Syllabus: Pharmaceutical statistics **(#**1917021241**)**

First Semester 2022 /2023

COURSE INFORMATION	
Course Name: Pharmaceutical Statistics **(Face to face) Semester: First** **Department: Clinical Pharmacy & Pharmacy Practice** **Faculty: Pharmaceutical Sciences**	**Course Code: 1917021241** **Section: per semester** **Core Curriculum**: **2013 Study Plan**
Day(s) and Time(s): per semester **Classroom: Pharmaceutical Sciences**	**Credit Hours:** 2 **Prerequisites**: 110108101

COURSE DESCRIPTION
Introduces students to the most important concepts in pharmaceutical statistics which help undergraduate students to acquire knowledges in different important topics with the purpose of improving the students'statistical knowledge to use the proper methods to collect the data, employ the correct analyses, and effectively present the results, as well as to make decisions based on data, and make predictions in different aspects of pharmaceutical researches. Topics include understanding types of data encountered in pharmaceutical studies and their appropriate graphical presentation, other statistical tools for describing central tendency and dispersion of data; probability concepts; statistical hypothesis testing and its application to group comparisons; and epidemiology concepts.

DELIVERY METHODS

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

- PowerPoint lectures and active classroom-based discussion
- Collaborative learning through small groups acting in an interdisciplinary context.
- Relevant films and documentaries
- Video lectures
- E-learning resources: e-reading assignments and practice quizzes through Model and MicrosoftTeam
- Workshops, and brain storming .

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

- PowerPoint lectures and active classroom-based discussion
  Students will be encouraged to participate and be actively involved in the learning process.Lectures will start with questions to inquire about the students' prior knowledge of the topic. Thesequestions will also be repeated at the end of the lecture to gain insight into the students' competences (to verify whether students have understood the topic). During delivering the lecture presentation, time will be given to allow students to reflect about what they have learnt and thinkin and discuss some examples of short case studies.

FACULTY INFORMATION

Name	**Dr. Muna Oqal**
Academic Title:	**Assistant Professor**
Office Location:	**Faculty of Pharmaceutical Sciences, 3rd floor, office number: 3438**
Telephone Number:	**Extension: 3438**
Email Address:	**munak@hu.edu.jo**
Office Hours:	**Per semester** ***Please send an e-mail (munak@hu.edu.jo) to meet at any other time.***

REFERENCES AND LEARNING RESOURCES

1 **(textbook)**	Biostatistics: a foundation for analysis in the health sciences, 10th edition, 2013, Wayne Daniel, 2013, John Wiley and sons.
2 **(textbook)**	Essential Statistics for the Pharmaceutical Sciences, Second Edition, 2015,Philip Rowe , 2016 John Wiley & Sons.
3 **(Textbook)**	Probability, Random Variables, Statistics, and Random Processes, 1st edition, 2020, Ali Grami JohnWiley & Sons, Inc.

STUDENT LEARNING OUTCOMES MATRIX

Course Objectives

The students are expected to:

1. Understanding types of data, and appropriate statistical tools for their analysis
2. Choose and create effective graphical, tabular, and numerical summaries of data
3. Understanding and using probability distributions.
4. Using statistics to judge on scientific data, experiments, and hypothesis.
5. Understanding the notion of sampling variability and sampling distributions.
6. To calculate and interpret confidence intervals and p-values and understand their limitations.
7. Selecting and carrying out an appropriate method of analysis to compare the means or proporti two or more populations and provide an interpretation of the results of such ananalysis.

Intended Learning Outcomes

A. Foundational Knowledge:

A1. Understand the Kinds of statistical studies and presentation of data.

A2. Understand the concept of sampling distributions and their use in hypothesis testing

A3. Understand the Central Limit Theorem and its use in sampling distributions

B. Essentials for Practice and Care

B1. Analyse the statistical data based on experimental design.

B2. Differentiate between data derived from samples or populations and their effect on th method of analysis.

B3. Choose an appropriate statistical technique of evaluation of data and significance of it content.

C. Approach to Practice and Care
C1. Show the effective presentation of data.
C2. Communicate the results of data analysis

D. Personal and Professional Development

D1. Collaborate with small group team members to solve problems

D2. Establish the basic required knowledge in the field of pharmaceutical statistics

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 theirability 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'sneeds.

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
Class participation and attendance are important elements of every student's learning experience at The Hashemite University, and the student is expected to attend all classes. A student should not miss more than 15% of the classes during a semester. *Those exceeding this limit of 15% will receive a failing grade regardless of their performance*. It is a student's responsibility to monitorthe 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 class provided that the number of such occasions does not exceed the limit allowedby 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 15 hrs of study and preparation weekly. At the beginning of thelectures, be on time and don't leave before the end of the lecture without an accepted excuse. **If youmissed a class, it is your responsibility to find out about any announcements or assignments you have missed.** For any clarification, please communicate your instructor at her posted office hours or by appointment. Listen well to the lecture, if you have a question, ask your instructor. Youwill find the course material at the course team

after the lecture.

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 studentmisconduct 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 behaviors 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

Late or Missed Assignments

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

- Submitting a term paper on time is a key part of the assessment process. Students who fail tosubmit their work by the deadline specified will automatically receive a 10% penalty. Assignments handed in more than 24 hours late will receive a further 10% penalty. Each subsequent 24 hours will result in a further 10% penalty.
- 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 assessmentwill be awarded and an alternative assessment or extension can be arranged.

Missed Assessments

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 misconduct, fabrication and plagiarism will not be tolerated, and the universitypolicy will be applied. Cheating policy: The participation, the commitment of cheating will lead toapplying 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 mayrefer to the students' handbook.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment and their final grade will be calculated from the forms of assessment as listed below with their grade weighting taken into account. The criteria for grading are listed at the end of the syllabus

Students will be graded through the following means of assessment:

Course Assessment Plan						
Assessment	**Grade Weighting**	**Deadline Assessment**	**CILOs**			
			A	**B**	**C**	**D**
First Exam	30%	~ 6th week	A	B	C	D
Second Exam	30%	~ 10th week	A	B	C	D
Final Exam	40%	~ 15th /16th week	A	B	C	D

Description of Exams

Test questions will predominately come from material presented in the lectures. Semester examswill be conducted during the regularly scheduled lecture period. Exam will consist of acombination of multiple choice, short answer, match, true and false and/or descriptive questions. **Homework:** Will be given for each chapter, while the chapter in progress you are supposed towork on them continuously and submit in next lecture when I finish the chapter.

You are also expected to work on in-chapter examples, self-tests and representative number of end of chapter problems. The answers of self-tests and end of chapter exercises are given at the end of the book.

Quizzes: Unannounced quizzes will be given during or/and at the end of each chapter based upon the previous lectures. It will enforce that you come prepared to the class.

No make-up exams, homework or quizzes will be given. Only documented absences will be considered as per HU guidelines.

Description of 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

"Lecture hours and weeks are approximate and may change as needed"

Note: For Chem 101 sections with 2 lecture periods per week (S/T, M/W or T/R), one lecture period covers 1. lecture hours (60 minutes). The course content specifies the sections in chapters 1-10 of the textbook thatwill be included in quizzes, homework and exams.

"Lecture hours and weeks are approximate and may change as needed"

Note: For the 2 lecture periods per week (S/T, M/W), one lecture period covers 1lecture hours (60minutes). The course content specifies chapters of the textbook that will be included in exams.

Introduction	Introduction to statistics, Basic concepts ofstatistics	**Week 1**	**1 lecture**	Active Classroom-Discussions	**CILOs**	-

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Topic 1	Graphical presentation of data	**Week 1/**	**1 lecture**	PowerPoint Lectures Active Classroom-Based Discussions Practical Case Scenarios	A	Exams Quizzes
Topic 2	Descriptive statistics: Indicators of central tendency	**Week2/3/**	**2 lectures**	PowerPoint Lectures Active Classroom-Based Discussions Practical Case Scenarios	A, B, C, D	Exams Quizzes
Topic 3	Descriptive statistics: Indicators of dispersions & positions	**Week 3/4**	**2 lectures**	PowerPoint Lectures Active Classroom-Based Discussions Practical Case Scenarios	A, B, C, D	Exams Quizzes
Topic 4	Introduction to probability	**Week 5**	**1 lecture**	PowerPoint Lectures Active Classroom-	A, B, C, D	Exams Quizzes

				Based Discussions Practical Case Scenarios		
Topic 5	Probability distributions (Binomial, Poisson, Normal, Standard)	**Week 5/6**	**1 lectures s)**	PowerPoint Lectures Active Classroom-Based Discussions Practical Case Scenarios	A, B, C, D	Exams
Topic 6	Sampling distributionof the sample meanand the Central LimitTheorem	**Week 6/7**	**2 lectures**	Active Classroom-Based Discussions Practical Case Scenarios an Problem-Based Calculation	A, B, C,	Exams
Topic 7	Estimating a Single Population Mean: Point Estimate and Confidence Interval	**Week 8**	**2 lectures**	Active Classroom-Based Discussions Practical Case Scenarios an Problem-Based Calculation	C, D	-
Topic 8	Estimating a Single	**Week 9**	**2 lectures**	Active Classroom-	A, B, C, D	-

	Population Mean: The t-distribution			Discussions		
Topic 9	Estimating The Difference betweenTwo Population Means (z, t and t'distributions)	**Week 10**	**3.lectures**	PowerPoint Lectures Active Classroom-Based Discussions Practical Case Scenarios	A, B, C, D	Exams Quizzes
Topic 10	Hypothesis Testing: Introduction	**Week 11**	**1 lectures**	PowerPoint Lectures Active Classroom-Based Discussions Practical Case Scenarios	A	Exams Quizzes
Topic 11	Hypothesis Testing:A Single Population Mean	**Week 12**	**2 lectures**	PowerPoint Lectures Active Classroom-Based Discussion Practical Case Scenarios	A, B, C,	Exams Quizzes

Topic 12	Hypothesis Testing:The Difference Between Two Population Means, Paired test	**Week 13**	**2 lectures**	PowerPoint Lectures Active Classroom-Based Discussions	A, B, C,	Exams Quizzes
				Practical Case Scenarios		
Topic 13	Epidemiology	**Week 14**	**2 lectures**	PowerPoint Lectures Active Classroom-Based Discussions Practical Case Scenarios	A, B, C,	Exams
University Exams	Revision	**Week 15**				