VISION 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

اعتماد
NCAAA

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Course Specifications

Course Title:	Mathematical Statistics
Course Code:	30114303-3
Program:	BSc. Mathematics 301100
Department:	Department of Mathematics
College:	Al-Leith University College
Institution:	Umm Al-Qura University

Table of Contents

A. Course Identification

1. Credit hours: 3	
2. Course type	
a. University ☐ College ☐ Department ☑ Others ☐	
b. Required ☑ Elective ☐	
3. Level/year at which this course is offered: The seventh level	
4. Pre-requisites for this course (if any)**:** Probability Theory (30113302-3)	
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**	(3 hours) x (15 weeks)	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**	45 hours
2	**Laboratory/Studio**	0
3	**Tutorial**	0
4	**Others** (Exams & Quizzes)	8 hours
	Total	53 hours
Other Learning Hours*		
1	**Study**	70 hours
2	**Assignments**	15 hours
3	**Library**	-
4	**Projects/Research Essays/Theses**	-
5	**Others**	20 hours
	Total	105 hours

* 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
The course is interested in inferential statistics methods and how to use it to estimate the population parameters and how to use ANOVA table to perform statistical data analysis

2. Course Main Objective
At the completion of this course, Student are expected to know how to use mathematical models in estimating and testing statistical hypothesis concerning population parameters from sample statistics.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Define the related basic scientific facts, concepts, principles and techniques in mathematical statistics.	K1
1.2	Recognize the relevant theories and their applications in basic mathematics.	K2
1.3	Outline the logical thinking, the importance of counting methods in mathematical statistics.	K5
2	**Skills :**	
2.1	Develop statistical analysis skills.	S1
2.2	Estimate the population parameter by statistic.	S7
2.3	Apply statistical tools for hypothesis testing	S5
2.4	Discuss the results of mathematical statistics problems.	S2
2.5	Develop connections within branches of statistics and other disciplines.	S8
2.6	Solve problems using a range of formats and approaches in basic science.	S9
3	**Competence:**	
3.1	Use an appropriate statistical models.	C2
3.2	Illustrate the ability to work independently and within groups.	C1
3.3	Illustrate how to use the internet and software programs to deal with problems and to write reports about mathematical statistics.	C4
3.4	Apply statistical knowledge gained during the course using computer packages	C2
3.5	Comprehend the ethical standards	C3

C. Course Content

No	List of Topics	Contact Hours
1	Sampling distribution – Sampling distribution of the mean	3
2	Sampling distribution of the proportions and of the variance	3
3	Sampling distribution of the difference between the means of two independent samples – Important distributions of small samples with applications (the chi-square – T-Distribution – F-Distribution	6
4	Estimation of the population parameters- Point estimate – properties of point estimate - Mean squared error - properties of best estimate (Unbiasedness –Consistency – Sufficiency - Efficiency)	9
5	Method of estimation (Method of moments –Maximum likelihood method- Lest square method – Bayesian estimators). Interval estimate (mean- probation – variance).	9
6	Confidence intervals and hypothesis testing The property of un-biasedness Interpret a confidence interval and confidence level.	6
7	The P-value of a test statistic - One—way analysis of variance (ANOVA).	6

	Revision	3
Total		45

D. Teaching and Assessment

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

	CLOs	Teaching Strategies	Assessment Methods
1	**Knowledge:**		
1.1	Define the related basic scientific facts, concepts, principles and techniques in mathematical statistics.	Lectures Discussion Problem Solving	Exams Assignments Quizzes Exams
1.2	Recognize the relevant theories and their applications in basic mathematics.		
1.3	Outline the logical thinking, the importance of counting methods in mathematical statistics.		
2	**Skills :**		
2.1	Develop statistical analysis skills.	Lectures Discussion Problem Solving Brain Storming	Assignments. Reports. Quizzes. Discussion
2.2	Estimate the population parameter by statistic.		
2.3	Apply statistical tools for hypothesis testing		
2.4	Discuss the results of mathematical statistics problems.		
2.5	Develop connections within branches of statistics and other disciplines.		
2.6	Solve problems using a range of formats and approaches in basic science.		
3	**Competence:**		
3.1	Use an appropriate statistical models.	Lectures Brain storming Tasks to measure students' personal skills.	Assignments. Reports. Discussion
3.2	Illustrate the ability to work independently and within groups.		
3.3	Illustrate how to use the internet and software programs to deal with problems and to write reports about mathematical statistics.		
3.4	Apply statistical knowledge gained during the course using computer packages		
3.5	Comprehend the ethical standards		comprehend and observe ethical standards

2. Assessment Tasks for Students

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

#	Assessment task*	Week Due	Percentage of Total Assessment Score
3	Homework + reports + Quizzes	During the semester	10%
4	Final exam	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 :
1- There is a student advisor committee for the students.
2- The office hours for the staff is depicted on their office.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Brian Albright, Essentials of Mathematical Statistics (International Series in Mathematics), ISBN-13: 978-1-449-68534-8, 2014. D. D. Boos and L. A. Stefanski, Essential Statistical Inference Theory and Methods, ISBN-13: 978-1-449-68534-8, 2014.
Essential References Materials	R. J. Larsen and M. L. Marx, An introduction mathematical statistics and its applications, second edition, Prentice – Hall, Engle weed Cliffs, New Jersey, 1986. R. V. Hogg and A. T. Craig, Introduction to mathematical statistics, fifth edition, Prentice – Hall, Inc. A Simon & Schuster company, New Jersey, 1995. S. Ross, A first course in probability, third edition, Macmillan Publishing company, New York, 1988.
Electronic Materials	http://www.freetechbooks.com http://tutorial.math.lamar.edu/sitemap.aspx
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	-Classroom with capacity of 30-students. - Library
Technology Resources (AV, data show, Smart Board, software, etc.)	All classrooms are equipped by data show
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
Effectiveness of teaching and assessment	deanship of registration and acceptance	Student feedback through electronic survey
Quality of learning resources	Program Leaders	Student feedback through electronic survey
Evaluation of the teachers by internal & external faculty members	Program Leaders	Course Reports, evaluation of random grading report
Program Quality	Peer Reviewer	Peer evaluation and feedback

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, , 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	The mathematical sciences (college of applied sciences) and the mathematics (Al-Leith University College) department s first meeting of the coordinative committee
Reference No.	4101050782	First meeting
Date	Sunday, 17 November 2019	Thursday, 17 October 2019

Department Head

Dr. Ali Hassani