Course Description Form

1. Course Name:
Industrial Pharmacy I (Theoretical+ Practical)
2. Course Code:
Phind23 4210--
3. Semester / Year:
2nd Semester/4th year
4. Description Preparation Date:
25/03/2024
5. Available Attendance Forms:
Students' signature on attendance sheet
6. Number of Credit Hours (Total) / Number of Units (Total)
3 hours Theoretical + 2 hours Practical(75) /4 units
7. Course administrator's name
Theoretical
Name: Dr. Thamer Abduljabbar Omar Email: thamer.omar@uomosul.edu.iq
Practical
Assist. Lec. Saad Mohammed Majeed Email: Saad.mohammed@uomosul.edu.iq Assist. Lec. Hayder Fouad Ibrahim Email: ph.hayderfouad89@uomosul.edu.iq Assist. Lec. Zahraa Hussein Ali Email: zahraa.2021@uomosul.edu.iq Assist. Lec. Shahad Myasar Nayyef Alfaris Email: shmn89@uomosul.edu.iq
8. Course Objectives

Course Objectives The course provides an introduction to the essential unit operations used in the manufacture of pharmaceutical products. Unit operations including blending, milling, drying, clarification and sterilization will be addressed.	Students learn to recognize how the output of one process is the input to the next process, and how deviations can cascade along the production sequence until they cause process failures. The course emphasizes design, scale-up, trouble-shooting, and optimization of pharmaceutical unit operations.

9. Teaching and Learning Strategies	
Strategy	Lecturing Homework Quiz Practical laboratory demonstrations, oral exam and practical tests

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method

1	3+2	Introduction to the pharmaceutical process Introduction in industrial pharmacy and pre-formulation	Principles of pharmaceutical processing	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	Principles and importance of fluid mixing in pharmaceutical manufacturing	Fluid mixing; Flow characteristics; mechanisms of mixing; mixing equipment	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Understanding the parameters that control solid mixing process	Solid mixing theory and particulate solid variables; forces and mechanisms	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Introduction into milling as a main pharmaceutical unit operation	Milling; pharmaceutical application; size measurement methods; theory and energy of comminution	Theoretical lectures. Laboratory demonstration.	Paper-based exams
5	3+2	Describing the main equipment; Discussing the main parameters that control this process	Types of mills; factors influencing milling; selection of mill techniques;	Theoretical lectures. Laboratory experiments.	Paper-based exams
6	3+2	Introduction into drying as a main pharmaceutical unit operation	Drying: definition purpose Psychrometry (humidity measurement)	Theoretical lectures. Laboratory demonstration.	Paper-based exams
7	3+2	Understanding the main theory of drying; Describing the main equipment; Discussing the main parameters that control this process	theory of drying drying of solids, classification of dryer specialized drying methods	Theoretical lectures. Laboratory demonstration.	Paper-based exams
8	**Mid-term exam**				
9	3+2	Introduction into clarification as a main pharmaceutical unit operation	Clarification and filtration: Theory filter media filter aids	Theoretical lectures. Laboratory demonstration.	Paper-based exams
10	3+2	Describing the main equipment; Discussing the main	filter selection sterile operations integrity testing	Theoretical lectures.	Paper-based exams

		parameters that control this process, addressing the essential needed tests for evaluating the filtration process.	equipments and systems (commercial and laboratory)	Laboratory demonstration.	
11	3+2	Introduction into sterilization as an important pharmaceutical unit operation	Sterilization; validation methods; microbial death kinetics	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Investigating the different sterilization methods	methods of sterilization (thermal and non-therma mechanisms; evaluation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	Comprehending the main properties and requirements of sterile products	Pharmaceutical dosage forms; sterile products	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Understanding the formulation requirements and quality control testing of sterile products	development; formulation; production; processing; quality control	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	**Course Review**				

11. Course Evaluation

- 20 M Theoretical assessment;
  (paper-based mid-term exam + quiz + attendance)
- 20 M practical assessment (attendance + quiz + practice+ reports)
- 60 M paper-based theoretical final exam

  _____
  100 M total

12. Learning and Teaching Resources

Required textbooks	Lachman L., Liberman H. and Kanig J.; The Theory and Practice of Industrial Pharmacy; Third Edition
Main references (sources)	Lachman L., Liberman L. and Schwartz J. Pharmaceutical Dosage Forms: Tablets; Second Edition : Volume I.
Electronic References, Websites	