



<b>Faculty: Pharmacy</b>	
<b>Department: Clinical Pharmacy</b>	<b>Program: Bachelor</b>
<b>Semester: 2<sup>nd</sup></b>	<b>Academic year: 2022/2023</b>

## Course Plan

### First: Course Information

<b>Course Name: Mathematics and pharmaceutical statistics</b>		<b>Course Number: 1101102.</b>	<b>Credit Hours: 3</b>
<b>Prerequisite: None</b>		<b>Class Number: 1</b>	<b>Lecture Time: 10:00 – 11:00 am, (Sun, Mon, Tue).</b>
<b>Course Nature:</b>	<input checked="" type="checkbox"/> <b>Mandatory Faculty Requirement</b> <input type="checkbox"/> <b>Optional University Requirement</b> <input type="checkbox"/> <b>Mandatory University Requirement</b> <input type="checkbox"/> <b>Faculty Requirement</b> <input type="checkbox"/> <b>Ancillary Course</b> <input type="checkbox"/> <b>Optional Specialty Requirement</b> <input type="checkbox"/> <b>Mandatory Specialization requirement</b>		
<b>Type of Education:</b>	<input checked="" type="checkbox"/> <b>Fully Direct (Fully Face-to-Face Education)</b> <input type="checkbox"/> <b>Integrated Education (2 Face-to-Face + 1 Asynchronous)</b> <input type="checkbox"/> <b>Electronic Education Fully (1 Asynchronous + 2 Synchronous)</b>		

### Second: Instructor's Information

<b>Name: Mohammad Abu Assab</b>		<b>Academic Rank: Assistant Professor</b>	
<b>Office Number: 219 D</b>		<b>Phone Number: 1550</b>	<b>Email: mabuassab@zu.edu.jo</b>
<b>Office Hours:</b>	<b>Sun, Tue, Thu 11-12 am, 2-3 pm</b>		

### Third: Short Description of the Course

This course aims to familiarize students with the fundamental concepts of statistics, which is useful in the fields of health and medical sciences. This course represents an introduction to the field and provides a survey of data and data types. Specific topics include tools for describing central tendency and variability in data; methods for performing inference on population means and proportions via sample data; statistical hypothesis testing and its application to group comparisons; issues of power and sample size in study designs; and random sample and other study types. While there are some formulae and computational elements to the course, the emphasis is on interpretation and concepts.

## Fourth: Learning Outcomes

<i>Level descriptor according to (JNQF)</i>	<i>CILOs Code</i>	<i>CILOs</i> If any CLO will not be assessed in the course, mark NA.	<i>Associated PILOs Code</i> Choose one PILO for each CILO*	<i>Assessment method</i> Choose at least two methods	<i>Scores out of 100</i> State the total score identified for each CILO	<i>Minimum acceptable Score/percentage (%)</i> <i>The percentage should not be less than 50% **</i>
<b>Knowledge</b>	<b>K1</b>	To know health sciences' relevant statistical analyses and their goals.	<b>PK1</b>	Mid-exam Assignments Final exam	23 1 21	22.5 (50%)
	<b>K2</b>	To integrate health sciences statistical analyses knowledge in evaluating scientific literature and recent advances and explaining various phenomena.		Mid-exam Assignments Final exam	0 2 3	2.5 (50%)
<b>Skills</b>	<b>S1</b>	To identify problems, collect, summarize, interpret information, describe them, explore and prioritize potential strategies, and design, implement, and evaluate solutions.	<b>PS1</b>	Mid-exam Final exam Assignments	2 4 2	4 (50%)
	<b>S2</b>	To apply descriptive and Inferential statistical methods and tools.	<b>PS2</b>	Mid-exam Final exam Assignments	8 14 4	13 (50%)
	<b>S3</b>	NA	<b>NA</b>	NA	NA	NA
	<b>S4</b>	To use statistical tools in analyzing problems.	<b>PS3</b>	Mid-exam Final exam Assignments	2 3 1	3 (50%)
<b>Competencies</b>	<b>C1</b>	Able to make decisions based on statistical analysis.	<b>P. C3</b>	Mid-exam Final exam Assignments	0 4 4	4 (50%)

	<b>C2</b>	NA	<b>NA</b>	NA	NA	NA
	<b>C3</b>	Able to interpret and communicate the statistical results.	<b>P. C1</b>	Mid-exam Final exam Assignments	0 1 1	1 (50%)
	<b>C4</b>	NA	<b>NA</b>	NA	NA	NA
	<b>C5</b>	NA	<b>NA</b>	NA	NA	NA

\*For each CILO, the PILO could be the same or different

\*\*80% of the students must achieve the minimum acceptable percentage or higher for each CILO

## Fifth: Learning Source

<b>Designated Book:</b>	Biostatistics: A foundation for Analysis in the Health Sciences. 11th ed.	
<b>Author:</b> Daniel, W. W.	<b>Print:</b> John Wiley & Sons.	<b>Year:</b> 2014
<b>Additional Sources Website:</b>	Dawn Hawkins, Bio measurement, A Student's Guide to Biological Statistics, 3rd edition, Oxford University Press; 2014	
<b>Teaching Type:</b>	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> Laboratory <input type="checkbox"/> Workshop <input checked="" type="checkbox"/> MS Teams                   Moodle <input checked="" type="checkbox"/>	

## Sixth: Course Structure

Lecture Date	Learning Outcome (Covered CILOs)	Topics	*Learning Procedures	***Teaching Methods	***References
Sun 5/3/2023	-----	Introduction and Review syllabus	Direct	Lecture	outline
Tue 7/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Understanding biostatistics	Direct	Lecture	Text B 1-8
Thu 9/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Basic concepts	Direct	Lecture	Text B 9-17
Sun 12/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Descriptive Statistics: Graphical presentation of data	Direct	Lecture	Text B 19-30
Tue 14/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Descriptive Statistics: Numerical presentation of data	Direct	Lecture	Text B 33-37
Thu 16/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Central tendency measures	Direct	Lecture	Text B 38-41
Sun 19/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Central tendency measures	Direct	Lecture	Text B 42-44
Tue 21/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Dispersion measures	Direct	Lecture	Text B 45-50
Thu 23/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Dispersion measures	Direct	Lecture	Text B 51-60
Sun 26/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Probability concepts	Direct	Lecture	Text B 65-75
Tue 28/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Probability distributions:	Direct	Lecture	Text B 92-96

Thu 30/3/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	The Normal Distribution	Direct	Reading/HW	Text B 116-120
Sun 2/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Normal Distribution applications	Direct	Lecture	Text B 121-130
Tue 4/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Sampling distribution of the mean	Direct	Lecture	Text B 134-140
Thu 6/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Sampling distribution of the proportion	Direct	Lecture	Text B 150-155
Sun 9/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Estimation concepts	Direct	Lecture	Text B 160-163
Tue 11/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Point estimation	Direct	Lecture	Text B 164-166
Thu 13/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Interval estimation of the mean	Direct	Lecture	Text B 166-168
Sun 16/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Interval estimation of the mean	Direct	Lecture	Text B 166-168
Tue 18/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Interval estimation of the mean applications	Direct	Lecture	Text B 169-171
Thu 20/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	t- distribution	Direct	Lecture	Text B 172-175
Sun 23/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Interval estimation of proportion	Direct	Lecture	Text B 185-187
Tue 25/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Sample size determination for the mean	Direct	Lecture	Text B 189-191
Thu 27/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Sample size determination for the proportion	Direct	Lecture	Text B 192-193
Sun 30/4/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Hypothesis testing	Direct	Lecture	Text B 214-219
Tue 2/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Types of errors	Direct	Lecture	Text B 220-221
Thu 4/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Hypothesis testing for the mean	Direct	Lecture	Text B 222-230
Sun 7/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Critical value approach	Direct	Lecture	Text B 231-237
Tue 9/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	P value approach	Direct	Lecture	Text B 238-244

Thu 11/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Relation with Confidence interval	Direct	Lecture	Text B 245-253
Sun 14/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Hypothesis testing for proportion	Direct	Lecture	Text B 257-260
Tue 16/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	ANOVA concepts	Direct	Lecture	Text B 304-310
Thu 18/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	ANOVA Applications	Direct	Lecture	Text B 311-320
Sun 21/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Correlation and simple linear regression	Direct	Lecture	Text B 413-421
Tue 23/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Correlation and simple linear regression	Direct	Lecture	Text B 422-430
Thu 25/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Correlation and simple linear regression	Direct	Lecture	Text B 445-455
Sun 28/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Correlation and simple linear regression	Direct	Lecture	Text B 456-462
Tue 30/5/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Applications of correlation and regression	Direct	Lecture	Text B 463-467
Thu 1/6/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Chi-Square Distribution	Direct	Lecture	Text B 600-610
Sun 4/6/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Chi-Square Applications	Direct	Lecture	Text B 610-622
Tue 6/6/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Vital statistics	Direct	Lecture	Text B 749-754
Thu 8/6/2023	K1,2,3 S1, 2, 4 C1, 3, 4, 5	Applications	Direct	Lecture	Text B 755-760
Sun 11/6/2023		Final Exams			

Education procedures: (Direct, synchronous, asynchronous). \* \* Teaching methods: Lecture, video.....). \* \* Reference: Pages of the book, recorded lecture, video....)

## Seventh: Assessment methods

Methods	Fully Electronic Education	Integrated Teaching	Direct Teaching	Specific Course Output to be measured												
				*State the score identified for each CILO for each method of assessment out of 100 **If any CILO will not be assessed in the course, mark NA.												
				K1	K2	K3	S1	S2	S3	S4	C1	C2	C3	C4	C5	
First Exam																
Second Exam																
Mid-Exam				23	0	NA	2	8	NA	2	0	NA	0	NA	NA	
Participation/ Assignments				1	2	NA	2	4	NA	1	4	NA	1	NA	NA	
Asynchronous Meetings																
Final Exam				21	3	NA	4	14	NA	3	4	NA	1	NA	NA	
Total out of 100				45	5	NA	8	26	NA	6	8	NA	2	NA	NA	

## **Eighth: Course Policies**


- Meeting the deadline for the lecture.
- Commitment to interaction and participation.
- Interactive lectures will be given through a platform (MS Teams).
- Duties and tests will be given through a platform (Moodle).
- Commitment to the right appearance in front of the camera with the proper background.
- University regulations for attendance and absence from lectures and examinations are in force.
- Academic Integrity: Fraud or moral impersonation are unacceptable and are punishable according to university regulations and instructions.

<b>Approval</b>	<b>Name</b>	<b>Date</b>	<b>Signature</b>
<b>Head of Department</b>			
<b>Faculty Dean</b>			



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Approval	Name	Date	Signature
Head of Department	Dr. Hamza Alhamad	01-03-2023	
Faculty Dean	Dr. Ahlam Z. Al-Kilani	01-03-2023	