





# **Course Specifications**

Course Title:	Probability and Statistics
Course Code:	MATH 220
Program:	Computer Science
Department:	Computer Science and Information
College:	Science Az Al-Zulfi
Institution:	Majmaah University



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# **A. Course Identification**

1. Credit hours: 3
2. Course type
<b>a.</b> University College Department $$ Others
<b>b.</b> Required Elective $$
3. Level/year at which this course is offered:
4 <sup>th</sup> 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	<b>Contact Hours</b>	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	
Contac	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.	a2
1.2	Enable students to analyses the Statistical problems.	a1
1.3	The students will explain and interpret a general knowledge of	a2
	Probability.	
1.4	Be familiar with some important discrete and continuous distributions.	a1
2	Skills :	
2.1	Use and apply laws of probability and learn how these laws are used in	b2
	statistical inference.	
2.2	Present data using various graphical methods	b2
2.3	Calculate and interpret numerical summaries	b2
2	Be familiar with some important discrete and continuous distributions.	b2
	Make appropriate use of statistical inference	
3	Competence:	
3.1	The student should illustrate how to Search the internet and using	C1
	software programs to deal with problems.	
3.2	Learn how to collect data.	C1
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,	3
1	Types of Sampling Methods, Some important Definitions,	5
2	Presenting Data in Tables and Charts, Organizing	3
Z	Numerical Data, The Ordered Array and Stem-Leaf Display,	5
3	Numerical Descriptive Measures, Measures of Central Tendency,	3
	Quartiles, Measures of Variation, Shape, The Empirical Rule	5
4	Simple Linear Correlation and Regression, The Scatterplot,	3
5		
	Total	

# **D.** Teaching and Assessment

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

Code	Course Learning Outcomes	<b>Teaching Strategies</b>	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
1.2	reproduce, recognize, record, tell, write	Provide main ways to deal with the exercises.	Quizzes
2.0	Skills		
2.1	estimate, explain, summarize, write, compare, contrast, diagram, subdivide, differentiate, criticize, calculate, analyze, compose, develop, create, prepare, reconstruct, reorganize, summarize, explain, predict,	Encourage the student to look for some complicated problems in the different references.	Written Exam Homework
2.2	The students will estimate the population parameter by the statistic		Class Activities
	Student's ability to write the conditional probability rule and bayes theorem. Draw the tree diagram and prepare the sample space .	Homework assignments.	Quizzes
3.0	Competence		
3.1	The student should illustrate how take	The student should illustrate	Written Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
	up Ask the students to search Quizzes of some previous	how take up Ask the students to search Quizzes of some previous	Homework assignments Class Activities
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	Quizzes

#### 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, 2011
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.
<b>Technology Resources</b> (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	<b>Evaluation Methods</b>
Questionnaires (course	Students	Indirect
evaluation) achieved by the		
students and it is		
electronically organized by		
the university.		
Student-faculty management	Program Leaders	Direct
meetings.		
Discussion within the staff	Peer Reviewer	Direct
members teaching the course		
Departmental internal review	Peer Reviewer	Direct
of the course.		
Reviewing the final exam	Peer Reviewer	Direct
questions and a sample of the		
answers of the students by		
others.		
Visiting the other institutions	Faculty	Indirect
that introduce the same course		
one time per semester.		

**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**

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Council / Committee	Dr. Maria Altaib
Reference No.	
Date	19/09/2019