



Course Specifications

Course Title:	Biostatistics.
Course Code:	4012161-3
Program:	B.Sc. Microbiology Program.
Department:	Biology Department.
College:	Faculty of Applied Science.
Institution:	Umm Al-Qura University.
Revision Date	November 2019.

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A. Course Identification

1. Credit hours: 3 hours.
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
Level/year at which this course is offered: 2nd Year / Level 3.
4. Pre-requisites for this course (if any): NA.
5. Co-requisites for this course (if any): NA.

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	50
2	Blended	-	-
3	E-learning	-	-
4	Correspondence	-	-
5	Other	45	50

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	45
2	Laboratory/Studio	-
3	Tutorial	-
4	Practical/Field work/Internship	-
5	Others (specify) Office Hours.	28
	Total	73
Other Learning Hours*		
1	Study	45
2	Assignments	8
3	Library	15
4	Projects/Research Essays/Theses	10
5	Others (specify)	-
	Total	78

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

<p>1. Course Description</p> <p>The course will cover the principle of biostatistics, 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.</p>

2. Course Main Objective

Upon successful completion of this course, the student should:

1. Know and remember the basic concepts of statistics and probability such as displaying the data, central tendency, dispersion, coefficient of correlation, probability and types of random variables. Some probability distributions.
2. learn classification and description of the data.
3. Understand the meaning of correlation coefficient between two variables.
4. Carryout some simple statistical examinations manually and using SPSS program.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge:	
1.1	Organize and display the data as a simple/grouped frequency table according to its type Qualitative data.	
1.2	Be aware by the measures of central tendency and dispersion.	
1.3	Understand the basic concepts of Descriptive statistics and Some biological indices.	
1.4	Remember the equations used in both parametric and non-parametric tests such as F test, T test and Chi square test.	
1.5	Understand the statistical analysis of variables.	
2	Skills:	
2.1	Display and organize different types of data . Represent the data.	
2.2	Distinguish between the central tendency and dispersion Statistical measurements.	
2.3	Evaluate information.	
2.4	Calculate the measures of central tendency, dispersion and correlation.	
3	Competence:	
3.1	Use computers and internet.	
3.2	Interpret biostatistics data.	
3.3	Present biochemical data.	
3.4	Know how to write a report.	
3.5	Search on the internet.	
3.6	Design a professional presentation.	

C. Course Content

Topics to be Covered		
Topic	No of Weeks	Contact hours
❖ Introduction: Introduction to Biostatistics (Importance and targets).	1	3
❖ Descriptive Statistics Data as a simple/grouped frequency tables. Data presentation (frequency distribution) and box-plot.	2	6
❖ Data Presentation Different types bars and histograms. Data presentation by pie and graphs.	1	3
❖ Measures of central tendency Mean, medium and mode.	1	3

❖ Measures of dispersion. Range, variance, standard deviation and mean deviation.	2	6
❖ Mid-term exam & correcting homework	1	3
❖ Parametric tests ❖ F test ❖ ANOVA - One way analysis of variance, two way analysis of variance.	2	6
❖ T test T-test for single sample, two independent samples and t-test for paired samples.	1	3
❖ Non-parametric tests Chi Square test.	1	3
❖ Examples of Biological indices	1	3
❖ Use of MS Excel to present data	1	3
❖ Use of SPSS to perform and analyze data	1	3
❖ Final exam	1	3
Total	16 weeks	48hrs

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Organize and display the data as a simple/grouped frequency table according to its type Qualitative data.	<ol style="list-style-type: none"> Lectures. Home work. Statistical exercises. 	<ol style="list-style-type: none"> Short discussions. Short essay questions. Term activities. Home works. Final and midterm exam.
1.2	Be aware by the measures of central tendency and dispersion.		
1.3	Understand the basic concepts of Descriptive statistics and Some biological indices.		
1.4	Remember the equations used in both parametric and non-parametric tests such as F test, T test and Chi square test.		
1.5	Understand the statistical analysis of variables.		
2	Skills:		
2.1	Display and organize different types of data . Represent the data.	<ol style="list-style-type: none"> Lectures. Brain storming. Discussion. 	<ol style="list-style-type: none"> Exam must contain questions that can measure these skills. Quiz and exams. Discussions.
2.2	Distinguish between the central tendency and dispersion Statistical measurements.		
2.3	Evaluate information.		
2.4	Calculate the measures of central tendency, dispersion and correlation.		
3	Competence:		
3.1	Use computers and internet.		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.2	Interpret biostatistics data.	1. Homework (preparing a report on some topics related to the course depending on web sites). 2. Seminars presentation.	1- Evaluation of presentations. 2- Evaluation of reports.
3.3	Present biochemical data.		
3.4	Know how to write a report.		
3.5	Search on the internet.		
3.6	Design a professional presentation.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Periodical exam	6 th week	10 %
2	Mid-term exam	8 th week	20 %
3	Term paper report	All weeks	10 %
4	Discussion and interaction	All weeks	10 %
5	Homework	All weeks	10 %
6	Final exam	16 th week	40 %
Total			100%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice: **Two hours per week as office hours and can be arranged according to the student needs.**

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Chap T. LE. (2003). Introductory Biostatistics . John Wiley & Sons Publication.
Essential References Materials	Daniel, W.A. (1987). Biostatistics: A foundation for analysis in the health sciences . 4 th Ed. New York: Wiley.
Electronic Materials	http://jmasi.com/ehsa/index.htm
Other Learning Materials	Software program such as Excel and SPSS. PPT prepared by the course professor.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Class room is already provided with data show. The area of class room is suitable concerning the number of enrolled students and air conditioned.

Item	Resources
Technology Resources (AV, data show, Smart Board, software, etc.)	Digital lab containing 15 computers.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Student Feedback on Effectiveness of Teaching	The students.	Questionnaires. Open discussion in the class room at the end of the lectures.
Evaluation of Teaching	The Instructor or by the Department	Revision of student answer paper by another staff member. Analysis the grades of students.

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Professor Shady M. ElShehawy.
Reference No.	
Date	20.11.2019