

**FACULTY OF SCIENCE
DEPARTMENT OF BASIC SCIENCES & MATHEMATICS
COURSE SYLLABUS**



جامعة فيلادلفيا
Philadelphia University

Module Name : **Biostatistics**
Module Number : **210235**
Module Level : **1**
Credit Hours : **2 credit hours**
Prerequisite : **No Requisite or Co requisite**

Lecturer : **Mr. Feras Awad Mahmoud**
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Coordinator : **Dr. Ja'far Al-Mosawi**

Office Hours : **Sunday 12:10_{PM} – 01:00_{PM}**
Monday 08:15_{AM} – 09:45_{AM}
Tuesday 11:10_{AM} – 12:00_{PM} and 02:10_{PM} – 03:00_{PM}
Wednesday 12:45_{PM} – 02:15_{PM}
Thursday 02:10_{PM} – 03:00_{PM}

Module Purposes :

This course provides a practical introduction to statistical methods used in a variety of disciplines, such as health sciences, pharmacology, and nursing. All concepts introduced in the course are illustrated with examples that demonstrate principles.

Teaching Methods:

Duration: 16 weeks in first semester, 32 hours in total.

Lectures: 32 hours in total, 2 per week (including two 1-hour midterm exams).

Learning Outcomes: On completing this module, student should

- ❖ **Calculate, display, and interpret rates and proportions used in studies of health and disease.**
- ❖ **Organize and present data using tables, graphs, and summary statistics.**
- ❖ **Use probability as a tool for addressing random variation and statistical relations (the normal and t distributions, in particular).**
- ❖ **Calculate and interpret confidence intervals for means.**
- ❖ **Understand the conceptual basis of significance testing.**
- ❖ **Calculate and interpret statistical tests for means.**
- ❖ **Determine sample size requirements for the above types of confidence intervals and tests.**

Contribution to Program Learning Outcomes:

Knowledge and understanding, intellectual skills, practical skills, Transferable Skills,etc.

Module Outline:

WEEK	DAYS		SUBJECTS
	FROM	TO	
1	07/10/2007	11/10/2007	<p>CH01 : Introduction</p> <ul style="list-style-type: none"> ■ Statistics. Descriptive Statistics. Inferential Statistics: Population and Sample Variable. Observation and Data Set. Quantitative Variable: Discrete and Continuous Variables. Nominal, Ordinal, Interval and Ratio Test of Measurement. Summation Notation. <p>CH02 : Organizing Data</p> <ul style="list-style-type: none"> ■ Raw Data. Frequency Distribution for Qualitative Data. Relative Frequency of Category. Percentage. Bar Graph. Pie Chart.
2	14/10/2007	18/10/2007	<ul style="list-style-type: none"> ■ (Holiday of Eid Al Fetr from 13/10/2007 to 16/10/2007).
3	21/10/2007	25/10/2007	<ul style="list-style-type: none"> ■ Frequency Distribution for Quantitative Data. Class Limit, Class Boundaries, Class Marks and Class Width. Single - Valued Classes. Histograms. ■ Cumulative Frequency Distributions. Cumulative Relative Frequency Distributions. Ogives. Steam - Leaf Displays.
4	28/10/2007	01/11/2007	<p>CH03 : Descriptive Measures</p> <ul style="list-style-type: none"> ■ Measures of Central Tendency. Mean, Median and Mode for Ungrouped Data. Measures of Dispersion. Range, Variance and Standard Deviation for Ungrouped Data. ■ Measures of Central Tendency and Dispersion for Grouped Data. Chebyshev's Theorem. Empirical Rule.
5	04/11/2007	08/11/2007	<ul style="list-style-type: none"> ■ Coefficient of Variation. Z Scores. Measures of Position: Percentiles, Deciles and Quartiles. Interquartile Range. Box - and - Whisker Plot. <p>CH04 : Probability</p> <ul style="list-style-type: none"> ■ Experiment, Outcomes and Sample Space. Tree Diagrams and the Counting Rule. Events, Simple Events, and Compound Events.
6	11/11/2007	15/11/2007	<ul style="list-style-type: none"> ■ Probability. Classical, Relative Frequency and Subjective Probability Definitions. ■ Permutations and Combinations.
7	18/11/2007	22/11/2007	<ul style="list-style-type: none"> ■ Complementary Events. Multiplication Rule for the Intersection of Events. Addition Rule for the Union of Events. ■ (First Exam Will Be Held in this Week).
8	25/11/2007	29/11/2007	<ul style="list-style-type: none"> ■ Marginal and Conditional Probabilities. Mutually Exclusive Events. Dependent and Independent Events.
9	02/12/2007	06/12/2007	<p>CH05 : Discrete Random Variables</p> <ul style="list-style-type: none"> ■ Random Variable. Discrete Random Variables. Continuous Random Variables. Probability Distribution. Mean and Standard Deviation of Discrete Random Variable. ■ Binomial Random Variable. Binomial Probability Formula. Mean and Standard Deviation of Binomial Random Variable.
10	09/12/2007	13/12/2007	<p>CH06 : Continuous Random Variables</p> <ul style="list-style-type: none"> ■ Uniform Probability Distribution. Mean and Standard Deviation for the Uniform Probability Distribution. ■ Normal Probability Distribution. Standard Normal Distribution.
11	16/12/2007	20/12/2007	<ul style="list-style-type: none"> ■ Standardizing a Normal Distribution. Applications for the Normal Distribution. ■ Determining the z and x Values When an Area under the Normal Curve is Known.
12	23/12/2007	27/12/2007	<ul style="list-style-type: none"> ■ (Second Exam Will Be Held in this Week). ■ (Holiday of Eid Al Adha 20/12/2007 to 24/12/2007)
13	30/12/2007	03/01/2008	<p>CH07 : Sampling Distribution</p> <ul style="list-style-type: none"> ■ Simple Random Sampling. Systematic Random Sampling. Cluster Sampling. Stratified Sampling. Sampling Distribution of the Sampling Mean. Sampling Error. ■ Mean and Standard Deviation of the Sample Mean. Shape of the Sampling Distribution of the Sample Mean and the Central Limit Theorem. Applications of the Sampling Distribution of the Sample Mean.
14	06/01/2008	10/01/2008	<p>CH08 : Estimation and Sample Size Determination</p> <ul style="list-style-type: none"> ■ Point Estimate. Interval Estimate. Confidence Interval for the Population Mean: Large Samples. Maximum Error of Estimate for the Population Mean. The t - Distribution. ■ Confidence Interval for the Population Mean: Small Samples. Determining the Sample Size for the Estimation of the Population Mean.
15	13/01/2008	17/01/2008	<p>CH09 : Test of Hypothesis</p> <ul style="list-style-type: none"> ■ Null Hypothesis and Alternating Hypothesis. Test Statistic, Critical Values, Rejection and Acceptance Regions. Type I and Type II Errors. Hypothesis Tests about a Population Mean: Large Sample. ■ Calculating Type II Errors. P Values. Hypothesis Tests about a Population Mean: Small Samples.
16	20/01/2008	24/01/2008	<p>CH13 : Regression and Correlation</p> <ul style="list-style-type: none"> ■ Straight Lines. Linear Regression Model. Least Squares Line. Error Sum of Squares. ■ Standard Deviation of Errors. Total Sum of Squares. Regression Sum of Squares. Coefficient of Determination.
17	27/01/2008	06/02/2008	<ul style="list-style-type: none"> ■ (Final Exam Will Be Held in this Week).

Modes of Assessment:

MODES OF ASSESSMENT	SCORE	DATE
First Exam	25%	18/11/2007 – 22/11/2007
Second Exam	25%	16/12/2007 – 27/12/2007
Final Exam	50%	29/01/2008 – 06/02/2008

- ✚ *Make-up exams will be offered for valid reasons only with consent of the Dean.*
- ✚ *Make-up exams may be different from regular exams in content and format.*

Attendance Policy:

Lecture attendance is mandatory. Student is allowed maximally 15% absentia of the total module hours. More than this percentage, student with an excuse will be drawn from the module. Otherwise, student will be deprived from the module with zero mark assigned.

Expected Workload: On average you should expect to spend at least (9) hours per week on this module.

Text Books and Supporting Materials:

- ✚ **Introductory Biostatistics. Chap T. LE. Wiley 2003.**
- ✚ **Theory and Problems of Beginning Statistics. Larry Stephens. McGraw – Hill. 1998.**

References: Students will be expected to give the same attention to these references as given to the Module textbooks:

- ✚ **Fundamentals of Biostatistics. Bernard Rosner. 5th Edition. Duxbuty 2000.**
- ✚ **Biostatistics: A Foundation for Analysis in the Health Sciences. Wayne W. Daniel. Wiley.**

Handouts: In addition to the above, the student may provided by a handouts from the lecturer.

Website(s):

<http://ocw.mit.edu/OcwWeb/Mathematics/18-05Spring-2005/CourseHome/index.htm>