Course Specification

(Bachelor)

Course Title:	Probability and Statistics
Course Code:	STAT 133
Program:	Computer Science/Information Technology
Department:	Information System
College:	College of Computer and Information Sciences
Institution:	Majmaah University
Version:	2
Last Revision Date:	31 May 2023

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: 3 (3, 0, 1)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☐Required		☐Elective		
3. Level/year at which this course is offered: (Level 2/Year 2.)					
4. Course general Description:					
Upon successful completion of this course, students will be familiar with basic rules of probability and will be able to use them in modeling uncertainty in obtaining and recording data. They will be able to utilize graphical and numerical summaries of data in understanding data generating processes. They will understand the logic of statistical inference and will be able to apply common inferential procedures. Students will be exposed to the computational aspects of statistics using calculators, spreadsheet programs or special purpose data analysis packages.					
5. Pre-requirements for this course (if any)**:**					
MH 113					
6. Pre-requirements for this course (if any)**: N/A**					
7. Course Main Objective(s):					
1) Understanding and applying probability rules, independent random events. **2) Understanding and applying random variables and their probability distribution.** **3) Understanding and applying common discrete probability distributions and their** **relationships.** **4) Understanding and applying common continuous probability distributions and their applications.**					

5) Understanding and applying sampling distribution of some sample statistics.
6) Understanding and applying principles of estimation, estimation of some population parameters.
7) Understanding and applying the principles of estimation of simple linear regressions.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	
3.	**Field**	
4.	**Tutorial**	15
5.	**Others (specify)**	
Total		60

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	CLO-2: Use random variables and their probability	**K1**	Classroom	Quiz, Midterm Exam, Assignment,

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	distribution			Final Exam
1.2	CLO-3: Use discrete probability distributions and their relationships	**K1**	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.3	CLO4: Use continuous probability distributions and their applications	**K1**	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.4	CLO-6: Understand the principles of estimation and estimation of population parameters	**K1**	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.5	CLO-7: Understand the principles of estimation of simple linear regressions	**K1**	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
2.0	**Skills**			
2.1	CLO-1: Apply probability rules and independent random events	**S1**	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
2.2	CLO5: Apply sampling distribution of sample statistics	**S5**	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
3.0	**Values, autonomy, and responsibility**			
3.1				
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to sample space, Random events, probability rules	5
2.	Conditional Probability, Bayes' Rule	4
3.	Random variables, Definitions of Discrete distribution, mean and variance of a random variable, Random variables,	4
4.	Definitions of continuous distribution, mean and variance of a random variable	4
5.	Mean of linear combination of independent random variables	4
6.	Variance of linear combination of independent random variables	4
7.	Discrete distributions (Binomial, Poisson)	4
8.	Continuous distributions (Uniform, Exponential)	4
9.	Continuous distributions (Normal)	5
10.	Sampling distributions of sample statistics: t-distribution	5
11.	The concept of estimation methods: Point estimation and Confidence interval estimation,	5
12.	The concept of estimation methods continued: Concepts of testing.	4
13.	Concepts of simple linear correlation	4
14	Linear regression	4
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quizzes	3, 13	20%
2.	Assignment	4, 9, 11, 14	20%
3.	Midterm	8	20%
4.	Final	16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	• Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers and Keying E. Ye, "Probability and Statistics for Engineers and Scientists", Pearson; 10 editions. • Douglas C. Montgomery and, George C. "Applied Statistics

	and Probability for Engineers", Wiley; 6th edition (2013).
Supportive References	Michael Baron, "Probability and statistics for computer engineers", CRC press, 2nd edition (2013)
Electronic Materials	https://oli.cmu.edu/courses/probability-statistics-open-free/ http://www.extension.harvard.edu/open-learning-initiative/sets-counting-probability
Other Learning Materials	Blackboard, Class notes

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classroom
Technology equipment (projector, smart board, software)	Smart Board, Projector
Other equipment (depending on the nature of the specialty)	Internet Connection

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect
Effectiveness of Students assessment	**Instructor**	**Direct**
Quality of learning resources	Instructor	**Direct**
The extent to which CLOs have been achieved	**Quality Team**	**Direct**
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	
REFERENCE NO.	
DATE	