Syllabus: Practical Pharmaceutical Compounding and Calculation (#131701232)
Second Semester 2024 /2025

COURSE INFORMATION	
Course Name: Practical Pharmaceutical Compounding and Calculation **Learning method:** Blended learning **Semester:** Second **Department:** Pharmaceutics and Pharmaceutical Technology **Faculty:** Pharmaceutical Sciences	**Course Code:** 131701232 **Section:** As per semester **Core Curriculum**: 2019 Study Plan **JNQF Level:** 7
Day(s) and Time(s): According to HU courses timetable/semester **Classroom:** As per semester **Date prepared:** February 2022 **Date updated:** November 2024	**Credit Hours:** 1 **Prerequisites**: (131701231 أو ١٩١٧٠١١٢٣١) و ١١٠١٠٣١٠٨ م

COURSE DESCRIPTION

The pharmaceutical calculation and compounding lab focuses on a number of interests in the pharmaceutical fields, this includes: the fundamentals of calculations, compounding of solutions, suspensions, emulsions, semisolids, and suppositories preparations, in addition to build up students' information regarding preparations and dispensing.
This course aims to provide the students with good knowledge in calculations, formulation and extemporaneous dispensing, packaging, and storage of medicines. Specifically, solutions, suspensions, emulsions, creams, ointments and gels as well as suppositories are discussed along with their various types, additives, and methods of preparation, common examples, packaging and quality requirements.

DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion
- Students divided in groups acting in practical lab work
- Relevant films and documentaries

- Video lectures
- E-learning resources: e-reading assignments and practice quizzes through Model and Microsoft Team
- Student have to prepare and study Record discussion on moodle & team before lab time.
- In lab , Brief discussion well held to summarize the topics and discuss the procedure of experiment in details
- Discuss and explain the experimental results with each group.

FACULTY INFORMATION

Name	**1. Dr. Shorooq Abu-Khamees** **2. MSc. Mai Jaber**
Academic Title:	**1. Assistant Professor/ B** **2. Assistant lecturer**
Office Location:	**Third Floor**
Telephone Number:	
Email Address:	**shorooq@hu.edu.jo** **m.jaber@hu.edu.jo**
Office Hours:	**As announced per semester** ***Please send an e-mail (enaam@hu.edu.jo) to meet at any other time.***

REFERENCES AND LEARNING RESOURCES

Required Textbook(s):.

1. Applied Pharmaceutics in Contemporary Compounding, Robert Shrewsbury.
2. Pharmaceutical Compounding and Dispensing, John Marriott, Keith Wilson, Christopher Langley, and Dawn Belcher
3. Pharmaceutical Practice, A.J. Winfield, J.A. Rees and I.Smith. 4th edition, 2009. Published by Churchill Livingstone.
4. Pharmaceutical dosage forms and drug delivery systems, Ansel H.C., Popovich N.G., Allen L.V. 7th edition, 2000. Published by Williams and Wilkins.
5. Remington- The Science and Practice of Pharmacy, David Troy
6. Handbook of Pharmaceutical Excipients, Raymond Rowe
7. USP/ BP/Martindale: The Extra Pharmacopeia and http://pharmlabs.unc.edu

Useful Web Resources:

As per each lecture.

COURSE OBJECTIVES

By the end of this practical course the student will develop the following skills:

1. Gaining a sound base for all aspects of good pharmacy practice.
2. Managing a laboratory environment, including the correct use and selection of equipment and ingredients.
3. Interpret symbols, abbreviations, and terminology used in prescription writing.
4. Understand important physicochemical properties of the ingredients, as they relate to compounded preparations that are stable, safe, and efficacious.
5. Learning how to interpret a prescription and how to extemporaneously compound such a prescription product by putting knowledge into practice.
6. Knowledge in calculations, formulation and extemporaneous dispensing, packaging, and storage of medicines.
7. Make necessary calculations accurately and precisely.
8. Weigh and measures ingredients accurately, including selecting the most appropriate apparatus for weighing or measuring.
9. Through repetition, become competent with the fundamental skills of pharmacy compounding
10. Select appropriate auxiliary and cautionary labels to assure proper use and storage of preparations
11. Determine the appropriate information with which to counsel patients.

COURSE INTENDED LEARNING OUTCOMES (CILOs)

A. Foundational Knowledge

A.1 Acquire knowledge of all aspects of extemporaneous dispensing, including dosage forms, intended use, and physicochemical concepts (intermolecular forces, solubility, and properties of drug substances).

B. Essentials for Practice and Care

B.1 Apply knowledge of physical concepts and excipients in formulating extemporaneous formulations, predicting dosage forms, and identifying potential mistakes in prescriptions.

B.2 Examine given formulae to define the dosage form, perform calculations, and apply correct techniques.

C. Approach to Practice and Care

C.1 Select proper equipment, excipients, and manipulative techniques to compound formulations, correlating theoretical principles with laboratory skills.

D. Personal and Professional Development

D.1 Demonstrate teamwork, leadership, and time management skills while working collaboratively in group projects.

D.2 Communicate effectively with peers and tutors, both in written and oral formats.

D.3 Show responsibility, accountability, and integrity by complying with instructions, avoiding plagiarism, and adhering to university regulations.

D.4 Develop confidence and self-esteem through proactive engagement in learning, displaying commitment to personal and professional growth.

ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

Special Needs Section:

Tel: **00962-5-3903333 Extension: 4209**
Location: **Students Affairs Deanship/ Department of Student Welfare Services**
Email: **amalomoush@hu.edu.jo**
amalomoush@staff.hu.edu.jo

COURSE REGULATIONS

Participation

Excellent attendance is expected. According to the university policy, students who miss more than 15% of the lecture hours with or without excuse will be dismissed from the course. It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a lecture provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

On average, students need to spend 3 hrs of study and preparation weekly. At the beginning of the lectures, students should be on time and should not leave before the end of the lecture without an accepted excuse. **If the student missed a class, it is him/her responsibility to find out about any announcements or assignments they have missed.** For any clarification, students should communicate with their instructor at her posted office hours or by appointment. Students should listen well to the lecture, if anyone has a question, he/she should ask the instructor. Students can find the course material at the course Microsoft team/Model after the lecture.

Switch off your mobile or keep it silent throughout the lecture. Listen well to the lecture and avoid side discussions.

Sharing of course materials is forbidden. No course material including, but not limited to, course outline, lecture hand-outs, videos, exams, and assignments may be shared online or with anyone outside the class. Any suspected unauthorized sharing of materials, will be reported to the university's Legal Affairs Office. If a student violates this restriction, it could lead to student misconduct procedures.

Plagiarism

Plagiarism is considered a serious academic offence and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviours that compromise his/her own integrity as well as that of The Hashemite University.

Plagiarism includes the following examples, and it applies to all student assignments or submitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without using quotation marks.**

- **Misrepresentation of the sources that were used.**

The instructor has the right to fail the coursework or deduct marks where plagiarism is detected

Missed lab session

In case of expected and valid excuse and if space is available you will be expected to attend another lab session to complete assigned work (you must contact your instructor to arrange this within 24 hours of the missed session). If this is not possible, and you are given an excused absence, you will be expected to make up the work at an assigned time. For any clarification, please communicate your instructor at his posted office hours or by appointment.

If your excuse is not valid you will take zero evaluation in your missed lab (all related lab session work).

Missed Assessments

Assignments are due at the beginning of the class period on the date/time designated by the instructor.
Late course work is not accepted (e.g. projects, reports, papers…), unless otherwise indicated by the instructor. Work will only be accepted in an emergency situation.

In all cases of assessment, students who fails to attend an exam on the scheduled date without prior permission, and/or are unable to provide a medical note, will automatically receive a failure grade for this part of the assessment.

In cases where a student misses an assessment on account of a medical reason or with prior permission; in line with university regulations an incomplete grade for the specific assessment will be awarded and an alternative assessment or extension can be arranged.

Cheating

Cheating, academic disconduct, fabrication and plagiarism will not be tolerated, and the university policy will be applied. Cheating policy: The participation, the commitment of cheating will lead to applying all following penalties together:

- Failing the subject, he/she cheated at
- Failing the other subjects taken in the same course
- Not allowed to register for the next semester
- The summer semester is not considered as a semester

Student Complaints Policy

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment:

Course Assessment Plan						
Assessment	**Grade Weighting**	**Deadline Assessment**	**CILOs**			
			A	**B**	**C**	**D**
Quizzes	15%	Weekly	A	B	C	D
Reports	10%	Weekly	A	B	C	D
Product Quality Evaluation	5%	Weekly				
Lab Evaluation (lab performance, readiness, etc)	10%	weekly	A	B	C	D
Mid Exam (theoretical)	20%	To be announced	A	B	C	D
Final Exam (Practical)	15%	The 13th week	A	B	C	D
Final Exam (Theoretical)	25%	The 14th week	A	B	C	D

Description of Quizzes:
Quizzes will be given during the semester based upon the previous lectures.

Description of Reports:
Student reports that allow compiling, reviewing, and evaluating student work over time can provide a richer, deeper, and more accurate picture of what students have learned and are able to do than more traditional measures—such as standardized tests, quizzes, or final exams—that only measure what students know at a specific point in time.

Each reports should be submitted as a group report at the beginning of the same laboratory session.

Description of Product Quality Evaluation:
To be determined exactly based on the type of the product, for example product appearance, volume, homogeneity, sedimentation volume, color and/ or texture

Description of Lab Evaluation
Each student is evaluated weekly based on the following points:

A. Attendance punctuality (2 mark)
B. Behavior and adherence to basic lab requirements (e.g. Appearance: Lab-Coat, hair) (2 mark)
C. Availability of Foil, Gloves, Markers, & Cleaning tools (1 mark)

D. Balance & Machines Use & Tools Use & their Cleaning (2.5 mark)
E. Procedure: Preparation & Adherence & Time frame (2.5 mark)

Description of Practical Exams

Each student will prepare two pharmaceutical products that were previously learned during the semester.

Description of Theoretical Exams

Test questions will predominately come from material presented in the lectures and the lectures themselves. Semester exams may be conducted during the regularly scheduled lecture period. Exam may consist of a combination of multiple choice, short answer, match, true and false, and/or descriptive questions.

No make-up exams will be given. Only documented absences will be considered as per HU guidelines. Make-up exams may be different from regular exams in content and format.

Grades are not negotiable and are awarded according to the following criteria:

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75
A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00
D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-

WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

All lectures are delivered by blended learning.

Course Contents					
Week	**Credit Hours**	**ILOs**	**Topics**	**Teaching Procedure**	**Assessment methods**
1	1	A B	1. General Instructions and LaboratorySafety Rules 2. Key Formulation Skills: Appendix I: Weighing and Measuring Appendix II: Abbreviations commonly used within pharmacy	Lecture+ discussion Video presentations & Animation	– Class participation
2	3	A B,	Key Formulation Skills: Pharmaceutics principles and calculations.	Video presentations + Brief discussion	- Class participation - Laboratory Report - Quizzes - Lab work evaluation - Assignment
3	3	A B C D	Liquid dosage forms: solutions Aqueous solutions (1): Aromatic waterand ear drops ..etc (2) Syrups	Brief discussion + Video for laboratory work + Brain storming	- Class participation - Laboratory Report - Quizzes - Lab work evaluation - Assignment
4	3	A B C D	Liquid dosage forms: solutions Hydro–alcohol solutions: spirits, elixirs and tinctures ..etc	Brief discussion + Video for laboratory work + Brain storming	- Class participation - Laboratory Report - Quizzes - Lab work evaluation - Assignment
5	***Off week (first exam duration)***				
6	3	A B C D	Liquid dosage forms: Dispersed Systems Suspensions	Brief discussion + Video for laboratorywork + Brain storming	- Class participation - Laboratory Report - Quizzes - Lab work evaluation - Assignment
7	3	A B C D	Liquid dosage forms: Dispersed Systems Emulsions and Gels	Brief discussion + Video for laboratorywork + Brain storming	- Class participation - Laboratory Report Quizzes - Lab work evaluation - Assignment
8	***Off week (mid exam duration)***				
9		A B C D	Semisolids dosage forms: Dispersed Systems	Brief discussion + Video	- Class participation - Laboratory Report - Quizzes - Lab work evaluation

	3		Creams	for laboratory work + Brain storming	
10	3	A B C D	Semisolids dosage forms: Dispersed Systems Ointments and Pastes	Lecture+ discussion Video for laboratory work	- Class participation - Laboratory Report - Quizzes
11	3	A B C D	Solid Dosage forms: Suppositories	Lecture+ discussion Video for laboratory work	- Class participation - Laboratory Report - Quizzes - Lab work evaluation
13	***Practical final exam***				
14	***Theoretical final exam***				