

Philadelphia University	 <b>PHILADELPHIA UNIVERSITY</b> <small>THE WAY TO THE FUTURE</small>	Approval date: 8/10/2024
Faculty of Science		Issue:
Dept. of Scientific B. Sci.		Credit hours: 3
Academic year 2024/2025		<b>Course Syllabus</b>

### Course information

Course#	Course title	Prerequisite
216121	Introduction to Probability & Statistics	None
<b>Course type</b>		<b>Class time</b>
<input type="checkbox"/> University Requirement	<input checked="" type="checkbox"/> Faculty Requirement	SM
<input type="checkbox"/> Major Requirement	<input type="checkbox"/> Elective <input checked="" type="checkbox"/> Compulsory	09:45 – 11:00
<b>Degree / NQF Level</b>	<input checked="" type="checkbox"/> Diploma degree (6)	<input type="checkbox"/> Bachelor degree (7)
		<b>Room #</b>
		21004

### Instructor Information

Name	Office No.	Phone No.	Office Hours	E-mail
Feras Awad	822	2132	SSMT 11:30-12:30	<a href="mailto:fawad@philadelphia.edu.jo">fawad@philadelphia.edu.jo</a>

### Course Delivery Method

Course Delivery Method			
<input checked="" type="checkbox"/> Physical	<input type="checkbox"/> Online	<input type="checkbox"/> Blended	
Learning Model			
Precentage	Synchronous	Asynchronous	Physical
	0%	0%	100%

### Course Description

In this course, students will explore graphical and numerical methods to describe data distributions and relationships, and learn how to design surveys and experiments that yield representative data. The course also introduces probability concepts, enabling students to draw conclusions about populations based on random samples, while understanding the reliability of these conclusions. Emphasis is placed on real-world applications of statistics rather than theoretical details.

### Course Learning Outcomes

Number	Outcomes	Corresponding Program outcomes
<b>Knowledge</b>		
<b>K1</b>	Students will develop an understanding of basic statistical ideas, present data using simple graphs and numbers, and apply probability concepts to make conclusions from data.	<b>K<sub>p</sub>1</b>
<b>Skills</b>		
<b>S1</b>	Students will develop the ability to use various techniques to concisely describe data and effectively apply probability concepts, utilizing basic tools for working with probabilities in practical situations.	<b>S<sub>p</sub>2</b>
<b>Competencies</b>		
<b>C1</b>	Work effectively in teams to solve statistical problems, analyze data, and present findings clearly and concisely.	<b>C<sub>p</sub>2</b>

## Learning Resources

<b>Course textbook</b>	William Mendenhall; Robert J. Beaver; Barbara M. Beaver. (2018) Introduction to Probability and Statistics. (15 <sup>th</sup> ed.). Cengage.
<b>Supporting References</b>	<ul style="list-style-type: none"> <li>• Lecture Notes given in Moodle by Dr. Heba Ayyoub</li> <li>• Robert V. Hogg; Elliot Tanis; Dale Zimmerman. (2021) Probability and Statistical Inference. (10<sup>th</sup> ed.). Pearson.</li> </ul>
<b>Supporting websites</b>	<ul style="list-style-type: none"> <li>• Student Companion Website: <a href="#">Click here</a>.</li> <li>• Google Sheets: <a href="https://sheets.new/">https://sheets.new/</a></li> <li>• GeoGebra: <a href="https://www.geogebra.org/">https://www.geogebra.org/</a></li> </ul>
<b>Teaching Environment</b>	<input checked="" type="checkbox"/> Classroom <input type="checkbox"/> laboratory <input type="checkbox"/> Learning platform <input type="checkbox"/> Other

## Meetings and Subjects Timetable

Week	Topic	Learning Methods	Tasks	Learning Material
1	Explanation of the study plan for the course, and what is expected to be accomplished by the students, and some technology preliminaries on Moodle and Microsoft Teams. <b>Introduction What Is Statistics?</b> The Population and the Sample Descriptive and Inferential Statistics	Lecture		Course Syllabus
2	<b>Describing Data with Graphs</b> 1.1 Variables and Data	Lecture		Chapter 1
3	1.2 Graphs for Categorical Data	Lecture		Chapter 1
4	1.3 Graphs for Quantitative Data 1.4 Relative Frequency Histograms	Lecture		Chapter 1
5	<b>Describing Data with Numerical Measures</b> 2.1 Measures of Center 2.2 Measures of Variability	Lecture	Quiz 1	Chapter 2
6	2.3 Understanding and Interpreting the Standard Deviation	Lecture		Chapter 2
7	2.4 Measures of Relative Standing	Lecture		Chapter 2
8	<b>Describing Bivariate Data</b> 3.1 Describing Bivariate Categorical Data	Lecture	Midterm	Chapter 3
9	3.2 Describing Bivariate Quantitative Data	Lecture		Chapter 3
10	<b>Probability</b> 4.1 Events and the Sample Space 4.2 Calculating Probabilities Using Simple Events	Lecture		Chapter 4
11	4.3 Useful Counting Rules	Lecture		Chapter 4
12	4.4 Rules for Calculating Probabilities	Lecture	Quiz 2	Chapter 4
13	<b>Discrete Probability Distributions</b> 5.1 Discrete Random Variables and Their Probability Distributions 5.2 The Binomial Probability Distribution	Lecture		Chapter 5
14	<b>The Normal Probability Distribution</b> 6.1 Probability Distributions for Continuous Random Variables	Lecture		Chapter 6
15	6.2 The Normal Probability Distribution	Lecture	Quiz 3	Chapter 6
16	Final Exam			

\* Includes: Lecture, flipped Class, project- based learning, problem solving based learning, collaborative learning

## Self-Review Exercises and Problem-solving from the Textbook

Chapter	Section	Exercises
1	1	1 – 22
	2	1, 4, 5, 12 – 15
	3	1, 3 – 5, 13, 16
	4	1, 2, 3 – 8, 9 – 12, 13 – 16, 17 – 20
2	1	1, 3, 5, 8, 11 – 12
	2	2, 3, 12
	3	1, 2, 6 – 11
	4	1, 2, 5, 6, 8, 9, 10, 12 – 15
3	1	1, 3, 9
	2	1 – 3, 4 – 7, 8 – 10, 14 – 18
4	1	1 – 6, 7 – 12, 16 – 20, 21 – 24, 27
	2	1 – 6, 11 – 15, 16, 19, 23, 27
	3	1, 3, 4, 5 – 8, 9 – 12, 13, 14, 15
	4	1 – 6, 7 – 10, 11 – 13, 14, 15, 16, 17, 21
5	1	1, 2 – 11, 12 – 16, 17 – 21
	2	1, 2 – 6, 7 – 10, 11 – 15, 25
6	1	1 – 4, 9 – 12, 19
	2	1, 2, 11, 12, 13, 15, 17, 19, 21, 22, 25 – 28, 29 – 35, 36 – 43, 44, 45

### Course Contributing to Learner Skill Development

Using Technology
<ul style="list-style-type: none"> <li>Use interactive visualization tools, such as GeoGebra, to help students describe statistical data and calculate measures like the mean.</li> </ul>
Communication Skills
<ul style="list-style-type: none"> <li>Encourage students to engage in peer discussions, group work, and online forums to exchange ideas, collaborate, and articulate mathematical solutions effectively.</li> </ul>
Application of Concepts Learnt
<ul style="list-style-type: none"> <li>Assign problem-solving projects that require students to apply statistical and probability concepts to new problems and scenarios, fostering their problem-solving and critical thinking skills.</li> </ul>

### Assessment Methods and Grade Distribution

Assessment Methods	Grade Weight	Assessment Time (Week No.)	Link to Course Outcomes
Mid Term Exam	30%	8	K1
Various Assessments *	30%	Continuous	S1, C1
Final Exam	40%	16	K1
<b>Total</b>	<b>100%</b>		

\* Includes: quiz, in class and out of class assignment, presentations, reports, videotaped assignment, group or individual projects.

## Alignment of Course Outcomes with Learning and Assessment Methods

Number	Learning Outcomes	Learning Methods*	Assessment Method
<b>Knowledge</b>			
<b>K1</b>	Students will develop an understanding of basic statistical ideas, present data using simple graphs and numbers, and apply probability concepts to make conclusions from data.	Lecture	<b>Exam</b>
<b>Skills</b>			
<b>S1</b>	Students will develop the ability to use various techniques to concisely describe data and effectively apply probability concepts, utilizing basic tools for working with probabilities in practical situations.	Lecture	<b>Quiz</b>
<b>Competencies</b>			
<b>C1</b>	Work effectively in teams to solve statistical problems, analyze data, and present findings clearly and concisely.	Case study	<b>Homework</b>

\* Includes: Lecture, flipped Class, project- based learning, problem solving based learning, collaborative learning

\*\* Includes: quiz, in class and out of class assignment, presentations, reports, videotaped assignment, group or individual projects.

## Course Polices

Policy	Policy Requirements
<b>Passing Grade</b>	The minimum passing grade for the course is (50%) and the minimum final mark recorded on transcript is (35%).
<b>Missing Exams</b>	<ul style="list-style-type: none"> <li>Missing an exam without a valid excuse will result in a zero grade to be assigned to the exam or assessment.</li> <li>A Student who misses an exam or scheduled assessment, for a legitimate reason, must submit an official written excuse within a week from an exam or assessment due date.</li> <li>A student who has an excuse for missing a final exam should submit the excuse to the dean within three days of the missed exam date.</li> </ul>
<b>Attendance</b>	The student is not allowed to be absent more than (15%) of the total hours prescribed for the course, which equates to six lectures days (M, W) and seven lectures (S, T, T). If the student misses more than (15%) of the total hours prescribed for the course without a satisfactory excuse accepted by the dean of the faculty, s/he will be prohibited from taking the final exam and the grade in that course is considered (zero), but if the absence is due to illness or a compulsive excuse accepted by the dean of the college, then withdrawal grade will be recorded.
<b>Academic Honesty</b>	Philadelphia University pays special attention to the issue of academic integrity, and the penalties stipulated in the university's instructions are applied to those who are proven to have committed an act that violates academic integrity, such as: cheating, plagiarism (academic theft), collusion, and violating intellectual property rights.

## Program Learning Outcomes to be Assessed in this Course

Number	Learning Outcome	Course Title	Assessment Method	Target Performance level
<b>Sp2</b>	The ability to apply mathematics in various real-life situations.	Introduction to Prob. & Statistics	Quiz	100% of the students get 80% or more on the rubric

## Description of Program Learning Outcome Assessment Method

Number	Detailed Description of Assessment
Sp2	Students will be given a real-life dataset to analyze and describe graphically, summarize it numerically with measures like the mean and standard deviation, and calculate relevant probabilities.

### Assessment Rubric of the Program Learning Outcome

	Excellent (3 points)	Good (2 points)	Poor (1 point)
Graphical Description of Data	Graphs are clear, appropriate, and accurately represent the data.	Graphs are included but lack clarity or accuracy.	Graphs are missing or inappropriate.
Numerical Summary (Mean, SD)	All calculations are correct and appropriately interpreted.	Calculations are mostly correct but may contain minor errors.	Incorrect or incomplete calculations.
Probability Calculations	All probabilities are correct and properly applied to the dataset.	Probabilities are mostly correct, with minor errors.	Probabilities are incorrect or missing.
Clarity and Presentation	Well-organized, clear, and concise presentation of findings.	Presentation is clear but could be more organized.	Poorly organized, unclear presentation.