admission system.

B. Parallel and Special Admissions

In addition to central admission, the College may accept students through **private/self-financed tracks** (where approved), based on the following:

- **Academic Qualifications:** Applicants must still meet a minimum academic threshold as set by regulatory authorities.
- **Capacity Limits:** Admission under special categories must not exceed the annual enrollment capacity approved by the Ministry and college accreditation body.

- **Compliance with Regulations:** All alternative admission routes must comply with national policies and internal quality assurance mechanisms.

C. Transfer and Foreign Student Admission

- **Transfer Students:** Students from other recognized pharmacy colleges may be accepted on a case-by-case basis, subject to evaluation of academic records and seat availability.
- **Foreign Students:** Admission of international students follows ministry regulations and includes verification of academic credentials and language proficiency (if applicable).

D. Gender Equity and Non-Discrimination

- The admission process adheres to principles of **equity and inclusion**, without discrimination based on gender, ethnicity, or socioeconomic background.

13. The most important sources of information about the program

The pharmacy program provides clear and accessible information to students, faculty, and stakeholders through multiple official sources. These include:

- **College Website:** The primary and most updated source of information, including program structure, learning outcomes, admission requirements, academic calendar, and faculty profiles.
- **Student Guidebook / Program Handbook:** Distributed annually to students, detailing curriculum, course descriptions, academic policies, and assessment methods.
- **Course Specifications and Syllabi:** Provided to students at the beginning of each course, outlining learning outcomes, content, teaching methods, and evaluation criteria.
- **Academic Advising and Orientation Sessions:** Conducted at the beginning of each academic year to familiarize students with program details and support services.
- **Official Announcements and Circulars:** Issued by the college or university administration regarding regulations, schedules, and academic updates.
- **Accreditation and Quality Assurance Reports:** Provide external and internal evaluations of the program's effectiveness and development plans.
- **Social Media Platforms:** Used to share program news, achievements, events, and public engagement activities.

14. Program Development Plan

The Pharmacy Program is committed to continuous improvement and alignment with national and

international standards to ensure the highest quality of education and graduate competence. The Program Development Plan outlines strategic goals and initiatives to enhance curriculum content, teaching quality, assessment, research, and community engagement.

A. Strategic Goals

1. Curriculum Enhancement

- Periodic review and updating of the curriculum to reflect advancements in pharmaceutical sciences and healthcare needs.
- Integration of emerging topics such as personalized medicine, digital health, and biotechnology.
- Alignment with national qualifications framework and accreditation standards.

2. Improvement of Teaching and Learning

- Promote active, student-centered learning methods (e.g., PBL, TBL, simulations).
- Expand the use of e-learning platforms and digital resources.
- Enhance faculty development in innovative teaching strategies.

3. Assessment and Evaluation Improvement

- Strengthen outcome-based assessment tools.
- Introduce Objective Structured Clinical Examinations (OSCE) across relevant years.
- Utilize data from course and program evaluations to guide improvements.

4. Faculty Development

- Implement regular training programs in teaching, research, and clinical supervision.
- Encourage faculty participation in conferences, workshops, and higher studies.
- Support interdisciplinary collaboration and publication in indexed journals.

5. Infrastructure and Learning Resources

- Upgrade laboratory facilities and simulation environments.
- Enhance access to scientific databases and library resources.
- Provide digital tools to support teaching and student learning.

6. Student Support and Engagement

- Strengthen academic advising and mentorship programs.
- Encourage student participation in research and community service.
- Develop leadership and communication skills through extracurricular activities.

7. Research and Community Integration

- Promote research initiatives addressing national health priorities.
- Foster partnerships with healthcare institutions and the pharmaceutical industry.
- Expand community outreach and health awareness campaigns.

B. Implementation and Monitoring

- A **Program Development Committee** oversees the execution and progress of the plan.
- Annual review meetings and performance indicators are used to monitor achievements.
- Stakeholder feedback (students, alumni, employers) is systematically collected to guide planning.
- Action plans are revised based on evaluation outcomes and accreditation recommendations

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
First year	113	Analytical chemistry	Basic	✓	✓			✓				✓			
	1210	Organic chemistry I	Basic	✓				✓	✓			✓			
	128	Pharmaceutical principle	Basic	✓	✓				✓				✓		
	118	Pharmaceutical calculation	Basic	✓	✓			✓				✓	✓		
Second year	211	Organic chemistry II	Basic	✓				✓				✓			
	226	Organic chemistry III	Basic	✓	✓				✓				✓		
	213	Physical pharmacy I	Basic	✓					✓			✓			
	228	Physical pharmacy II	Basic	✓				✓				✓			
	2210	Pharmacognosy I	Basic	✓				✓							
	313	Pharmaceutical technology I	Basic	✓	✓			✓	✓			✓			

Third year	328	Pharmaceutical technology II	Basic		✓			✓				✓			
	311	Inorganic pharmaceutical chemistry	Basic		✓			✓					✓		
	326	Organic pharmaceutical chemistry I	Basic		✓				✓					✓	
	315	Pharmacognosy II	Basic	✓	✓				✓			✓			
	3210	Pharmacognosy III	Basic	✓	✓				✓			✓			
Fourth year	٤١٤٠	Biopharmacy	Basic	✓				✓				✓			
	٤٢١	Industrial pharmacy I	Basic	✓	✓				✓			✓	✓		
	412	Organic Pharmaceutical chemistry II	Basic	✓	✓				✓			✓	✓		
	427	Organic pharmaceutical chemistry III	Basic	✓	✓			✓				✓		✓	
	511	Organic pharmaceutical chemistry VI	Basic	✓	✓			✓				✓			

	512	Industrial pharmacy II	Basic		✓			✓	✓			✓			
	۵۲۱۲	Dosage form design	Basic	✓				✓				✓			
	5210	Advance pharmaceutical analysis	Basic	✓	✓			✓					✓		

❖ Please tick the boxes corresponding to the individual program learning outcomes under evaluation.

Course Description Form

1. Course Name:	
Pharmaceutical industry II	
2. Course Code:	
512	
3. Semester / Year:	
Semester	
4. Description Preparation Date:	
06\08\2026	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours (3 theory, 2 practice)	
7. Course administrator's name (mention all, if more than one name)	
Name: dr. Hussein Abdelamir Mohammad Email: hussein.abdelamir@qu.edu.iq	
8. Course Objectives	
Course Objectives	❖ Understand the structure, functions, and roles of the pharmaceutical industry in drug development and public health. ❖ Gain knowledge about Good Manufacturing Practices (GMP), regulatory guidelines, and quality assurance systems. ❖ Learn the principles of drug formulation, scale-up, and technology transfer from laboratory to industrial production. ❖ Understand the manufacturing processes of various dosage forms (tablets, capsules, injectables, etc.). ❖ Develop awareness of quality control tests and analytical techniques used in pharmaceutical production. ❖ Explore the stages of drug discovery, research and development (R&D), and product lifecycle management. ❖ Learn about pharmaceutical packaging, labeling, and storage requirements. ❖ Understand regulatory affairs, intellectual property rights, and patenting in the pharmaceutical industry. ❖ Develop insights into industrial hygiene, safety standards, and environmental control in pharmaceutical plants. ❖ Prepare students for careers in the pharmaceutical manufacturing sector by enhancing practical knowledge and critical thinking.
9. Teaching and Learning Strategies	
Strategy	❖ Lectures with multimedia presentations To deliver theoretical knowledge using visual aids, animations, and real-life industry examples.

	❖ Case studies and real-world scenarios To analyze industrial problems and regulatory challenges, enhancing problem-solving and critical thinking skills. ❖ Group discussions and collaborative learning To encourage active participation, idea exchange, and teamwork in analyzing industrial practices. ❖ Industrial site visits and field trips (if available) To provide students with firsthand exposure to pharmaceutical manufacturing environments. ❖ Guest lectures by industry professionals To connect students with current industrial practices and professional experiences. ❖ Problem-based learning (PBL) Using industrial challenges or formulation design problems to promote independent learning and application. ❖ Student presentations and seminars To encourage self-learning and effective communication on industry-relevant topics. ❖ Use of simulation software or virtual labs (if resources permit) For modeling manufacturing processes or quality testing in a controlled, virtual environment. ❖ Assignments and research projects To engage students in deeper exploration of pharmaceutical technologies and regulatory systems
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Discuss the tablet manufacturing and advantages	Pharmaceutical dosage forms: Tablets; role in therapy; advantages and disadvantages; formulation; properties;	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

2	3	Discuss evaluation defect in table	evaluation; machines used in tableting; quality control problems; granulation, and	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
3	3	How to produce tablets What excipient	methods of production; excipients, and types of tablets	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
4	3	Coating of tablets, why defect occurs equipment used	Tablet coating; principles; properties; equipments; processing; types of coating (sugar and film)	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

5	2	Problem costing	quality control, and problem	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
6	3	Discuss type capsule equipment	Capsules: Hard gel capsules; production; filling equipments; special techniques.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
7	2		Soft gelatin capsules: Manufacturing methods; nature of capsule shell and content; processing control; stability	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

8	2		Micro-encapsulation; core and coating materials; stability; equipments and methodology.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
9	3		Modified (sustained release) dosage forms; theory and concepts; evaluation and testing; formulation.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
10	2		Liquids: Formulation stability and equipments.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

11	2		Suspensions: The formulation and evaluation	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
12	2		Emulsions: Theory and application; types; formulation; equipments and quality control.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
13	2		Semisolids: Percutaneous absorption; formulation; types of bases (vehicles) preservation processing and evaluation.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and

					Engagement
14	2		Suppositories: Re absorption; uses suppositories; types of bas manufacturing proces problems and evaluation.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
15	2		Pharmaceutical aeros Propellants; contain formulation; types and selection of components;	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
16	2		stability; manufactur quality control and testing.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations

					❖ Participation and Engagement

11. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 80 Marks (80%)

Component	Marks	Description
Daily Oral Questions/Quizzes	5	Short oral or written quizzes to assess understanding
Assignments/Reports	2	Theory-based assignments, critical analysis, literature reviews
Midterm Exam	8	Standard exam to assess knowledge of the first half of the course
Final Exam	60	Cumulative exam covering the full course content
Attendance & Participation	5	Active participation in theoretical lectures

Subtotal (Theory): 80 Marks

B. Practice Component – 20 Marks (20%)

Component	Marks	Description
1. Practical Attendance	3	Presence and punctuality in practical sessions
2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork
3. Practical Reports	4	Quality and accuracy of lab reports or fieldwork documentation
4. Practical Exam	10	End-of-course practical evaluation or OSPE

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The Theory and Practice of Industrial Pharmacy by Leon Lachin et al
Main references (sources)	Pharmaceutics –Dosage Form and Design by David Jones PHARMACEUTICS-Basic Principles and Application to Pharmacy Practice

	Edited by ALEKHA K. DASH, RPH, PHD ,Creighton University, Nebraska, USA, SOMNATH SINGH, PHD ,Creighton University, Nebraska, USA, JUSTIN TOLMAN, PHARMD, PHD, Creighton University, Nebraska, USA
Recommended books and references (scientific journals, reports...)	Essentials of Pharmaceutical Preformulation Simon Gaisford , UCL School of Pharmacy, University College London, London, UK Mark Saunders Kuecept Ltd, Potters Bar, Herts, UK
Electronic References, Websites	1. GOOGLE SCHOLAR 2. Research gate

Course Description Form

1. Course Name:	
Pharmaceutical and cosmetics preparation	
2. Course Code:	
328	
3. Semester / Year:	
Second semester/2025	
4. Description Preparation Date:	
06\08\2026	
5. Available Attendance Forms:	
In person	
6. Number of Credit Hours (Total) / Number of Units (Total)	
(3 hours theory / 2 hours practical per week) 60 hours in total	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant lecturer Marwah Hadi Salim Email: ph.marwah.hadi@qu.edu.iq Name: Assistant lecturer Luma Safaa Eldin Farhan Email: luma.hassnaui@qu.edu.iq	
8. Course Objectives	
Course Objectives	- Explain the theoretical foundations of pharmaceutical dosage form technology, including raw materials, formulations, and preparation methods. - Evaluate the stability, storage conditions, and clinical uses of various pharmaceutical dosage forms. - Identify and characterize potential incompatibilities that may occur in pharmaceutical dosage forms.
9. Teaching and Learning Strategies	
Strategy	Lectures

	Group discussions Case studies Problem-based learning Practical/lab sessions E-learning Brainstorming strategy Quizzes and assessments
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Introduction Definition of emulsion Types of emulsion terminology Classification of emulsions according to physical state -role of emulsifier Disadvantage of emulsion Theory of emulsion	Emulsion	Theoretical lectures, practical experiments, e-learning activities. Video tutorials	Written exams Quizzes Assignments Class participation Attendance
2	3+2	Main properties Types of emulsion Calculation of concentration of S.L. Small Scale Large scale main method of emulsification	Emulsifying agents Method of preparation of emulsion		
3	3+2	stability of emulsions terms associated with emulsions storage of emulsion preservation	Emulsion		
4	3+2	Definition Advantages Route	Suppositories		

		administration Site of drug delivery Supp. Shapes Types and example Suppository Fate Suppository Suppositories	and Inserts.		
5	3+2	Ideal properties Types of bases Suppository Molds Determination of the amount of base* Vaginal Insert Packaging and Storage	Suppository Bases Methods of preparation		
6	3+2	introduction Ideal properties ointment base types of ointment bases(USP) comparison between the ointment base Selection of ideal ointment base	Semisolids		
7	3+2	Preparation ointment COMPENDIAL REQUIREMENTS FOR OINTMENTS ophthalmic ointment (sterile ointment) Creams (vanishing creams) Definition pastes definition g definition	Semisolids		
8		midterm exam Introduction Definition			

9	3+2	Route administration Granules Uses of powders Characterization powders Flowability	Powders Granules	a		
10	3+2	Particle size reduction Comminution of drug Blending of powders Powder papers Medicated powders Route administration Problems associated with particle size reduction Dispensing of powders Granules	Powders Granules.	a		
11	3+2	Definition Advantages of capsules Types of capsules (Shell) Hard gelatin capsules manufacture of hard gelatin shell Preparation of fill hard gelatin capsules Soft gelatin capsules Enteric coated capsules Counting of capsules Storage of capsules Examples of some official capsules.	Capsules			

12	3+2	Pharmaceutical aerosols definition main advantage components aerosols and example Pharmaceutical foam	Capsules		
13	3+2	definition advantages type foams and example introduction types incompatibility Physical Incompatibility chemical incompatibility	Aerosols a Foams		
14	3+2		Pharmaceutic incompatibilit		
		Final assessment a students feedback			
15	3+2				

11. Course Evaluation					
Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports etc					
80% theory					
Component	Marks	Description			
Daily Oral Questions/Quizzes	5	Short oral or written quizzes to assess understanding			
Assignments/Reports	2	Theory-based assignments, critical analysis, literature reviews			
Midterm Exam	8	Standard exam to assess knowledge of the first half of the course			
Final Exam	60	Cumulative exam covering the full course content			
Attendance & Participation	5	Active participation in theoretical lectures			
20% practical					
Component	Marks	Description			
1. Practical Attendance	3	Presence and punctuality in practical sessions			
2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork			
3. Practical Reports	4	Quality and accuracy of lab reports or fieldwork documentation			
4. Practical Exam	10	End-of-course practical evaluation or OSPE			
12. Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)			Ansel's pharmaceutical dosage forms and drug delivery system, 11th Edition.		
Recommended books and references (scientific journals, reports...)			Encyclopedia of pharmaceutical technology, third edition		
Electronic References, Websites			GOOGLE SCHOLAR Research gate		

Course Description Form

13.	Course Name:	
		Pharmaceutical biotechnology
14.	Course Code:	
15.	Semester / Year:	
		Second semester/ 2025
16.	Description Preparation Date:	
		06\08\2026
17.	Available Attendance Forms:	
		Theoretical
18.	Number of Credit Hours (Total) / Number of Units (Total)	
		1 hours (1 theory)
19.	Course administrator's name (mention all, if more than one name)	
	Name: Luma Safaa Eldin Farhan Email: luma.hassnaui@qu.edu.iq Name: Assistant lecturer Marwah Hadi Salim Email: ph.marwah.hadi@qu.edu.iq	
20.	Course Objectives	
Course Objectives	. In the pharmaceutical biotechnology course, one credit hour is dedicated to interactive sessions where basic concepts of pharmaceutical technologies and their use in the development of - therapeutic methods for various diseases throughout the course will be discussed. Acquire a comprehensive understanding of the fundamentals of biotechnology, with a particular focus on pharmaceutical applications. - Explore recent advancements in the development of biotherapies, especially in the field of biotechnology. - Understand the manufacturing process of biopharmaceutical products. - Learn how biotechnological products are transformed into ready-to-use medications. - Develop skills in handling, dispensing, and managing biopharmaceutical products. - Understand the mechanisms of action of biotechnological products and their elimination from the human body. . Prior knowledge of microbiology and industrial pharmacy fundamentals is essential.	
21.	Teaching and Learning Strategies	
Strat	Teaching and Learning Strategies: ❖ Lectures with multimedia presentations	

y	To deliver theoretical knowledge using visual aids, animations • Brainstorming Strategy • Discussion Strategy • Group discussions and collaborative learning • Case Study Strategy • Analyzing real-world examples to enhance understanding of their development, manufacturing processes, and therapeutic applications. • Self-Learning Strategy Learning Strategies • Memorization Strategy • Inference Strategy • Spaced Practice Strategy • Example-Based Strategy • Quizzes and assessments
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22. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Introduction Understand fundamentals biotechnology & pharmaceutical applications -Pharmaceutical Biotechnology Products -Recombinant DNA Technologies -Hybridoma Technology	Introduction Biotechnology	Interactive lectures, Case studies Show learning videos	Quiz, Class participation
2	1	Study microbiological considerations in biotech formulations	Microbiological Aspects of Biotech Formulations	Interactive lectures, Case studies	Quiz, Class participation

3	1	Explore excipients used in IV formulations of biotech products	Excipients Injectable Formulations	Interactive lectures, Case studies	Quiz, Class participation
4	1	Verify protein stability/shelf-life,	Shelf life of protein-based pharmaceuticals	Interactive lectures, Case studies	Quiz, Class participation
5	1	Freeze-drying may provide the desired stability	Protein Stability Lyophilization	Interactive lectures, Case studies	Quiz, Class participation
6	1	Analyze delivery routes & absorption enhancement methods for biotech products	Delivery Routes Absorption Enhancement	Interactive lectures, Case studies	Quiz, Class participation
7	1	Study methods to improve bioavailability & protein delivery	Bioavailability Enhancement Protein Delivery	Interactive lectures, Case studies	Quiz, Class participation
8	1	Examine vaccine formulation adjuvant roles in efficacy enhancement	Vaccine Formulation & Adjuvants	Interactive lectures, Case studies	Quiz, Class participation
9	1	Understand PK/PD of peptide/protein drugs	Pharmacokinetics Pharmacodynamics of Peptide Drugs	Interactive lectures, Case studies	Quiz, Class participation
10	1	proteins are parenterally administered as an aqueous solution. Only recombinant vaccines and a number of insulin formulations are delivered as (colloidal) dispersions.	APPROACHES FOR RATE-CONTROLLED DELIVERY	Interactive lectures, Case studies	Quiz, Class participation

23. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

Component	Marks	Description
Daily Preparation & Quizzes	5	Short oral or written quizzes to assess daily understanding and preparation.
Attendance & Participation	5	Encourages regular attendance and active engagement in lectures.
Midterm Exam	20	An intermediate written exam covering the first part of the course.
Final Exam	70	A comprehensive exam covering the full course content.

24. Learning and Teaching Resources

Required textbooks (curricular books, any)	Pharmaceutical Biotechnology, J. A. Crommelin, Robert D. Syinder
Main references (sources)	
Recommended books and references (scientific journals, reports...)	Journal of Pharmaceutical Biotechnology Covers recent innovations and research in biotech drug delivery, manufacturing, and regulatory updates.
Electronic References, Websites	3. GOOGLE SCHOLAR 4. Research gate

Course Description Form

25. Course Name:					
Organic chemistry II					
26. Course Code:					
٢١١					
27. Semester / Year:					
2025/ first semester					
28. Description Preparation Date:					
06\08\2026					
29. Available Attendance Forms:					
30. Number of Credit Hours (Total) / Number of Units (Total)					
5 hours (3 theory, 2 practical)					
31. Course administrator's name (mention all, if more than one name)					
Name: Dr. Lina Saadi Ismael Email: lina.saadi@qu.edu.iq					
32. Course Objectives					
Course Objectives		- To enable students to understand the chemistry of carbon, and the classification, properties, and reactions of organic compounds. - Understanding the basic structure and properties of organic halides. carboxylic acids, aldehydes, ketones, and amines, in addition to the principles and applications of stereochemistry on these compounds. - Identify the reactions of each class of organic compounds, including the reactions characteristic of the functional group in these compounds.			
33. Teaching and Learning Strategies					
Strategy		❖ Lectures with multimedia presentations To deliver theoretical knowledge using visual aids and animations. ❖ Student presentations and seminars To encourage self-learning and effective communication on relevant topics. ❖ Use simulation software or virtual labs (if resources permit). Performing detection tests for organic compounds in a controlled virtual environment. ❖ Group discussions and collaborative learning. To promote cooperation, active engagement, and the sharing of ideas regarding the use of organic reactions in drug synthesis and synthetic process optimization.			
34. Course Structure					
Week	Hours	Required Learning	Unit or subject name	Learning method	Evaluation method

k		Outcomes			
1-2	6	Describe the structure, properties, and reactions of alkyl halides.	Alkyl halides	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
3-4	5	apply stereochemical principles analyze predict three-dimensional structures reactivity molecules.	Stereochemistry II	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
5-8	12	classify aldehydes and ketones, describe their reactions and properties, and explain the mechanisms of aldol and Claisen condensations.	Aldehydes and ketones (include also aldol and Claisen condensation); Classification reactions and properties	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
9-10	5	Describe the properties of carboxylic acids and explain their key chemical reactions and mechanisms	Carboxylic acids: properties and reactions	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports

				❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
11-1	6	Identify and describe the structure, properties, and reactivity of functional derivatives of carboxylic acids.	Functional derivatives carboxylic acids.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
13-1	6	Classify amines, describe their structure, properties, and basicity, and explain their reactions in various chemical contexts.	Amines I and II.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
15	5	Describe the structure, properties, and reactions of phenols.	Phenols	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

35. Course Evaluation					
Course Evaluation Breakdown (Total: 100 Marks)					
A. Theory Component – 80 Marks (80%)					
	Component	Marks	Description		
	Daily Oral Questions/Quizzes	4	Short oral or written quizzes to assess understanding		
	Assignments/Reports	2	Theory-based assignments, critical analysis, literature reviews		
	Midterm Exam	12	Standard exam to assess knowledge of the first half of the course		
	Final Exam	60	Cumulative exam covering the full course content		
	Attendance & Participation	2	Active participation in theoretical lectures		
Subtotal (Theory): 80 Marks					
B. Practice Component – 20 Marks (20%)					
	Component	Marks	Description		
	1. Practical Attendance	2	Presence and punctuality in practical sessions		
	2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork		
	3. Practical Reports	5	Quality and accuracy of lab reports or fieldwork documentation		
	4. Practical Exam	10	End-of-course practical evaluation or OSPE		
36. Learning and Teaching Resources					
Required textbooks (curricular books, if any)					
Main references (sources)			- Organic Chemistry by Robert T. Morrison and Robert Boyd. (Latest edition) - Organic Chemistry by McMurry; Thomson learning; USA; Latest edition.		
Recommended books and references (scientific journals, reports...)			Organic chemistry by Clayden, Greeves, Warren & Wothers, (Latest edition).		
Electronic References, Websites			5. GOOGLE SCHOLAR 6. Research gate 7. Academia		

Course Description Form

37. Course Name:	
Organic chemistry II	
38. Course Code:	
٢٢٦	
39. Semester / Year:	
2024-2025/ second semester	
40. Description Preparation Date:	
06\08\2026	
41. Available Attendance Forms:	
42. Number of Credit Hours (Total) / Number of Units (Total)	
4 hours (2 theory, 2 practical)	
43. Course administrator's name (mention all, if more than one name)	
Name: Dr. Lina Saadi Ismael Email: lina.saadi@qu.edu.iq	
44. Course Objectives	
Course Objectives	- To teach students the principles of heterocyclic chemistry including the fundamental principles and the features. - Knowledge classes and reactions of heterocyclic compounds; it enable students to apply these principles in complicated reactions that involve heteroatoms. - Recognizing the importance of heterocyclic ring compounds for living organisms and in industry, especially pharmaceutical ones. - Identifying the methods of preparing some of the most important heterocyclic ring compounds.
45. Teaching and Learning Strategies	
Strategy	❖ Lectures with multimedia presentations To deliver theoretical knowledge using visual aids and animations. ❖ Student presentations and seminars To encourage self-learning and effective communication on relevant topics. ❖ Use simulation software or virtual labs (if resources permit). Performing detection tests for organic compounds in a controlled virtual environment. ❖ Group discussions and collaborative learning. To promote cooperation, active engagement, and the sharing of ideas regarding the use of organic reactions in drug synthesis and synthetic process optimization.
46. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	Identify classes of heterocyclic systems, describe their general structures and properties, and explain their natural and medicinal significance.	Heterocyclic system: Classes of heterocyclic systems; general structures; properties; Occurrence in nature and in medicinal products.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
3	2	Describe structures, properties, reactivity of five-membered heterocyclic compounds such as pyrrole, furan, thiophene.	Five-membered heterocyclic compounds: pyrrole; furan and thiophene	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
4	2	Identify and explain natural and synthetic sources of pyrrole, furan, and thiophene	Source of pyrrole, furan and thiophene	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
5-9	10	Explain the reactivity and orientation of	Electrophilic substitution in pyrrole, furan and thiophene: Reactivity and orientation.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and

		electrophilic substitution reactions in pyrrole, furan, and thiophene.		peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
10	2	describe structure, bonding, aromaticity six-membered ring heterocyclic compounds, with a focus pyridine.	Six-membered heterocyclic compound Structure of pyridine.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
11	2	Explain basicity pyridine relation to structure compare it with other nitrogen containing compounds.	Basicity of pyridine.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
12-1	4	Describe the chemical reactions pyridine explain factors influencing reactivity.	Reactions of pyridine	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and

					Engagement
14-1	4	identify describe structures properties saturated membered heterocyclic compounds.	Saturated five-membered heterocyclic compounds.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments ❖	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

47. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 80 Marks (80%)

Component	Marks	Description
Daily Oral Questions/Quizzes	4	Short oral or written quizzes to assess understanding
Assignments/Reports	2	Theory-based assignments, critical analysis, literature reviews
Midterm Exam	12	Standard exam to assess knowledge of the first half of the course
Final Exam	60	Cumulative exam covering the full course content
Attendance & Participation	2	Active participation in theoretical lectures

Subtotal (Theory): 80 Marks

B. Practice Component – 20 Marks (20%)

Component	Marks	Description
1. Practical Attendance	2	Presence and punctuality in practical sessions
2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork
3. Practical Reports	5	Quality and accuracy of lab reports or fieldwork documentation
4. Practical Exam	10	End-of-course practical evaluation or OSPE

48. Learning and Teaching Resources

Required textbooks (curricular books, if any)	The Theory and Practice of Industrial Pharmacy by Leon Lachet et al
Main references (sources)	- Organic Chemistry by Robert T. Morrison and Robert N. Boyd. (Latest edition) - Organic Chemistry by McMurry; Thomson Learning; USA; Latest edition.
Recommended books and references (scientific journals, reports...)	-Heterocyclic Chemistry by J. A. Joule and K. Mills Edition.
Electronic References, Websites	8. GOOGLE SCHOLAR 9. Research gate 10. Academia

Course Description Form

49. Course Name:	
Pharmaceutical chemistry	
50. Course Code:	
412	
51. Semester / Year:	
semester	
52. Description Preparation Date:	
06\08\2026	
53. Available Attendance Forms:	
54. Number of Credit Hours (Total) / Number of Units (Total)	
5 (3 theory, 2 practical)	
55. Course administrator's name (mention all, if more than one name)	
Name: Nawal Talib Ajjah Email: noal.talib@qu.edu.iq	
56. Course Objectives	
Course Objectives	*understanding the mechanism of action of some endogenous compounds and natural products. *enable the students to understanding the concept of Structures activity relationship *Application of this concept in design new drugs. *Translating the drug structural formula into therapeutic Effect *understanding the method of preparation of some pharmaceutical agents *track the synthetic pathway of some endogenous compounds and enzymes in this pathway.
57. Teaching and Learning Strategies	
Strategy	❖ Lectures with multimedia presentations To deliver theoretical knowledge using visual aids, animations, and real-life structural examples. ❖ Case studies and real-world scenarios To analyze chemical structures and regulatory challenges, enhancing problem-solving and critical thinking skills. ❖ Group discussions and collaborative learning To encourage active participation, idea exchange, and teamwork in analyzing pharmaceutical products. ❖ Problem-based learning (PBL) Using chemical structures or formulation design problems to promote independent learning and application.

		❖ Student presentations and seminars To encourage self-learning and effective communication on drug design topics.			
58. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Cholinergic agents	Cholinergicneuron, cholinergicagents, receptorsandtheir subtypes	❖ Lectureswith multimedia ❖ Self-directed learning ❖ Group work peer learning ❖ Hands-on/practic activities ❖ E-learning tools ❖ Projects assignments	*Midterm and Exams *Quizzes and Tests *Assignments Reports *Practical/Hands-on Assessments *Student Presentatio Participation Engagement
2-3	5	Cholinergic agonist	Stereochemistry, S P Products, choline Esterase inhibitors	1. Lectureswith multimedia 2. Self-directed learning 3. Group work peer learning 4. Hands-on/practic activities 5. E-learning tools 6. Projects assignments	*Midterm and Exams *Quizzes and Tests *Assignments Reports *Practical/Hands-on Assessments *Student Presentatio Participation Engagement
4-5	7	Cholinergic blocking agents	SAR, solanaceous Alkaloids analogue SyntheticCholinergi blocking Agents, ganglionic Blocking agents, Neuromuscular blocking agents, And their products	1. Lectureswith multimedia 2. Self-directed learning 3. Group work peer learning 4. Hands-on/practic activities 5. E-learning tools Projects and assignme	*Midterm and Exams *Quizzes and Tests *Assignments Reports *Practical/Hands-on Assessments *Student Presentatio Participation Engagement
6	3	Analgesic agents	SAR of morphine SAR of mepridine ty Molecules, antagoni	1. Lectureswith multimedia 2. Self-directed learning 3. Group work peer learning 4. Hands-on/practic activities 5. E-learning tools Projects and assignme	*Midterm and Exams *Quizzes and Tests *Assignments Reports *Practical/Hands-on Assessments *Student Presentatio Participation Engagement
7-8	7	Analgesic receptors	Endogenous opioid Products Antitussive agents Anti-inflammatory analgesic	1. Lectureswith multimedia 2. Self-directed learning 3. Group work peer learning	*Midterm and Exams *Quizzes and Tests *Assignments Reports *Practical/Hands-on

				4. Hands-on/practical activities 5. E-learning tools Projects and assignments	Assessments *Student Presentation Participation Engagement
9-10-11 12	11	Adrenergic agents	Adrenergic receptors Drug effect adrenergic neuron SAR of agonist Antagonist products	1. Lectures with multimedia 2. Self-directed learning 3. Group work peer learning 4. Hands-on/practical activities 5. E-learning tools Projects and assignments	*Midterm and Final Exams *Quizzes and Self-assessments *Assignments Reports *Practical/Hands-on Assessments *Student Presentation Participation Engagement
13-14 15	9	CNS depressant	Benzodiazepines Barbiturates CNS depressant with Muscle relaxant Properties Antipsychotic Anticonvulsants (their related Compounds)	1. Lectures with multimedia 2. Self-directed learning 3. Group work peer learning 4. Hands-on/practical activities 5. E-learning tools Projects and assignments	*Midterm and Final Exams *Quizzes and Self-assessments *Assignments Reports *Practical/Hands-on Assessments *Student Presentation Participation Engagement

59. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 80 Marks (80%)

Component	Marks	Description
Daily Questions/Quizzes	Oral 3	Short oral or written quizzes to assess understanding
Midterm Exam	15	Standard exam to assess knowledge of the first half of the course
Final Exam	60	Cumulative exam covering the full course content
Attendance & Participation	2	Active participation in theoretical lectures

Subtotal (Theory): 80 Marks

B. Practice Component – 20 Marks (20%)

Component	Marks	Description
1. Practical Attendance	3	Presence and punctuality in practical sessions
2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork
3. Practical Reports	4	Quality and accuracy of lab reports or fieldwork documentation
4. Practical Exam	10	End-of-course practical evaluation or OSPE

60. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Wilson and Gisvold's Textbook of ORGANIC MEDICINAL AND PHARMACEUTICAL CHEMISTRY.
Recommended books and references (scientific journals, reports...)	

Electronic References, Websites	1. GOOGLE SCHOLAR 2. Research gate
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1. GOOGLE SCHOLAR
2. Research gate

Course Description Form

61. Course Name:					
Pharmaceutical chemistry III					
62. Course Code:					
427					
63. Semester / Year:					
Semester					
64. Description Preparation Date:					
06\08\2026					
65. Available Attendance Forms:					
66. Number of Credit Hours (Total) / Number of Units (Total)					
5 hours (3 theory, 2 practice)					
67. Course administrator's name (mention all, if more than one name)					
Name: Nawal Talib Ajjah Email: noal.talib@qu.edu.iq					
68. Course Objectives					
Course Objectives		❖ Understand the mechanism of drug action at molecular level. ❖ Understand the concept of structural-activity relationship and application in drug design of new chemotherapeutic agents. ❖ Understand the role of pharmaceutical chemistry in development of new synthetic therapeutic agents.			
69. Teaching and Learning Strategies					
Strategy		❖ Lectures with multimedia presentations To deliver theoretical knowledge using visual aids, animations, and real-life examples. ❖ Case studies and real-world scenarios To analyze structural features of some drugs, enhancing problem-solving and critical thinking skills. ❖ Group discussions and collaborative learning To encourage active participation, idea exchange, and teamwork in analyzing practices. ❖ Problem-based learning (PBL) Using formulation design problems to promote independent learning and application. ❖ Student presentations and seminars To encourage self-learning and effective communication on chemistry-relevant topics. ❖ Use of simulation software or virtual labs (if resources permit) For modeling manufacturing processes or quality testing in a controlled, virtual environment.			
70. Course Structure					
W	Ho	Required	Unit or subject	Learning method	Evaluation method

ee k	urs	Learning Outcomes	name		
1- 2-3	9	β -lactam antibiotics	Penicillin, mechanism of Action, products, Cephalosporins, products lactamase inhibitors	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
4-5 6	9		Aminoglycosides Macrolides Tetracycline Lincomycins Polypeptides Antiviral agents	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
7	3	sulfonamides	Chemistry of sulfonamides Nomenclature Mechanism of action Resistance SAR Products Sulfones	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
8-9 10	9	Anti-neoplastic agents	Alkylating agents Types Products Miscellaneous compounds	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and

				❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
11-13	9	Anti-neoplastic agents	Antimetabolite antibiotics. Plant products Miscellaneous compounds	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
14-1	6	Hormones	Hormones as Antineoplastic agents, Gene therapy of cancer Monoclonal antibodies	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

71. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 80 Marks (80%)

Component	Marks	Description
Daily Oral Questions/Quizzes	5	Short oral or written quizzes to assess understanding
Midterm Exam	10	Standard exam to assess knowledge of the first half of the course
Final Exam	60	Cumulative exam covering the full course content

Attendance & Participation 5

Active participation in theoretical lectures

Subtotal (Theory): 80 Marks

B. Practice Component – 20 Marks (20%)

Component	Marks	Description
1. Practical Attendance	3	Presence and punctuality in practical sessions
2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork
3. Practical Reports	4	Quality and accuracy of lab reports or fieldwork documentation
4. Practical Exam	10	End-of-course practical evaluation or OSPE

72. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Wilson and Gisvold's Textbook of ORGANIC MEDICINAL AND PHARMACEUTICAL CHEMISTRY.
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	3. GOOGLE SCHOLAR 4. Research gate

Course Description Form

1. Course Name:	
Pharmaceutical technology I	
2. Course Code:	
٣١٣	
3. Semester / Year:	
1 st -Semester 2024-2025	
4. Description Preparation Date:	
06\08\2026	
5. Available Attendance Forms:	
Theoretical, practical	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours (3 theoretical, 2 practical)	
7. Course administrator's name (mention all, if more than one name)	
Name: dr. Hussein Abdelamir Mohammad Email: hussein.abdelamir@qu.edu.iq Name: Assistant lecturer Luma Safaa Eldin Farhan Email: luma.hassnau@qu.edu.iq	
8. Course Objectives	
Course Objectives	General Course Learning Objectives: By the end of this course, students will be able to: 1. Understand the theoretical foundations of pharmaceutical dosage form design and preparation. 2. Understand the principles of preparing pharmaceutical solutions and suspensions. 3. Identify types of liquid dosage forms and their properties. 4. Learn and apply the necessary skills to prepare different types of pharmaceutical solutions (e.g., simple solutions for oral and topical use, syrups, elixirs, spirits, aromatic waters). 5. Choose suitable dosage forms based on drug characteristics. 6. Explain the role of raw materials and excipients in formulation development. 7. Describe and compare preparation methods for different dosage forms. 8. Analyze factors affecting solubility, stability, and storage of dosage forms. 9. Evaluate the pharmaceutical uses of different formulations based on their properties
9. Teaching and Learning Strategies	
Strategy	❖ Lectures with multimedia presentations Lectures will be supported by visual tools such as PowerPoint, animations, and short videos to help students better understand the

	theory behind dosage form preparation and real-world pharmaceutical applications. ❖ Case studies and real-world scenarios To analyze industrial problems and regulatory challenges, enhancing problem-solving and critical thinking skills. ❖ Group discussions and collaborative learning To encourage active participation, idea exchange, and teamwork in analyzing industrial practices. ❖ Optional Field Visits to Local Pharmaceutical Sites ❖ If available, short visits to pharmaceutical manufacturing sites or labs will be organized to give students real-life insights into industrial production and quality control processes. Guest lectures by industry professionals To connect students with current industrial practices and professional experiences. ❖ Problem-based learning (PBL) Students will be presented with practical problems such as choosing ingredients for a stable syrup or solving an issue with solubility. They will work individually or in groups to find solutions. ❖ Assignments and Mini Research Projects Students will complete individual or group assignments related to formulation design, preparation techniques, or storage requirements, encouraging them to explore topics in more depth.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-2	4	□ Classify dispersed system (molecular, colloidal, coarse) □ Compare different dispersed systems in terms of particle size, stability, and pharmaceutical applications. □ Define pharmaceutical solutions and differentiate between types (true, colloidal, coarse). □ Understand	- Solutions and types of solutions Dispersed systems	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

		solvent-solute interactions relevant to dosage form design.			
3	4	Explain solubility and the factors influencing it. Differentiate between solubility and dissolution rate. Apply methods for preparing solutions of non-volatile materials.	Solubility	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
4	4	Classify official pharmaceutical solutions. Understand standard methods of preparation and their intended uses.	Official solutions	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
5	4	Describe aromatic waters and their pharmaceutical importance. Understand preparation techniques, stability considerations and aromatic solutions.	Aqueous Aromatic Solutions	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

6	4	Differentiate between types of syrups (sugar-based, artificial, sorbitol-based). Understand methods to enhance stability prolong shelf life.	Syrups	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
7	3	Explain the role of mixed solvents in drug solubilization. Describe preparation and uses of spirits and elixirs.	Spirits. And elixirs.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
8	3	Differentiate between maceration and percolation. Understand application of these methods in pharmaceutical extraction.	Extraction Methods	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
9	4	Describe the preparation of tinctures, fluid extracts, and oleoresins.	Tinctures Extracts	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and

		Recognize significance extraction concentration techniques.		peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
10	3		Modified (sustained release) dosage forms; theory and concepts ;evaluation and testing; formulation.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
11	6	Differentiate between lyophilic and lyophobic colloids. Discuss stability applications colloidal dispersions.	Colloidal dispersions.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
12	6	Explain the physical characteristics of suspensions. Identify formulation challenges and stabilization techniques for suspensions.	Coarse Dispersions Suspensions	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

13	3	Define clarification and its role in solution preparation. Identify commonly used filter aids and their mechanisms	Clarification Methods	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

11. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 80 Marks (80%)

Component	Marks	Description
Daily Oral Questions/Quizzes	5	Short oral or written quizzes to assess understanding
Assignments/Reports	2	Theory-based assignments, critical analysis, literature reviews
Midterm Exam	8	Standard exam to assess knowledge of the first half of the course
Final Exam	60	Cumulative exam covering the full course content
Attendance & Participation	5	Active participation in theoretical lectures

Subtotal (Theory): 80 Marks

B. Practice Component – 20 Marks (20%)

Component	Marks	Description
1. Practical Attendance	3	Presence and punctuality in practical sessions
2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork
3. Practical Reports	4	Quality and accuracy of lab reports or fieldwork documentation
4. Practical Exam	10	End-of-course practical evaluation or OSPE

12. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems (11th Edition)
Main references (sources)	Sprowl's American Pharmacy; Latest edition
Recommended books and references (scientific journals, reports...)	"Physicochemical Principles of Pharmacy" by Florence & Attwood
Electronic References, Websites	5. GOOGLE SCHOLAR 6. Research gate 7. Compendial standards for drug preparations (from the United States Pharmacopeia–National Formulary 8. USP-NF Online 9. https://www.drugs.com/

Course Description Form

13. Course Name:	
Pharmacognosy I	
14. Course Code:	
٢٢١٠	
15. Semester / Year:	
Semester	
16. Description Preparation Date:	
06\08\2026	
17. Available Attendance Forms:	
18. Number of Credit Hours (Total) / Number of Units (Total)	
4 hours (2 theory + 2 practical)	
19. Course administrator's name (mention all, if more than one name)	
Name: Murtadha Saleh Hussein	
Email:	
20. Course Objectives	
Course Objectives	➤ General Objectives ❖ Understand the origin, nature, and classification of crude drugs. ❖ Recognize the significance of natural sources in pharmaceutical sciences. ❖ Apply methods of identification, extraction, and evaluation of natural drug products. ❖ Analyze plant-based products using chromatographic and morphological techniques. ➤ Specific Learning Objectives ❖ Define core concepts of Pharmacognosy and types of natural drug sources. ❖ Describe classification systems and taxonomy of crude drugs. ❖ Apply knowledge of collection and storage methods to real-life cases. ❖ Analyze differences between various natural drug products. ❖ Evaluate quality and deterioration factors in herbal drugs. ❖ -Design a procedure to extract and separate bioactive constituents.
21. Teaching and Learning Strategies	
Strategy	Lectures with multimedia presentations Brainstorming and group discussions Case-based and problem-based learning Laboratory experiments and hands-on training Concept mapping and peer learning Use of e-learning platforms and visual aids

22. Course Structure(theory)

Week	Hours	Required Learning Outcomes	Unit or Subject Name	Learning Method	Evaluation Method
1	2	Define Pharmacognosy and its scope; classify natural products.	Introduction to Pharmacognosy	Lectures, Brainstorming, Peer learning	Quizzes, Participation
2	2	Explain classification and nomenclature of crude drugs.	Classification of crude drugs	Concept mapping, Group work	Assignments, Reports
3	2	Apply taxonomy in identifying medicinal plants.	Plant taxonomy and nomenclature	Case-based learning, Multimedia	Quizzes, Short tests
4,5	4	Describe and perform collection/storage of crude drugs.	Production of crude drugs	Practical sessions, Group discussion	Lab reports, Evaluation
6	2	Understand deterioration causes and effects.	Deterioration of crude natural products	Lecture, Visual discussion	Participation, Worksheet
7	2	Identify major chemical groups in natural drugs.	Natural product chemistry	Multimedia, Experimentation	Lab quiz, Homework
8	2	Evaluate drug quality using various methods.	Quality control and evaluation	Hands-on testing, Peer review	Practical exam, Worksheets
9,10	4	Explain chromatography and separation techniques.	Chromatographic methods	Lab demos, Analytical comparison	Final evaluation, Presentation

Practical Course Structure

Week	Hours	Required Learning Outcomes	Practical Topic	Learning Method	Evaluation Method
1	2	Understand the basic concepts and applications of chromatography.	Introduction to Chromatography	Instructor demo, Group experiment	Lab report, Participation
2	2	Apply paper chromatography techniques (circular and horizontal).	Paper Chromatography	Hands-on lab, Peer learning	Lab assessment, Quiz
3	2	Perform	Thin-Layer	Team-based	Practical

		Thin-Layer Chromatography (TLC).	Chromatography	lab work	exam
4	2	Prepare and analyze TLC on microscope slides.	TLC on Microscope Slides	Individual experiment	Report and observation
5	2	Use partition chromatography for essential oils.	Partition Chromatography	Video-based learning, Lab	Interpretation task
6	2	Evaluate the effect of adsorbents on Rf values.	Adsorbents and Rf Values	Analytical comparison	Short test

23. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 80%

- Midterm Exam: 20 Marks

- Final Exam: 60 Marks

B. Practical: 20%

Lab Performance & Reports: 20 Marks

24. Learning and Teaching Resources

Main references (sources)	Main references (sources): Trease and Evans Pharmacognosy, 16th Edition Textbook of Pharmacognosy by Tyler, Laboratory Manual in Pharmacognosy
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Course Description Form

25. Course Name:					
Pharmaceutical calculation					
26. Course Code:					
118					
27. Semester / Year:					
Semester					
28. Description Preparation Date:					
06\08\2026					
29. Available Attendance Forms:					
30. Number of Credit Hours (Total) / Number of Units (Total)					
4 hours (2 theory, 2 practice)					
31. Course administrator's name (mention all, if more than one name)					
Name: dr. safaa Hussein ganduh					
Email: Safaa.kandooh@qu.edu.iq					
32. Course Objectives					
Course Objectives		❖ It involves computation of pharmaceutical ingredients, dosage forms, pharmaceutical formulations of extemporaneous compounding, and biological parameters of drug substances. ❖ The course teaches calculations for dilution and concentration of different types of liquids and those involved in preparing isotonic solutions, electrolyte solutions and intravenous admixtures.			
33. Teaching and Learning Strategies					
Strategy		❖ Lectures with multimedia presentations To deliver theoretical knowledge using visual aids, animations, and real-life industry examples. ❖ Case studies and real-world scenarios To analyze industrial problems and regulatory challenges, enhancing problem-solving and critical thinking skills. ❖			
34. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1 and 2	10	Dilution and concentration of pharmaceutical preparations		❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on

				activities ❖ E-learning tools ❖ Projects and assignments	Assessments ❖ Student Presentations ❖ Participation and Engagement
3,4	6	Isotonic solutions.		❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
5,6	6	Electrolyte solutions (milliequivalents, and milliosmoles)		❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

7.8	2	INTERPRETATION PRESCRIPTIONS AND MEDICATION ORDER		❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
9.10	6	Constituted solutions, admixtures and flow calculations.	.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

35. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 100%

Component	Marks	Description
Daily Oral Questions/Quizzes	5	Short oral or written quizzes to assess understanding
Assignments/Reports	2	Theory-based assignments, critical analysis, literature reviews
Midterm Exam	8	Standard exam to assess knowledge of the first half of the course
Final Exam	60	Cumulative exam covering the full course content
Attendance & Participation	5	Active participation in theoretical lectures

36. Learning and Teaching Resources

Main references (sources)	Pharmaceutical Calculations 13th Edit Howard C. Ansel, PhD Professor and D Emeritus College of Pharmacy University Georgia Athens, Georgia

Course Description Form

37. Course Name: Analytical Chemistry	
38. Course Code: 113	
39. Semester / Year: 1 st Semester , 1 st Class	
40. Description Preparation Date: 06\08\2026	
41. Available Attendance Forms: First Stage / Official Attendance	
42. Number of Credit Hours (Total) / Number of Units (Total) :75 (45h. theory + 30h.Practical)/4 5 hours (3 theory, 2 practice)	
43. Course administrator's name (mention all, if more than one name) Name: Prof. Dr. Azhar A. Ghali Email: azhar.ghali@qu.edu.iq	
44. Course Objectives	
Course Objectives	❖ To develop academic education in the university and college in accordance with quality standards in higher education that enable universities to produce outputs that can engage in the labor market. ❖ To recognize the importance of volumetric analysis and how to use its laws. ❖ To identify the tools, glassware, and materials and how to handle them appropriately ❖ To understand topics related to volumetric analysis, including solubility product, normal and molal and molar concentrations, etc. ❖ To familiarize students with weak and strong acids and bases and the types of indicators used in titration.
45. Teaching and Learning Strategies	
Strategy	❖ Lectures with multimedia presentations To deliver theoretical knowledge using visual aids, animations, and real-life analytical examples. ❖ Case studies and real-world scenarios To analyze analytical problems and regulatory challenges, enhancing problem-solving and critical thinking skills. ❖ Group discussions and collaborative learning To encourage active participation, idea exchange, and teamwork in analytical chemistry practices. ❖ Student presentations and seminars To encourage self-learning and effective communication on analytical chemistry-relevant topics.
46. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Review of elementary concept	Review of the concepts adopted in chemical analysis	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
2-5	11	The evaluation of analytical data	Evaluation of analytical methods and study of the introduction to gravity-based analyses	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
6	4	weight and concentration units	Study of the extent of application of gravity-based analyses	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
7-8	5	An introduction to volumetric methods of analysis	Volume-based analysis studies	❖ Lectures with multimedia ❖ Self-directed learning	❖ Midterm and Final Exams

				❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
9	3	Buffer solutions	Buffer solutions and standard study of equilibrium in simple solutions.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
10-12	9	Theory of neutralization titrations	Standard study of equilibrium in complex and precipitation solutions	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement
13-14	6	Equilibria in oxidation-reduction system	Equilibrium in redox reactions and study of standard theories of redox reactions.	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and

				❖ Projects and assignments	Engagement
15	4	Spectrophotometric analysis	Study of spectral analysis methods	❖ Lectures with multimedia ❖ Self-directed learning ❖ Group work and peer learning ❖ Hands-on/practical activities ❖ E-learning tools ❖ Projects and assignments	❖ Midterm and Final Exams ❖ Quizzes and Short Tests ❖ Assignments and Reports ❖ Practical/Hands-on Assessments ❖ Student Presentations ❖ Participation and Engagement

47. Course Evaluation

Course Evaluation Breakdown (Total: 100 Marks)

A. Theory Component – 80 Marks (80%)

Component	Marks	Description
Daily Oral Questions/Quizzes	5	Short oral or written quizzes to assess understanding
Assignments/Reports	2	Theory-based assignments, critical analysis, literature reviews
Midterm Exam	8	Standard exam to assess knowledge of the first half of the course
Final Exam	60	Cumulative exam covering the full course content
Attendance & Participation	5	Active participation in theoretical lectures

Subtotal (Theory): 80 Marks

B. Practice Component – 20 Marks (20%)

Component	Marks	Description
1. Practical Attendance	3	Presence and punctuality in practical sessions
2. Lab/Fieldwork Performance	3	Hands-on skills, use of equipment, teamwork
3. Practical Reports	4	Quality and accuracy of lab reports or fieldwork documentation
4. Practical Exam	10	End-of-course practical evaluation or OSPE

48. Learning and Teaching Resources	
Required textbooks (curricular books, if any)	Fundamentals of Analytical Chemistry
Main references (sources)	Fundamentals of Analytical Chemistry by Skoog & West.
Recommended books and references (scientific journals, reports...)	Analytical Chemistry Gary D. Christien
Electronic References, Websites	10. GOOGLE SCHOLAR 11. Research gate

Course Description Form

49.	Course Name: Organic chemistry I
50.	Course Code: 1210
51.	Semester / Year: semester 2/ 1 st
52.	Description Preparation Date: 06\08\2026
53. Available Attendance Forms:	
54. Number of Credit Hours (Total) / Number of Units (Total)	
45 hours/ 4 units	
55. Course administrator's name (mention all, if more than one name)	
Name: Ahmed M. H. Abudken Email: Ahmed.Merzah@qu.edu.iq Name: Lena saadi Email: lana.saadi@qu.edu.iq	
56. Course Objectives	
Course Objectives	1. Provide a thorough understanding of organic chemistry principles relevant to pharmaceutical sciences. 2. Develop students' problem-solving and critical thinking skills through theoretical and practical learning. 3. Enhance laboratory competencies for safe and accurate chemical experimentation. 4. Foster interdisciplinary connections between organic chemistry and pharmacology, medicinal chemistry, and drug development. 5. Prepare students for advanced academic, research, and professional pathways in pharmacy.
57. Teaching and Learning Strategies	
Strategy	• Interactive lectures supported by multimedia and real-world examples. • Laboratory sessions for practical skill development and experiential learning. • Group discussions and presentations to foster collaboration and communication skills. • Continuous assessment through quizzes, assignments, and lab reports to monitor learning.

progress.

58. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3		Introduction.	Using blackboard and slides	Written and oral exams
2-3	6		Alkane		
3-4	5		Alkene		
4-6	5		Alkyne		
7-8	4		Stereochemistry		
9-11	8		Alcohols and ether		
12-13	10		Aromatic chemistry		
14-15	4		Cycloalkane		

59. Course Evaluation

- **Written exams** (midterm and final) to assess theoretical understanding.
- **Quizzes and assignments** for continuous assessment and reinforcement of concepts.
- **Laboratory reports and practical exams** to evaluate hands-on skills and scientific accuracy.

60. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Organic Chemistry by Robert T. Morrison and Robert N. Boyd. (Latest edition)
Main references (sources)	Organic Chemistry by McCurry; Thomas learning; CA, USA; Latest edition.
Recommended books and references (scientific journals, reports...)	Organic chemistry by Clayden, Greeves, Warren and Wothers, (Latest edition).
Electronic References, Websites	

Course Description Form

61.	Course Name: Advanced Pharmaceutical Analyses
62.	Course Code: 5210
63.	Semester / Year: semester 2/ 5 th
64.	Description Preparation Date: 06\08\2026
65. Available Attendance Forms:	
66. Number of Credit Hours (Total) / Number of Units (Total)	
45 hours/ 4 units	
67. Course administrator's name (mention all, if more than one name)	
Name: Ahmed M. H. Abudken Email: Ahmed.Merzah@qu.edu.iq Name: Azhar A. Gali Email:	
68. Course Objectives	
Course Objectives	6. To develop a solid understanding of the principles and applications of UV-visible, Mass, IR, and NMR spectroscopy. 7. To enhance students' ability to interpret spectral data for the identification and analysis of pharmaceutical compounds. 8. To provide hands-on experience with spectroscopic instruments and techniques used in pharmaceutical analysis. 9. To strengthen critical thinking and problem-solving skills in the context of analytical chemistry. 10. To prepare students for careers in pharmaceutical research, quality control, and regulatory sciences.
69. Teaching and Learning Strategies	
Strategy	• Interactive lectures supported by multimedia and real-world examples. • Laboratory sessions for practical skill development and experiential learning. • Group discussions and presentations to foster collaboration and communication skills. • Continuous assessment through quizzes, assignments, and lab reports to monitor learning.

progress.

70. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3 3-8 8-12 13-15	10 14 12 9		• UV visible spectroscopy • Infra Red spectroscopy • Nuclear magnetic Resonance • Mass spectroscopy	Using blackboard and slides	Written and oral exams

71. Course Evaluation

- **Written exams** (midterm and final) to assess theoretical understanding.
- **Quizzes and assignments** for continuous assessment and reinforcement of concepts.
- **Laboratory reports and practical exams** to evaluate hands-on skills and scientific accuracy.

72. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Spectrometric identification of Organic Compounds by Robert M. Silverstein (Latest edition)
Main references (sources)	Organic Chemistry by McCurry; Thomas learning; CA, USA; Latest edition.
Recommended books and references (scientific journals, reports...)	Organic chemistry by Clayden, Greeves, Warren and Wothers, (Latest edition).
Electronic References, Websites	

