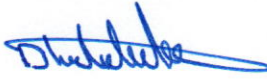


## Course Description Form

١. Course Name: Pharmaceutical Biotechnology	
٢. Course Code:	
٣. Semester / Year: Second semester /Fifth stage	
٤. Description Preparation Date: ١٨/٢/٢٠٢٤	
٥. Available Attendance Forms: Theoretical lectures,	
٦. Number of Credit Hours (Total) / Number of Units (Total)	
١٥ theoretical hours / ١	
٧. Course administrator's name (mention all, if more than one name)	
Dr. dhurgham.alfahad@sci.utq.edu.iq 	
٨. Course Objectives	
<b>Course Objectives</b>	<p>The course objectives of the Pharmaceuticals Biotechnology are</p> <ol style="list-style-type: none"> <li>١. Understanding the principles and concepts of biotechnology as applied to the pharmaceutical industry.</li> <li>٢. Exploring the different techniques and methodologies used in pharmaceutical biotechnology research and development.</li> <li>٣. Gaining knowledge of the various types of pharmaceutical biotechnology products, including biologics, biosimilars, and gene therapies.</li> <li>٤. Understanding the regulatory framework and ethical considerations in the development and commercialization of pharmaceutical biotechnology products.</li> <li>٥. Analyzing the impact of pharmaceutical biotechnology on drug discovery, development, and therapeutic interventions.</li> <li>٦. Familiarizing with the process of bioprocessing and manufacturing of pharmaceutical biotechnology products.</li> <li>٧. Exploring the applications of pharmaceutical biotechnology in personalized medicine and precision therapeutics technologies.</li> </ol>
٩. Teaching and Learning Strategies	
<b>Strategy</b>	Teaching and learning strategies that are often used in Pharmaceutical Biotechnology courses Lectures: Instructors may deliver lectures to provide theoretical knowledge and foundational concepts in Pharmaceutical Biotechnology. This can include discussions on principles,



techniques, and applications of biotechnology in the pharmaceutical industry.

### 10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	Biotechnology - introduction	Biotechnology - introduction	Theoretical lectures, e-learning and student groups	Written exam Scientific reports Quarterly exams Daily surprise exams Discussions inside the hall
2	4	Formulation of biotechnology product (biopharmaceutical consideration) Microbial consideration-sterility-pyrogen viral decontamination Excipients of parenteral products - solubility enhancer-anti adsorption agents buffer components-preservatives – osmotic agents	Formulation of biotechnology product (biopharmaceutical consideration) Microbial consideration-sterility-pyrogen viral decontamination Excipients of parenteral products - solubility enhancer-anti adsorption agents buffer components-preservatives – osmotic agents)		
3	0	Route of administration Parenteral route Oral route Alternative routes ( nasal-pulmonary-rectal-buccal transdermal )	Route of administration Parenteral route Oral route Alternative routes ( nasal-pulmonary-rectal-buccal transdermal )		
4	1	Pharmacokinetic of peptides and proteins Introduction Elimination of proteins (proteolysis-excretion-metabolism )	Pharmacokinetic of peptides and proteins Introduction Elimination of proteins (proteolysis-excretion-metabolism )		

### 11. Course Evaluation

Midterm exam - 20 marks

Weekly reports - 0 marks

Daily surprise exams - 0 marks

End of course exam - 70 marks

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Pharmaceutical Biotechnology. Fundamental and applications. Fourth Edition. Daan J.A, Crommelin
Main references (sources)	
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	



## Course Description Form for the year 2023-2024

1. Course Name:	
Pharmacognosy I	
2. Course Code:	
3. Semester / Year:	
Second/ Second Semester	
4. Description Preparation Date:	
24/2/2024	
5. Available Attendance Forms:	
Present and integrated	
6. Number of Credit Hours (Total) / Number of Units (Total)	
75 Hours/(45 theoretical + 30 practical)	
7. Course administrator's name (mention all, if more than one name)	
Name: Hussein Ali Email: <i>hussein@utq.edu.iq</i> Name: Rawa auda hussein Email: rawaauda@utq.edu.iq	
8. Course Objectives	
Course Objectives	<ol style="list-style-type: none"><li>1. Knowledge of plant preparations by providing students with a sound theoretical background in the principles of medicinal drugs, classification and naming of medicinal plants, plant parts that contain plant compounds with medicinal efficacy, methods of cultivation and propagation of them industrially and laboratory (tissue culture), collection, storage and packaging, types of commercial fraud, and types of extraction, isolation and purification using Various chromatography techniques</li><li>2. Study the principles of chemistry of plant products (chemical families) and the chemical families of active compounds.</li><li>3. Teaching students to diagnose the various plant parts containing medicinal plant compounds, methods and means of extraction and purification (using the chromatography plate method), and color-coded identification of chemical families using a theoretical and practical program prepared for this purpose so that the graduate is able to use laboratory equipment in extracting the active substance from plant and animal sources. Isolate and purify it.</li></ol>



4. Confronting the current and future needs of the practice of pharmacy and clarifying the direction and field of herbal medicine through continuous, renewed research and searching local natural materials for treatments to deal with endemic diseases by providing safe and effective natural medicines that meet the needs.
5. A detailed study of active chemical groups, their locations in plants, their effects, and the medicines they contain.
6. The student is taught laboratory safety rules, and the safe handling of chemicals, glassware, laboratory equipment and supplies.

### 9. Teaching and Learning Strategies

<b>Strategy</b>	<ol style="list-style-type: none"> <li>1. A series of theoretical lectures that are delivered in classrooms in person, in which in-person teaching methods are used, enhanced by interactive learning means such as interactive whiteboards, electronic programs, and display screens, enhanced by blended distance learning (e-learning), in which the study lectures are provided with video explanations, and educational means enhanced by questions and assignments. Home lessons, educational and short films, and illustrations for each of the above chapters.</li> <li>2. Discussion circles prepared by students under the supervision of teachers for the purpose of enhancing the scientific material with everything that is new related to the studied or related topics.</li> <li>3. Read methodological and helpful books to enhance self-learning ability.</li> <li>4. Organizing a series of practical laboratory experiments designed to enhance understanding of the theoretical material, including conducting experiments and teaching how to safely deal with chemicals, laboratory devices and equipment, teaching how to work in small and individual work teams, and teaching how to prepare practical experiment reports.</li> <li>5. Participate in scientific discussions through questions related to the subject that are presented for discussion within the discussion for the purpose of teaching students the methods and principles of scientific discussions and controversy.</li> </ol>
-----------------	---

### 10. Course Structure ( Theoretical part)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	4	Identify the general principles of medical pharmacology and sources of medicines from natural products	General introduction: principles of drugs, definition and Overview and sources of raw natural medicines And official and unofficial medicines	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing



2	4	Introducing natural products, their hosts, and methods of naming plants scientifically	Classification of natural products and classification and naming of plants	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
3	4	Introducing the methods, their advantages and disadvantages	Production of raw medicines: cultivation, collection, drying and storage.	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
4	4	Definition of deteriorating conditions	Degradation of raw natural products	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
5	4	Introducing the families of natural products and examples of their compounds and medical uses	Chemistry of natural products drugs and pharmacological effectiveness of natural products	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
5	4	Introducing the families of natural products and examples of their	Chemistry of natural products drugs and pharmacological effectiveness of natural products	Theoretical lectures using various scientific methods and	Oral, written and surprise examinations and various other means of testing



		compounds and medical uses		means of explanation, electronic, in-person and combined	
6	4	Introducing the methods, their advantages and disadvantages	Introducing the methods, their advantages and disadvantages	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
<b>MIDE TERM EXAM (2 WEEKS)</b>					
7	4	Defining the methods and classifying them according to the extraction mechanism	Separation techniques: Introduction and separation and classification mechanisms based on the type of technology.	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
8	4	Introducing the method, its mechanism of action, its advantages and disadvantages	Paper and thin layer chromatography	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
9	4	Introducing the method, its mechanism of action, its advantages and disadvantages	Ion exchange chromatography and filtration Jelly	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing



10	3	Introducing the method, its mechanism of action, its advantages and disadvantages	Column chromatography and high-performance	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
11	3	Introducing the method, its mechanism of action, its advantages and disadvantages	Gas chromatography and affinity	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing
12	3	Introduction to the method, its advantages and limitations	Plant tissue culture	Theoretical lectures using various scientific methods and means of explanation, electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing

**FINAL TERM EXAM (2 WEEKS)**

<b>Course Structure ( Practical part)</b>					
<b>Week</b>	<b>Hours</b>	<b>Required Learning Outcomes</b>	<b>Unit or subject name</b>	<b>Learning method</b>	<b>Evaluation method</b>
1	2	Introduction to technology and use	Partial measurement and zoom	A practical laboratory lecture with illustrative materials and short scientific films	Oral and written exams, surprise exams, and other testing methods



2	2	Introduction to technology and use	Microscopic identification of crude drugs and cell contents	An applied laboratory lecture with illustrative materials	Oral and written exams, surprise exams, and other testing methods
3	2	Introduction to technology and use	Extraction and separation techniques: potato starch extraction	Laboratory lecture with conducting a laboratory experiment and writing a report on the experiment	Oral and written exams, surprise exams, writing a test report, the validity of analytical calculations, and other testing methods.
4	2	Introduction to technology and use	Extraction and separation techniques: Extracting caffeine from tea	Laboratory lecture with conducting a laboratory experiment and writing a report on the experiment	Oral and written exams, surprise exams, writing a test report, the validity of analytical calculations, and other testing methods.
5	2	Introduction to technology and use	Chromatography: paper chromatography (paper chromatography). circular and horizontal)	Laboratory lecture with conducting a laboratory experiment and writing a report on the experiment	Oral and written exams, surprise exams, writing a test report, the validity of analytical calculations, and other testing methods.
6	2	Introduction to technology and use	Introduction to Thin Layer Chromatography: Thin layer	Laboratory lecture with conducting a laboratory	Oral and written exams, surprise



			chromatography on slides Microscope	experiment and writing a report on the experiment	exams, writing a test report, the validity of analytical calculations, and other testing methods.
7	2	Introduction to technology and use	Introduction to Thin Layer Chromatography: Thin layer chromatography on commercial light aluminum	Laboratory lecture with conducting a laboratory experiment and writing a report on the experiment	Oral and written exams, surprise exams, writing a test report, the validity of analytical calculations, and other testing methods.
8	2	Introduction to technology and use	Chromatography to separate volatile oils	Laboratory lecture with conducting a laboratory experiment and writing a report on the experiment	Oral and written exams, surprise exams, writing a test report, the validity of analytical calculations, and other testing methods.
9	2	Introduction to technology and use	The effect of the activity of sorbents on the values of the impediment factor	Laboratory lecture with conducting a laboratory experiment and writing a report on the experiment	Oral and written exams, surprise exams, writing a test report, the validity of analytical calculations, and other testing methods.

FINAL TERM EXAM



## 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

## 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	<ul style="list-style-type: none"><li>• Pharmacognosy by Tyler</li><li>• Pharmacognosy and Pharmacobiotechnology by Robbers.</li><li>• Fundamentals of pharmacognosy and phytotherapy by Heinrich. 2017</li><li>• Texbook of Pharmacognosy and Phytochemistry.</li></ul>
Main references (sources)	<ul style="list-style-type: none"><li>• Trease and Evans pharmacognosy by Evans. 15th ed., 2009.</li></ul>
Recommended books and references (scientific journals, reports...)	<ul style="list-style-type: none"><li>• International Journal of Pharmacognosy and Phytochemical Research.</li><li>• Journal of Pharmacognosy and Phytochemistry.</li><li>• Journals of Pharmacognosy and Natural Products.</li></ul>
Electronic References, Websites	



## Course Description Form

<b>1. Course Name:</b>					
Industrial Pharmacy I					
<b>2. Course Code:</b>					
<b>3. Semester / Year:</b>					
Fourth stage/ second semester					
<b>4. Description Preparation Date:</b>					
24/2/2024					
<b>5. Available Attendance Forms:</b>					
In-person/combined with remote electronic in cases of make-up lessons (in the case of frequent holidays) for the purpose of not completing the curriculum					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
60 hours (45 theoretical + 15 practical) / 4 units					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Name: Assist lecturer lina salim hussein					
Email: linasalim@utq.edu.iq					
<b>8. Course Objectives</b>					
<b>Course Objectives</b>					
Knowing some of the basics of pharmacy, including the methods used in the pharmaceutical industry in factories, such as grinding, blending, mixing, drying, packaging, and sterilization of various types of pharmaceutical forms. As well as learning about different types of sterile products.					
Identify the specifications of drug raw materials and additives appropriate for each drug form.					
3. Preparing modern methods for drug production and composition, providing scientific consultations on problems of composition and drug manufacturing and their solutions, and identifying any change in characteristics and properties in the event of an incompatibility between substances in the drug dosage.					
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>	<p>1. A series of theoretical study lectures delivered in classrooms in person, in which in-person teaching methods are used, enhanced by interactive learning methods such as interactive whiteboards and electronic programs, enhanced by blended distance learning (e-learning), in which theoretically explained study lectures are available in video formats, and learning methods enhanced by questions and homework assignments. And illustrations..</p> <p>2. Read methodological and helpful books to enhance self-learning ability.</p> <p>3. Participate in scientific discussions through questions related to the subject that are presented for discussion within the discussion for the purpose of teaching students the methods and principles of scientific discussions and debate.</p>				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-3	7	Introducing the principles and basics of pharmaceutical factories regarding the mixing process	Principles of pharmaceutical manufacturing processing: Mixing: liquid mixing, flow and its characteristics, mixing mechanisms, mixing equipment, meal mixing, and continuous mixing.	Theoretical lectures using various scientific clarification methods,	Written exams



3-5	7	Introducing the principles and basics of pharmaceutical factories regarding the grinding process	Mixer selection: solid mixing theory and Variables related to solid bodies. Milling: forces and mechanisms. And pharmaceutical application. Trituration energy and the theory of volume measurement method; Choosing grinding techniques depending on the characteristics of the grinder and the type of material to be grinded		
5-7	7	Learn about drying materials, its methods and principles	Drying: definition and purpose Moisture measurement: drying theory, solids drying, dryer classification, specialty drying and its methods.		
8-10	9	Learn about clarification and filtration methods	Purification and filtration: The theory and theory of purification and filtration media and their types. Integration testing: equipment and systems (commercial and laboratory)		
11-13	7	Learn about different sterilization methods	Sterilization; validation of methods; Kinetics of		



13-15	8	Identify sterile products  Sterile products: development, formulation, production, processing, control and quality	microbial death. Sterilization methods (thermal and non-thermal); mechanisms; evaluation.	
-------	---	--	--	--

**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  
 15 marks for mid exam  
 5 marks for attendance and daily exams for theoretical lectures  
 5 grade weekly reports  
 15 marks distributed between daily exams in the laboratory and one or more summative exams that include several laboratory subjects at the end of the course and completion of all experiments.  
 60 marks final exam

**12. Learning and Teaching Resources**

Required textbooks (curricular books, if any)

- .1The Theory and Practice of Industrial Pharmacy by Herbert Lieberman and Leon Lachman. 2009
- .2A practice guide to contemporary pharmacy practice (latest ed.).
- .3Pharmaceutical Dosage Forms and Drug Delivery Systems
- .4Applied Pharmaceutical Practice

Main references (sources)

- 1. Allen, L. V. P. N. G. a. H. C. a. H. C. 2005. Ansel's pharmaceutical dosage forms and drug delivery systems, Philadelphia, Lippincott Williams & Wilkins.
- 2. Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3ed Michael E. Aulton (Author). Churchill, Livingstone- Elsevier
- 3. British Pharmacopoeia (BP)
- 4. United States Pharmacopeia (USP) and National Formulary

Recommended books and references (scientific journals, reports...)







## Course Description Form

1. Course Name:

Pharmaceutical technology I

2. Course Code:

3. Semester / Year:

Third stage / second semester

4. Description Preparation Date:

24/2/2024

5. Available Attendance Forms:

In-person/combined with remote electronic in cases of make-up lessons (in the case of frequent holidays) for the purpose of not completing the curriculum

6. Number of Credit Hours (Total) / Number of Units (Total)

60 hours (45theoretical + 15practical)/4 units

7. Course administrator's name (mention all, if more than one name)

Name: Assist lecturer lina salim husseain

Email: linasalim@utq.edu.iq

8. Course Objectives

**Course Objectives.....**

1. Knowing the basics of pharmacy, including the basics of making pharmaceutical formulations in the form of solutions or dispersed systems with various properties, composition, and methods of classification.
2. Identify the different types and forms of medicinal products, their preparation methods, and their specifications.
3. Preparing modern methods for drug production and composition and providing scientific consultations on the problems of composition and drug manufacturing and their solutions.

9. Teaching and Learning Strategies

**Strategy**

1. A series of theoretical lectures that are delivered in classrooms in person, in which in-person teaching methods are used, enhanced with interactive learning methods such as interactive whiteboard, electronic programs, and display screens, enhanced with blended distance learning (e-learning), and enhanced learning methods such as questions, homework, and illustrative pictures.
2. Read methodological and helpful books to enhance self-learning ability.
3. Participate in scientific discussions through questions related to the subject that are presented for discussion in the hall for the purpose of teaching students the methods and principles of scientific discussions and debate.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-6	16	Dispersed systems: their classification; Comparisons between different	Dispersed systems, solutions, types of solutions and their classifications in different ways.	Theoretical lectures using various scientific clarification methods.	Written exams



6-7	4	<p>systems. Solubility: Factors affecting solubility. Expressions of solubility;. As well as methods for preparing solutions containing substances Non-volatile and its uses.</p>	<p>Solubility: Factors affecting solubility. Preparation of solutions containing non-volatile materials. and uses. Official solutions; classification of official solutions; preparation and uses. Aqueous solutions containing aromatic principles; aromatic waters; methods of preparations; stability.</p>		
		<p>Identifying various types of syrups, their ingredients, and methods of preparation. As well as preparing aromatic water in several ways and learning about its different classifications and most important uses</p>	<p>syrups: a syrup containing sugar; Artificial sugars and sorbitol; Stability of beverages. And aromatic waters.</p>		
7-8	3	<p>Identify the solutions prepared using the mixed solvent systems including elixir and Spirit and their various properties and uses.</p>	<p>Preparation of solutions using mixed solvent systems including elixirs and spirits</p>		
8-9	3	<p>Identify the different purification methods, as well as the factors affecting the purification and filtration process, and the importance and characteristics of the filter aids</p>	<p>Definition and methods of purification; And filter aids</p>		



9-11	7	Learn about extraction processes; maceration and percolation, and types of extracted solutions, such as tinctures and others.	extraction processes; maceration and percolation		
12-13	6	A comprehensive introduction to the dispersed systems, identifying suspensions, techniques for preparing them, and evaluating their quality	Dispersed systems, Coarse dispersion; suspensions.		
14-15	6	Identifying the colloidal dispersion, its characteristics, types, and methods for distinguishing it from the true solutions	Colloidal dispersion: lipophilic and lipophobic		

### 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  
 15 marks for mid exam  
 5 marks for attendance and daily exams for theoretical lectures  
 5 grade weekly reports  
 15 marks distributed between daily exams in the laboratory and one or more summative exams that include several laboratory subjects at the end of the course and completion of all experiments.  
 60 marks final exam .

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	.1Pharmaceutical Dosage forms and Drug Delivery Systems By Haward A. Ansel; latest edition.
Main references (sources)	.1Allen, L. V. P. N. G. a. H. C. a. H. C. 2005. Ansel's pharmaceutical dosage forms and drug delivery systems, Philadelphia, Lippincott Williams & Wilkins. .2Altons pharmaceutics (the design & manufacturing of drugs) 3rd ed. .3 Martin's physical pharmacy and pharmaceutical sciences, Patrick J. Sinko . Wolters Kluwer. Lippincott Williams &Wilkins. Philadelphia. 7044.



Recommended books and references  
(scientific journals, reports...)

Electronic References, Websites



## Course Description Form

<b>1. Course Name:</b>					
Physical pharmacy I					
<b>2. Course Code:</b>					
<b>3. Semester / Year:</b>					
Second stage / first semester					
<b>4. Description Preparation Date:</b>					
25/2/2024					
<b>5. Available Attendance Forms:</b>					
In-person/combined with remote electronic in cases of make-up lessons (in the case of frequent holidays) for the purpose of not completing the curriculum					
<b>6. Number of Credit Hours (Total) / Number of Units (Total)</b>					
60 hours (45theoretical + 15practical)/ 4 units					
<b>7. Course administrator's name (mention all, if more than one name)</b>					
Name: Assist lecturer lina salim husseein					
Email: linasalim@utq.edu.iq					
<b>8. Course Objectives</b>					
<ol style="list-style-type: none"> <li>1. Identify the different states of matter - solid, liquid, and gaseous - and the characteristics and features of each state</li> <li>2. Enabling students to collect information in a systematic and scientific manner to establish scientific facts and principles to solve problems and distinguish between the requirements for preparing pharmaceutical forms for the purpose of producing efficient pharmaceutical formulas and preparing them for the body.</li> <li>3. Understand the thermodynamics of materials</li> <li>4. Identify conductive solutions and non-conductive solutions</li> <li>5. Understanding the principles of ionic equilibria</li> <li>6. Understanding buffer solutions, their preparation and specifications</li> </ol>					
<b>9. Teaching and Learning Strategies</b>					
<b>Strategy</b>	<ol style="list-style-type: none"> <li>1. A series of theoretical lectures delivered in classrooms in person, in which in-person teaching methods are used, enhanced by interactive learning methods such as interactive whiteboards, electronic programs, display screens, and enhanced learning methods such as questions, homework, and illustrative images.</li> <li>2. Read methodological and helpful books to enhance self-learning ability.</li> <li>3. Participate in scientific discussions through questions related to the subject that are presented for discussion in the hall for the purpose of teaching students the methods and principles of scientific discussions and debate.</li> </ol>				
<b>10. Course Structure</b>					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1-4	10	Understanding the role of interfacial forces	States of matter, binding forces between	Theoretical lectures using various	Written exams



4-6	8	<p>Understanding the thermodynamics of materials</p> <p>between material molecules in forming the state of matter, as well as the difference in properties and features between different forms of matter. As well as knowing the most important methods of thermal decomposition</p>	<p>Thermodynamics, first law, thermochemistry, second law, free energy function and applications.</p> <p>Solutions of non-electrolytes, properties, ideal and real Colligative properties, molecular weight determination.</p>	<p>scientific clarification methods</p>
7-9	7	<p>Understand the properties of non-conductive solutions</p>	<p>Solution of electrolytes, properties, Arrhenius theory of dissociation, theory of strong electrolytes, ionic strength, Debye-Huckel theory, coefficients for expressing colligative properties.</p>	
9-10	5	<p>Understand the properties of electrically conductive solutions</p>	<p>Ionic equilibria, modern theories of acids, bases and salts, acid-base equilibria, calculation of pH, acidity constants, the effect of ionic strength and free energy.</p>	
11-13	8	<p>Understand the principles and importance of ionic balance</p>		



**Course Description Form**

1. Course Name: Medical pharmacognosy II

2. Course Code:

3. Semester / Year: Third stage / first semester

4. Description Preparation Date: 21/2/2024

5. Available Attendance Forms: In-person lectures and online integration to compensate the lessons for official holidays

6. Number of Credit Hours (Total) / Number of Units (Total):  
45 hr theoretical and practical / 3 units

7. Course administrator's name (mention all, if more than one name)

Name: Najwa Abdul-Ameer Daffar

Email: phnajwa81@gmail.com



8. Course Objectives

Course Objectives

- Identifying the principle of pharmacognosy, biosynthesis of various primary and secondary metabolites and methods of drug extraction from plants especially.

- Clarify the relationship between some drugs that extracted from plant and the pharmacology branch

and how it acts and performs within the human body



9. Teaching and Learning Strategies		10. Course Structure	
<ul style="list-style-type: none"> <li>Identify the effectiveness of some medicinal drugs in treating many human diseases.</li> </ul>		<p>Delivering lectures according to the available projectors method and the available laboratory equipment for plant extraction.</p>	
9. Teaching and Learning Strategies		10. Course Structure	
Evaluation method	Learning method	Unit or subject name	Required Learning Outcomes
<p>Daily session with discussion of questions after the quiz Mid and Final exam</p>	<p>Theoretical and online lectures Practical and student groups</p>	<p>Introduction The Biosynthetic pathways of Secondary metabolite which are the Glycosides</p>	<p>Get an introduction to pharmacognosy, the biosynthesis pathway of medical drugs, and the identification of the first type of secondary plant metabolite which are the glycosides.</p>



Course Description Form

Course Name:	Pharmaceutical Technology-II
Course Code:	
Semester / Year:	2023-2024
Description Preparation Date:	24-2-2024
Available Attendance Forms:	
In-person/integrated electronic and remote in cases of attendance at tours and make-up lessons	
Number of Credit Hours (Total) / Number of Units (Total)	45 theoretical + 30 practical/number of units 4
Course administrator's name (mention all, if more than one name)	Name: Hussein Kadhim Alkufi Email: husseinalkufi21@utq.edu.iq
Course Objectives	<p>1. Knowing some of the basics of pharmacology, including the basics of making medicinal formulations such as powders, syrups, pills, ointments, etc., and the methods of preparing them, starting with the materials used, their stability, and their packaging.</p> <p>2. Identify the different types and forms of medicines (from their raw materials, contents, methods of preparation, stability, storage and uses), methods of preparation, specifications and takings, by enabling them to dilute or concentrate the solutions used in preparing the various forms of medicines, whether oral or topical, in addition to knowing how to calculate of materials for the preparation of emulsions, creams, ointments, capsules, suspensions and suppositories Methods of preparation.</p> <p>3. Preparing modern methods for drug production and composition, providing scientific consultations on problems of composition and drug manufacturing and their solutions, and identifying any change in characteristics and properties in the event of an incompatibility between substances in the drug dosage.</p> <p>4. The student is taught laboratory safety rules, and the safe handling of chemicals, glassware, laboratory equipment and supplies.</p>
Teaching and Learning Strategies	



Course Structure		Week	Hours	Required Learning	Unit or subject	Learning method	Evaluation method
<p>1. A series of theoretical lectures that are delivered in classrooms in person, learning methods such as interactive whiteboards, electronic programs, and display screens, enhanced by blended distance learning (e-learning), in which the study lectures are provided with video explanations, and learning methods enhanced by questions and assignments. Home lessons, educational and short films, and illustrations.</p> <p>2. Discussion seminars prepared by students under the supervision of teachers for the purpose of enhancing the scientific material with everything that is new related to the studied or related topics.</p> <p>3. Read methodological and helpful books to enhance self-learning ability.</p> <p>4. Participate in scientific discussions through questions related to the subject that are presented for discussion within the discussion for the purpose of teaching students the methods and principles of scientific discussions and debate.</p>		1-2	6	Identify emulsions, their types, methods and principles of their formation	Emulsifiers: purpose of emulsification, methods and emulsifying agents; HLB system stabilizes emulsions. And breakage and peeling	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Oral, written and surprise examinations and various other means of testing
		3-4	6	Learn about the types of Suppositories and methods of preparing them	Suppositories: their types, preparation, and types and recipes for suppository bases	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Oral, written and surprise examinations and various other means of testing
		5-7	9	Learn about ointments, creams and gels	Semi-solid preparations: fats, creams and pastes Types of ointment bases and eye ointments	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Oral, written and surprise examinations and various other means of testing



Course Description Form

Course Name:	Industrial Pharmacy-II
Course Code:	
Semester / Year:	
Fifth stage - first semester 2023/24	
Description Preparation Date:	23/2/2024
Available Attendance Forms:	
In-person/integrated electronic and remote in cases of attendance at tours and make-up lessons	
Number of Credit Hours (Total) / Number of Units (Total)	
45 theoretical + 30 practical) / number of units 4	
Course administrator's name (mention all, if more than one name)	
Name: Hussein kadhim alkufi	
Email: husseinalkufi21@utq.edu.iq	

Course Objectives

- 1\_ Knowing some of the basics of pharmacology, one of the methods for the pharmaceutical industry in factories, is how to manufacture complete pharmaceuticals for various pharmaceutical doses and learn about the specifications of pharmaceutical raw materials and appropriate additives for each pharmaceutical form by conducting experiments on how to compress pills using different methods of manufacturing in addition to different evaluation methods for pills. Such as examining decomposition, fragility, and fragmentation, as well as experiments on methods for manufacturing capsules and methods for manufacturing injections, sprays, and semi-solids.
- 2\_ Learn about analyzing the results of pharmaceutical analysis tests, discussing them, and using them in the drug design and formulation processes.
- 3\_ Preparing modern methods for drug production and composition, providing scientific consultations on problems of composition and drug manufacturing and their solutions, and identifying any change in characteristics and properties in the event of an incompatibility between substances in the drug dosage.
- 4\_ The student is taught laboratory safety rules, and the safe handling of chemicals, glassware, laboratory devices and supplies.
- 5\_ Identify methods for testing the chemical



Teaching and Learning Strategies		Course Structure				
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method	
1-2	6		Knowledge of prior drug formulation of the (Preformulation)	Theoretical lectures using various scientific methods and means of explanation, in-electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing	
3-5	9		Pharmaceutical dosage forms tablet: Its role in treatment and its advantages and disadvantages: formulation, specifications and evaluation Machines used in tablet manufacturing and control, quality and problems Granulation and methods Production Excipients (additives) and types of tablets.	Theoretical lectures using various scientific methods and means of explanation, in-electronic, in-person and combined	Oral, written and surprise examinations and various other means of testing	
6-7	6		Tablet coating equipment specifications,	Theoretical lectures using various	Oral, written and surprise examinations	

1 A series of theoretical lectures that are delivered in classrooms in person, in which in-person teaching methods are used, enhanced by interactive learning methods such as interactive whiteboards, electronic programs, and display screens, enhanced by blended distance learning (e-learning), in which the study lectures are provided with video explanations, and enhanced learning methods, including questions and homework. Educational and short films and illustrative images.

2 Discussion circles prepared by students under the supervision of teachers for the purpose of enhancing the scientific material with everything that is new related to the studied or related topics.

3 Read methodological and helpful books to enhance self-learning ability.

4 Participation in scientific discussions through questions related to the subject that are presented for discussion within the discussion for the purpose of teaching students the methods and principles of scientific discussions and controversy.

and physical validity of pharmaceutical preparations.



and various other means of testing	scientific methods and means of explanation, electronic, in- person and combined	methods and types Coating (sugar and film); quality control and problems.				
Oral, written examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, electronic, in- person and combined	Capsules: hard gelatin capsules: materials, production, filling, equipment, formulation and techniques in particular			3	8
Oral, written examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, electronic, in- person and combined	Soft gelatin capsules: manufacturing methods and nature of the capsule shell Content, processing, control and stability Partial encapsulation: core materials, coatings, stabilizers, equipment and methodology.			4	9-10
Oral, written examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, electronic, in- person and combined	Modified dosage forms (sustained release): theory, concepts and Evaluation, testing and formulation			2	10
Oral, written examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, electronic, in- person and combined	Fluids: formulation, stability and equipment			2	11
Oral, written examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, electronic, in- person and combined	Suspension systems: theory, formulation and evaluation.			2	11-12
Oral, written examinations	Theoretical lectures using various scientific methods and means of explanation, electronic, in- person and combined					



Course Evaluation			1 Final exam (60 marks)	2 Practical exam with quizzes, reports and practical experiments. (20 marks)	3 Mid-course exam (10 marks)
scientific methods and other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Emulsions: Theory, application, types, formulation and equipment Control and quality.	12	2	
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Theory, application, types, formulation and equipment Control and quality.			
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Emulsions: Theory, application, types, formulation and equipment Control and quality.			
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Semi-solids: absorption, and formulation, and types of carrier bases (compounds) Preparation, verbalization and evaluation.	13	3	
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Semi-solids: absorption, and formulation, and types of carrier bases (compounds) Preparation, verbalization and evaluation.			
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Suppositories: rectal absorption, their uses and types and rules, manufacturing processes, problems and evaluation.	14	3	
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Suppositories: rectal absorption, their uses and types and rules, manufacturing processes, problems and evaluation.			
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Pharmaceutical Aerosols: propellant gas, containers and formulation types and stability component selection, manufacturing and quality control the exams.	15	3	
and various examinations and surprise examinations and various other means of testing	Theoretical lectures using various scientific methods and means of explanation, in-person and combined	Pharmaceutical Aerosols: propellant gas, containers and formulation types and stability component selection, manufacturing and quality control the exams.			



4_ Participation in preparing and delivering seminars, scientific discussions, lunch boxes, and homework. (10 marks)	Learning and Teaching Resources	
Required textbooks (curricular books, if any)	The Theory and Practice of Industrial Pharmacy by Lachman	
Main references (sources)	<p>1_ Allen, L. V. P. N. G. a. H. C. a. H. C. 2005. Ansel's pharmaceutical dosage forms and drug delivery systems, Philadelphia, Lippincott Williams &amp; Wilkins.</p> <p>2_ Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3ed Michael E. Aulton (Author). Churchill, Livingstone-Elsevier</p> <p>3_ British Pharmacopoeia [BP]</p> <p>4_ United States Pharmacopoeia (USP) and National Formulary</p>	Recommended books and references (scientific journals, reports...)
	Electronic References, Websites	Google scholar and research gate



## Course Description Form

1. Course Name: Pharmaceutical Calculations					
2. Course Code:					
3. Semester / Year: second \ first stage					
4. Description Preparation Date: 11/11/2013					
5. Available Attendance Forms: theoretical lectures and electronic lectures on class room					
6. Number of Credit Hours (Total) / Number of Units (Total): $\text{ } \cdot \text{ theoretical hours} + \text{ } \cdot \text{ practical hours} / \text{ } \cdot \text{ theoretical} + \text{ } \cdot \text{ practical}$					
7. Course administrator's name (mention all, if more than one name) pharmacist specialty \ all muhsin hizam					
8. Course Objectives					
Course Objectives			Understanding Dosage Calculations: Learning how to accurately calculate medication dosages based on factors such as patient weight, age, and condition.		
9. Teaching and Learning Strategies					
Strategy			Presenting the necessary research and studies in the field of pharmaceutical calculations that play a crucial role in guiding educating students on dose calculations: learning how to accurately calculate doses based on factors such as patient weight, age, and condition.		
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method



students in the hall							
written and oral exams, and discussions with students in the hall	theoretical lectures and electronic lectures in classroom	Isotonic solutions.	Knowledge about Isotonic solutions.				7
written, and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Isotonic solutions.	Knowledge about Isotonic solutions.	Y			8
written and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Isotonic solutions.	Knowledge about Isotonic solutions.	Y			9
written and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Electrolyte solutions (milliequivalents, millimoles and milliosmoles).	Knowledge about Electrolyte solutions (milliequivalents, millimoles and milliosmoles).	Y			10
written and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Electrolyte solutions (milliequivalents, millimoles and milliosmoles).	Knowledge about Electrolyte solutions (milliequivalents, millimoles and milliosmoles).	Y			11







## Course Description Form

1. Course Name: Biopharmaceutics	
2. Course Code:	
3. Semester / Year: first \ fourth stage	
4. Description Preparation Date: 22 \ 2 \ 2023	
5. Available Attendance Forms: theoretical lectures and electronic lectures on class room	
6. Number of Credit Hours (Total) / Number of Units (Total) : 3 • theoretical hours + 3 • practical hours / 6 theoretical + 3 practical	
7. Course administrator's name (mention all, if more than one name) Name and Email: Asst. Lect. Haider abd alhasan hamodi dr\ \ hay@gmail.com	
8. Course Objectives	
The study of the physical properties, chemical effects, and final form of a pharmaceutical product, as well as the impact of drug administration methods on therapeutic behavior, includes the drug metabolism pathways in the human body, drug distribution in the body, drug bioavailability, the importance of drug components on absorption, and methods to enhance therapeutic behavior at the whole-body level by improving absorption or administration	
9. Teaching and Learning Strategies	
Presenting the necessary research and studies in the field of pharmacology and educating students about the physical and chemical properties of drugs, as well as drug metabolism pathways, through conducting discussion	
Strategy	



sessions among students to discuss all the information related to the drug and how to improve it and administer it.

1. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	knowledge of biopharmaceutics	Introduction to biopharmaceutics	lectures and electronic lectures in class room	sudden quiz, written and oral exams, and discussions with students in the hall
2	1	knowledge about drug absorption; mechanisms of absorption; physicochemical factors;	Biopharmaceutics aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients; type dosage forms.	theoretical lectures and electronic lectures in class room	sudden quiz, written and oral exams, and discussions with students in the hall
3	1	knowledge about drug absorption; mechanisms of absorption; physicochemical factors;	Biopharmaceutics aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients; type dosage forms.	theoretical lectures and electronic lectures in class room	sudden quiz, written and oral exams, and discussions with students in the hall
4	1	knowledge about drug absorption; mechanisms of absorption; physicochemical factors;	Biopharmaceutics aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients; type dosage forms.	theoretical lectures and electronic lectures in class room	sudden quiz, written and oral exams, and discussions with students in the hall
5	1	knowledge about drug absorption; mechanisms of absorption; physicochemical factors;	Biopharmaceutics aspects of products; drug absorption; mechanisms of absorption; physicochemical factors; dissolution rate; effects of excipients; type dosage forms.	theoretical lectures and electronic lectures in class room	sudden quiz, written and oral exams, and discussions with students in the hall



with students in the hall	physicochemical factors; dissolution rate; effects of excipients; type dosage forms.				
sudden quiz, written and oral exams, and discussions with students in the hall	One compartment open model.	One compartment open model.	One compartment open model.	0	Y
written and oral exams, and discussions with students in the hall	theoretical lectures and electronic lectures in classroom			1	Y
written and oral exams, and discussions with students in the hall	theoretical lectures and electronic lectures in classroom	Multi-compartment models.	Multi-compartment models.	1	Y
written, and oral exams, and discussions with students in the hall	theoretical lectures and electronic lectures in classroom	Pharmacokinetics of drug absorption	Pharmacokinetics of drug absorption	Y	Y
written and oral exams, and discussions with students in the hall	theoretical lectures and electronic lectures in classroom	Bioavailability and bioequivalence.	Bioavailability and bioequivalence	Y	Y
written and oral exams, and discussions with students in the hall	theoretical lectures and electronic lectures in classroom	Clearance of drug from the biological systems.	Clearance of drug from the biological systems.	Y	Y
written and oral exams, and discussions with students in the hall	theoretical lectures and electronic lectures in classroom	Hepatic	knowledge about	Y	Y



11. Course Evaluation		Mid term exam * marks	
oral exams, and discussions with students in	lectures and electronic lectures in classroom	elimination drugs.	Hepatic elimination drugs.
written and oral exams, and discussions with students in	theoretical lectures on electronic lectures in classroom	Protein binding drugs	knowledge about Protein binding of drugs
written and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Intravenous infusion	knowledge about Intravenous infusion
written and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Multiple dosage regimens.	Identify the Multiple dosage regimens.
written and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Non-linear pharmacokinetics	Identify the Non-linear pharmacokinetics.
written and oral exams, and discussions with students in	theoretical lectures and electronic lectures in classroom	Dosage adjustment in renal diseases	Identify the Dosage adjustment in renal diseases



Weekly quiz 1 • marks	
Final practical exam 1 • marks	
Final term exam 1 • marks	
<b>11. Learning and Teaching Resources</b>	
Required textbooks (curricular books, if any)	
Main references (sources)	Applied Biopharmaceutics & Pharmacokinetics, Seventh Edition by-Shargel-Leon-Shargel-Andrew-B.C.-Yu-Seventh-Edition.pdf) L, Wu-Pong S, Yu A: Statistics. 1 • 11
Recommended books and references	
(scientific journals, reports...)	
Electronic References, Websites	



### Course Description Form

1. Course Name: Pharmacognosy III			
2. Course Code:			
3. Semester / Year: second \ third stage			
4. Description Preparation Date: 1/11/2023			
5. Available Attendance Forms: theoretical lectures and electronic lectures on class room			
6. Number of Credit Hours (Total) / Number of Units (Total) : 3 * theoretical hours + 3 * practical hours / 3 theoretical + 3 practical			
7. Course administrator's name (mention all, if more than one name) Name and Email: pharmacist specialty \ ahmed adil abeed			
8. Course Objectives			
Course Objectives		include studying natural sources such as plants, animals, and minerals to discover and develop new drugs, understanding the chemical composition and biological activities of natural products, investigating traditional medicine practices, and ensuring the quality, safety, and efficacy of herbal and natural products used in healthcare.	
9. Teaching and Learning Strategies			
Strategy		performance of researchs and studies that are essential in Pharmacognosy field and play a crucial role in guiding and educating students about efficacy of herbal and natural products used in healthcare	
10. Course Structure			
Week	Hours	Required Learning	Unit or subject name
Learning	Evaluation		







alkaloids; imidazole alkaloids; and electronic lectures class room	students in discussions and written and oral exams, the hall	alkaloids; Steroidal alkaloids; lupinine alkaloids; alkaloidal amines; purine alkaloids.	and lectures class room	students in discussions and written and oral exams, the hall	knowledge about Alkaloids	Alkaloids: Steroidal alkaloids; lupinine alkaloids; alkaloidal amines; purine alkaloids.	theoretical lectures and electronic lectures classroom	written, and oral exams, discussions and lectures with students in	knowledge about Alkaloids	Alkaloids: Steroidal alkaloids; lupinine alkaloids; alkaloidal amines; purine alkaloids.	theoretical lectures and electronic lectures classroom	written and oral exams, discussions and lectures with students in	knowledge about Antibiotics	Antibiotics: Natural sources; biosynthetic pathways, isolation and purification.	theoretical lectures and electronic lectures classroom	written and oral exams, discussions and lectures with students in	knowledge about Antibiotics	Antibiotics: Natural sources; biosynthetic pathways, isolation and purification.	theoretical lectures and electronic lectures classroom	written and oral exams, discussions and lectures with students in	knowledge about Antibiotics	Antibiotics: Natural sources; biosynthetic pathways, isolation and purification.	theoretical lectures and electronic lectures classroom	written and oral exams, discussions and lectures with students in	knowledge about Antibiotics	Antibiotics: Natural sources; biosynthetic pathways, isolation and purification.	theoretical lectures and electronic lectures classroom	written and oral exams, discussions and lectures with students in
--	---	--	-------------------------------	---	------------------------------	--	---	--	------------------------------	--	---	---	--------------------------------	--	---	---	--------------------------------	--	---	---	--------------------------------	--	---	---	--------------------------------	--	---	---

V Identify the disease Kinetics rate and theoretical written, and







## Course Description Form

1. Course Name:

Principle of pharmacy practice

2. Course Code:

3. Semester / Year:

First/ first stage

4. Description Preparation Date:

22/2/2024

5. Available Attendance Forms:

Lecturers and educational courses

6. Number of Credit Hours (Total) / Number of Units (Total)

30 hours/2 credits

7. Course administrator's name (mention all, if more than one name)

Name: Abbas Khazaal okab

Email: abbaskhazaal@utq.edu.iq

*Abb*

8. Course Objectives

Course Objectives

Pharmaceutical calculations are the area of study that applies the basic principles of mathematics to the preparation , safe and effective use of pharmaceuticals.

9. Teaching and Learning Strategies

Strategy

Giving scientific lectures regularly and using all methods of clarification, including presentation tools Data such as data show, and also the use of the Internet for further clarification and communication with students



## 10. Course Structure

Week	Hours	Unit or subject name	Required Learning Outcomes	Learning method	Evaluation method
1-2	4	Get to know the basics of Pharmaceutical Calculation.	Knowing the pharmaceutical calculation and its role in pharmacy science	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall
3-4	4	Learn how to deal With medical Prescription	Study the most important basics in how to deal with recipes Medical by pharmacist	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall
5-6	4	Metric system	Knowledge of most Important international Systems Arithmetic used in world of pharmacy	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the Hall
7	2	Doses calculation	Learn about the most important methods and Procedure For Calculating the correct doses in the world of pharmacy	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall
8-10	4	Reducing and enlarging formulas	Learn how to prepare the pharmaceuticals formulas in required concentrations and how Solve problems if procedure if found	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall
11	2	Density in pharmacy	Learn about the concept of density in general and its applications in science of pharmacy	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall



12-13	4	Specific volume and specific gravity	The concept of Specific volume and Specific gravity and its application in pharmaceutical calculations	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall
14	2	Percent and concentration	Knowing the concept of percent in pharmacy and most important units used to express about concentration	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall
15	2	Calculation the Percentage and Strength	theoretical application of special laws in calculating strength and concentration For pharmaceut preparations	Theoretical lectures And e-learning	Written exam Daily exams Discussion in the hall

### 11. Course Evaluation

Mid term exam 25 marks  
Daily quizzes 5 marks  
Final written exam 70 marks

### 12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	
Main references (sources)	Pharmaceutical calculation by stoklosa
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	



## Course Description Form

Course Name:					
Dosage form design					
Course Code:					
Semester / Year:					
Second \ Fifth					
Description Preparation Date:					
10 \3 \ 2024					
Available Attendance Forms:					
theoretical lectures and electronic lectures on class room					
Number of Credit Hours (Total) / Number of Units (Total) :					
30 theoretical hours / 2 theoretical					
Course administrator's name (mention all, if more than one name)					
Name and Email:					
Dr. Hayder Abdulhasan Alhadad <a href="mailto:dr212hay@gmail.com">dr212hay@gmail.com</a>					
Course Objectives					
Course Objectives		-To provide knowledge about factors and principles of dosage forms of drugs. - To provide knowledge about applications of these principles in pharmaceutical industry.			
Teaching and Learning Strategies					
Strategy		performance of reports and studies that are essential in pharmaceutical field and play a crucial role in guiding and educating students about dosage forms, their properties, and their uses.			
Course Structure					
Week	Hours	Unit or subject name	Required Learning Outcomes	Learning method	Evaluation method
1	1	Pharmaceutical consideration: the need for dosage form.	Introduction about dosage forms	Theoretical lectures and electronic lectures on class room	sudden quiz, written and oral exams, and discussions
2	3	General consideration for the dosage form	Basic principles about pharmaceutical dosage forms	theoretical lectures and electronic lectures on class room	sudden quiz, written and oral exams, and discussions



3	2	Pre-formulation; physical description, microscopic examination.	Study of physical and microscopic properties of different dosage forms.	theoretical lectures and electronic lectures on class room	sudden quiz, written and oral exams, and discussions
4	2	Melting point; phase rule; particle size; polymorphism; solubility.	Study of some physicochemical properties of drugs.	theoretical lectures and electronic lectures on class room	sudden quiz, written and oral exams, and discussions
5	2	Permeability; PH; partition coefficient; Pka; stability; kinetics; shelf life.	Study of some chemical properties of drugs.	theoretical lectures and electronic lectures on class room	sudden quiz, written and oral exams, and discussions
6	2	Rate reaction; enhancing stability	Study rate of reactions including drug stability.	theoretical lectures and electronic lectures on classroom	Quizzes, written and oral exams, and discussions
7	2	Formulation consideration: excipients; definition and types; appearance; palatability; flavoring.	Study of formulation criteria	theoretical lectures and electronic lectures on classroom	Quizzes, written ,and oral exams, and discussions
8	2	Sweetening; coloring pharmaceuticals; preservatives; sterilization; preservatives selection.	Study of formulation criteria	theoretical lectures and electronic lectures on classroom	Quizzes, written and oral exams, and discussions
9	4	Biopharmaceutical considerations: principle of drug absorption; dissolution of the drug.	Study of kinetic criteria of drugs	theoretical lectures and electronic lectures on classroom	Quizzes, written and oral exams, and discussions
10	3	Bioavailability and bioequivalency; FDA requirements.	Study the effective drug concentrations in plasma and its dosage equivalents.	theoretical lectures and electronic lectures on classroom	Quizzes, written and oral exams, and discussions



11	3	Assessment of bioavailability; bioequivalence among drug products	Study the effective drug concentrations in plasma and its dosage equivalents.	theoretical lectures and electronic lectures on classroom	sudden quiz, written and oral exams, and discussions
12	4	Pharmacokinetic principles: half-life; clearance; dosage regimen consideration	Study of some kinetic parameters of drug in different dosage forms.	theoretical lectures and electronic lectures on classroom	sudden quiz, written and oral exams, and discussions

#### Course Evaluation

Mid-term exam 20 marks

Weekly quiz 10 marks

Final term exam 70 marks

#### Learning and Teaching Resources

Required textbooks (curricular books, if any)

Pharmaceutical dosage forms and drug delivery systems by Haward A. Ansel.

Main references (sources)

Recommended books and references (scientific journals, reports...)

Electronic References, Websites