

Course Description Form

1. Course Name:					
Pharmaceutical Calculations (Theoretical+ Practical)					
2. Course Code:					
Phind25 I210--					
3. Semester / Year:					
2 nd Semester/1 st year					
4. Description Preparation Date:					
15/01/2026					
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 /4 units					
7. Course administrator's name					
Theoretical					
Name: Assist. Lec. Mohmmmed Khalid Al-Shaheen					
Email: mohammed.khalid@uomosul.edu.iq					
Practical					
Name: Assist. Lec. Mais Salim Saadallah					
Email: drmais@uomosul.edu.iq					
8. Course Objectives					
Course Objectives					
Enable the students for preparing, dispensing reviewing and monitoring medication to ensure the s effective and affordable use of medication					
9. Teaching and Learning Strategies					
Strategy	Lecturing Seminars Homework Quiz Practical laboratory demonstrations, experimental calculations and Lab book catalogue				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3+2	Identify and describe the essential parts of a prescription Explain the legal and professional requirements of a valid prescription.	Interpretation of prescription or medication orders.	Theoretical lectures. Laboratory experiments	Paper-based exams
2	3+2	Define measurement systems and explain their importance in pharmaceutical practice. Compare these systems in terms of units and applications.	Systems of measurement	Theoretical lectures. Laboratory demonstration.	Paper-based exams
3	3+2	Define density as mass per unit volume. Define specific gravity and Relate specific gravity to density in practical applications.	Density, specific gravity	Theoretical lectures. Laboratory demonstration.	Paper-based exams
4	3+2	Define specific volume as the volume occupied by a unit mass of a substance.	specific volume	Theoretical lectures.	Paper-based exams

		<p>Calculate:</p> <ul style="list-style-type: none"> Density from mass and volume Specific gravity from density values Specific volume from density 		Laboratory demonstration.	
5	3+2	<p>Describe different ways of expressing concentration in liquid and solid dosage forms.</p> <p>Define and differentiate between:</p> <ul style="list-style-type: none"> Percentage weight in volume (% w/v) Percentage weight in weight (% w/w) Percentage volume in volume (% v/v) 	Percent strength, ratio strength, and other expressions of concentration	<p>Theoretical lectures.</p> <p>Laboratory experiments.</p>	Paper-based exams
6	3+2	<p>Define dose, dosage regimen, and dose interval.</p> <p>Perform dose calculations</p>	Calculation of doses	<p>Theoretical lectures.</p> <p>Laboratory demonstration.</p>	Paper-based exams
7	3+2	<p>Adjust doses according to patient-specific factors, including:</p> <ul style="list-style-type: none"> Body weight (mg/kg, g/kg) Body surface area (BSA) Age (pediatric and geriatric considerations) 	calculation of dose patient parameters	<p>Theoretical lectures.</p> <p>Laboratory demonstration.</p>	Paper-based exams
8	3+2	<p>Explain the importance of accurate formula adjustment in pharmaceutical compounding.</p> <p>Apply reducing and enlarging formula</p>	Reducing and enlarging formulas	<p>Theoretical lectures.</p> <p>Laboratory demonstration</p>	Paper-based exams
9	3+2	<p>Define altering product strength in pharmaceutical preparations.</p> <p>Describe the advantages of using stock solutions</p> <p>Define alligation</p>	Altering product strength, use of stock solutions, and problem solving by alligation	<p>Theoretical lectures.</p> <p>Laboratory demonstration.</p>	Paper-based exams
10	3+2	<p>Define isotonic solutions and explain their importance in pharmacy. Differentiate</p>	Isotonic solutions	Theoretical lectures.	Paper-based exams

		between isotonic, hypertonic, and hypotonic solutions.		Laboratory demonstration.	
11	3+2	Define buffer solutions and explain their role in resisting pH changes. Describe the importance of buffers in pharmaceutical formulations	buffer solutions	Theoretical lectures. Laboratory demonstration.	Paper-based exams
12	3+2	Define electrolytes and electrolyte solutions. Differentiate between strong and weak electrolytes. Define millimole and milliequivalents as a measure of amount of substance.	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	Theoretical lectures. Laboratory demonstration.	Paper-based exams
13	3+2	□ Calculate millimoles and milliequivalents from mass and molecular weight	Electrolyte solutions (milliequivalents, millimoles and milliosmoles)	Theoretical lectures. Laboratory demonstration.	Paper-based exams
14	3+2	Define parenteral dosage forms and explain their importance. Define intravenous infusion and distinguish between: <ul style="list-style-type: none"> • Continuous infusion • Intermittent infusion 	Intravenous infusions, parenteral, admixtures, rate-of-flow calculation	Theoretical lectures. Laboratory demonstration.	Paper-based exams
15	3+2	Define parenteral admixtures. Calculate flow rate in: <ul style="list-style-type: none"> • mL/hour (using infusion pumps) • Drops/minute (manual IV sets) 	Intravenous infusions, parenteral, admixtures, rate-of-flow calculation	Theoretical lectures. Laboratory demonstration.	Paper-based exams

11. Course Evaluation

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

100 M total

12. Learning and Teaching Resources	
Required textbooks	<ol style="list-style-type: none"> 1. Ansel HC, Stoklosa MJ. Pharmaceutical calculations 13th edition Philadelphia, PA: Lippincott. Williams and Wilkins, 2010 2. Laboratory Manual for Practical Pharmacology adopted by the department.
Main references (sources)	<ol style="list-style-type: none"> 1. Ansel HC, Stoklosa MJ. Pharmaceutical calculations ,10th , 13th edition Philadelphia, PA: Lippincott. Williams and Wilkins, 2010 2. Code of Ethics for Pharmacist. 3. American Pharmaceutical Association
Electronic References, Websites	https://www.pharmacist.com/