Course Specifications

Course Title:	**Elements of Statistics and Probability**
Course Code:	**30112231-3**
Program:	**BSc. Mathematics 301100**
Department:	Mathematical Science
College:	Applied Sciences
Institution:	**Umm Al-Qura University**

Table of Contents

A. Course Identification

1. Credit hours: 3 credit hours
2. Course type **a.** University ☐ College ☐ Department ■ Others ☐ **b.** Required ■ Elective ☐
3. Level/year at which this course is offered: Third Level / Second Year
4. Pre-requisites for this course (if any)**:** Calculus I (30111101-4)
5. Co-requisites for this course (if any)**:** None.

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	45	100%
2	**Blended**	0	0%
3	**E-learning**	0	0%
4	**Correspondence**	0	0%
5	**Other**	0	0%

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	(3 hours) x (15 weeks)
2	**Laboratory/Studio**	0
3	**Tutorial**	(1 hour) x (15 weeks)
4	**Others** (specify)	0
	Total	60
Other Learning Hours*		
1	**Study**	(1 hour) x (15 weeks)
2	**Assignments**	(1 hour) x (15 weeks)
3	**Library**	(1 hour) x (15 weeks)
4	**Projects/Research Essays/Theses**	(1 hour) x (15 weeks)
5	**Others** (specify)	0
	Total	60

* 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

1. Course Description:

This course provides an elementary introduction to probability, statistical theory and methodology with applications. It contains the most basic tools for a good initiation to statistical methods. The course helps the students to establish an outstanding theoretical background for their future professions.

2. Course Main Objective:
Acquiring the basic knowledge and concepts of describing data statistically and elementary theory of probability.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge:**	
1.1	Define the concepts, principles and techniques in statistics and probability theory.	
1.2	Describe basic statistical methodology of data analysis including; graphs, descriptive statistics	
1.3	List the addition and the multiplication rules of probability.	
2	**Skills:**	
2.1	Develop connections within branches of statistics and between statistical analysis and other disciplines.	
2.2	Explain the counting rules.	
2.3	Estimate the population parameter by the statistic.	
2.4	Write the conditional probability rule and Bayes theorem.	
2.5	Diagram the sample space.	
2.6	Interpret the results of statistical problem and data analysis	
3	**Competence:**	
3.1	Work independently and with groups for solving statistical problem.	
3.3	Use computer skills and library effectively.	
3.4	Apply the statistical skills in solving the life problems.	

C. Course Content

No	List of Topics	Contact Hours
1	Definition and general view of statistics	3
2	Organization and presentation of statistical data.	3
3	Measures of central tendency (Mean, Median, Mode) of the simple data and the frequency distribution.	3
4	Measures of dispersion (The Range – The Variance and the standard deviation - Coefficient of variation) of the simple data and the frequency Distribution	6
5	Moments and Measure of Skewness and Kurtosis	6
6	Correlation measures	3
7	Simple Linear regression	3
8	Sample space and Events	6

	Counting Techniques (Fundamental basics, Addition Rule – Multi- plication Rule- Permutation and Combinations)	
9	Definition of the probability and its applications	6
10	Conditional probability - Independence of events and Bayes theorem and its applications	6
Total		45

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	Define the concepts, principles and techniques in statistics and probability theory.	Lectures Tutorials	Exams Homework.
1.2	Describe basic statistical methodology of data analysis including; graphs, descriptive statistics		
1.3	List the addition and the multiplication rules of probability.		
2.0	**Skills**		
2.1	Develop connections within branches of statistics and between statistical analysis and other disciplines.	Lectures, Individual or group work	Home work Reports Quizzes Discussion
2.2	Explain the counting rules.		
2.3	Estimate the population parameter by the statistic.		
2.4	Write the conditional probability rule and Bayes theorem.		
2.5	Diagram the sample space.		
2.6	Interpret the results of statistical problem and data analysis		
3.0	**Competence**		
3.1	Work independently and with groups	Lectures, Individual or group work	Exams Quizzes Homewo Discussion
3.2	Use the computer skills and library effectively.		
3.3	Apply the statistical skills in solving the life problems		
3.4	Work independently and with groups		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm Test (1)	6th week	20%
2	Midterm Test (2)	12th week	20%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
3	Homework and Quizzes	During the semester	10%
4	Final Examination	End of semester	50%

***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:

Each group of students is assigned to a faculty member where he or she will provide academic advising. All faculty members are required to be in their offices outside teaching hours. Each faculty member allocates at least 4 hours per week to give academic advice and to answer to the questions of students about concepts studied during the lectures.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Probability and statistics for engineers and scientists, Ronald E. Walpole, Prentice Hall (2012).
Essential References Materials	Elementary Statistics, A Step by Step Approach, Allan G. Bluman, McGraw Hill, 9th ed.
Electronic Materials	None.
Other Learning Materials	None.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Large classrooms that can accommodate more than 50 students.
Technology Resources (AV, data show, Smart Board, software, etc.)	Data Show.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	None.

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment.	Students	Direct
Quality of learning resources.	Students	Direct
Extent of achievement of course learning outcomes.	Faculty member	Direct

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	Council of the Mathematics Department
Reference No.	
Date	