VISION 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA

Course Specifications

Course Title:	Probability and Statistics
Course Code:	MATH 220
Program:	Information and Computer Science
Department:	Computer Science and Information
College:	Science Az Al-Zulfi
Institution:	Majmaah 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: **4th** level
4. Pre-requisites for this course (if any)**:**   **MATH 120**
5. Co-requisites for this course (if any)**:**   **Nil**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	48	80%
2	Blended	6	10%
3	E-learning	6	10%
4	Correspondence	-	-
5	Other	-	-

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	
3	Tutorial	30
4	Others (specify)	
	Total	60
Other Learning Hours*		
1	Study	30
2	Assignments	30
3	Library	
4	Projects/Research Essays/Theses	10
5	Others (specify)	30
	Total	100

* 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

Discrete Probability Distributions, Continuous Probability Densities, Combinatorics, Conditional Probability, Random Variables, Joint Distribution: Expectation, Variance, Covariance, Correlation Coefficient, Law of Large Numbers, Central Limit Theorem, Generating Functions, Markov Chains, Random Walks.

Statistics: Towards Statistical, Thinking for Decision Making, Descriptive Sampling Data , Analysis, Probability for Statistical Inference and Modeling , Necessary Conditions for Statistical Decision Making, Estimators and Their Qualities, Hypothesis Testing: Rejecting a Claim, Hypotheses Testing for Means and Proportions, Tests for Statistical Equality of Two or More Populations, Applications of the Chi-square Statistic, Regression Modeling and Analysis, Index Numbers with Applications.

2. Course Main Objective

1. Learn how to collect data.
2. Present data using various graphical methods.
3. Calculate and interpret numerical summaries.
4. Use and apply laws of probability and learn how these laws are used in statistical inference.
5. Use the concepts of sampling distributions and learn how it applies in making statistical inferences be based on sample of data.
6. Be familiar with some important discrete and continuous distributions.
7. Make appropriate use of statistical inference.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Student's ability to write physical equations in a correct Statistical way.	K1
1.2	Enable students to analyses the Statistical problems.	K1
1.3	The students will explain and interpret a general knowledge of Probability.	K2
1.4	Be familiar with some important discrete and continuous distributions.	
2	**Skills :**	
2.1	Use and apply laws of probability and learn how these laws are used in statistical inference.	S1
2.2	Present data using various graphical methods	
2.3	Calculate and interpret numerical summaries	S2
2...	Be familiar with some important discrete and continuous distributions. Make appropriate use of statistical inference	
3	**Competence:**	
3.1	The student should illustrate how to Search the internet and using software programs to deal with problems.	C1
3.2	Learn how to collect data.	
3.3		

CLOs	Aligned PLOs
3...	

C. Course Content

No	List of Topics	Contact Hours
1	Introduction and Data collection, Types of Data and Their Sources, Types of Sampling Methods, Some important Definitions,	4
2	Presenting Data in Tables and Charts, Organizing Numerical Data, The Ordered Array and Stem-Leaf Display,	4
3	Numerical Descriptive Measures, Measures of Central Tendency, Quartiles, Measures of Variation, Shape, The Empirical Rule	4
4	Simple Linear Correlation and Regression, The Scatterplot,	4
5	Basic Probability, Sample spaces and events, Simple Probability	4
6	Joint Probability, Conditional Probability, Statistical independence, Marginal Probability, Counting Rules	8
7	some Important Discrete Probability Distributions, The Probability of a Discrete Random Variable, Binomial Distribution	8
8	The Normal Distribution, The Standardized Normal Distribution	8
9	Sampling Distributions, Sampling Distribution of the Mean, The Central Limit Theorem	8
10	Confidence Interval Estimation, Point Estimates, Interval Estimates, Confidence Interval Estimation forth Mean (Variance Known), Factors Affecting the Width of Confidence Interval, Determining Sample Size.	8
	Total	60

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	list, name, record, define, label, outline, state, describe, recall, memorize, reproduce, recognize, record, tell, write	Start each chapter by general idea and the benefit of it. Demonstrate the course information and principles through lectures.	Written Exam Homework assignments Class Activities Quizzes
1.2	reproduce, recognize, record, tell, write	Provide main ways to deal with the exercises.	
...			
2.0	**Skills**		
2.1	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop,	Encourage the student to look for some complicated problems in the different references.	Written Exam Homework assignments

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	create, prepare, reconstruct, reorganize, summarize, explain, predict,		Class Activities Quizzes
2.2	The students will estimate the population parameter by the statistic		
…	Student's ability to write the conditional probability rule and bayes theorem. Draw the tree diagram and prepare the sample space .	Homework assignments.	
3.0	**Competence**		
3.1	The student should illustrate how take up Ask the students to search Quizzes of some previous	The student should illustrate how take up Ask the students to search Quizzes of some previous	Written Exam Homework assignments Class Activities Quizzes
3.2	Must be shown the ability of working independently and with groups.	Teach them how to cover missed lectures. Give students tasks of duties	
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First written mid-term exam	6	15%
2	Second written mid-term exam	12	15%
3	Presentation, class activities, and group discussion	Every week	10%
4	Homework assignments	After each chapter	10%
5	Implementation of presented protocols	Every two weeks	10%
6	Final written exam	16	40%
7	Total		100%
8			

*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 :

Office hours: Sun: 8-10, Mon. 10-12

Email: m.badawi@mu.edu.sa

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Probability and Statistics for Engineers and Scientists" 9 edition, Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers and Keying E. Ye , Pearson , 2017
Essential References Materials	Introduction to Probability and Statistics, I. Scott MacKenzie , William Mendenhall , 2008.
Electronic Materials	Applied Statistics and Probability for Engineers", 5 edition , Douglas C. Montgomery and, George C., Wiley , March 2012.
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom and Labs as that available at college of science at AzZulfi are enough.
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	N/A

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Questionnaires (course evaluation) achieved by the students and it is electronically organized by the university.	Students	Indirect
Student-faculty management meetings.	Program Leaders	Direct
Discussion within the staff members teaching the course	Peer Reviewer	Direct
Departmental internal review of the course.	Peer Reviewer	Direct
Reviewing the final exam questions and a sample of the answers of the students by others.	Peer Reviewer	Direct
Visiting the other institutions that introduce the same course one time per semester.	Faculty	Indirect

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	
Reference No.	
Date	