هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	**Probability and Statistics**
Course Code:	**STAT 133**
Program:	**Computer Science/ Information Technology**
Department:	**Computer Science**
College:	**College of Computer and Information Science**
Institution:	**Majmaah University**

Table of Contents

A. Course Identification

1. Credit hours:	**3(3, 0, 1)**
2. Course type	
a.	University ☐ College ☑ Department ☐ Others ☐
b.	Required ☑ Elective ☐
3. Level/year at which this course is offered:	**Level 2/ Year 2**
4. Pre-requisites for this course (if any)**:**	**MH 113**
5. Co-requisites for this course (if any)**:**	**N/A**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	60	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course 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.

2. Course Main Objective

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.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	CLO-1: Apply probability rules and independent random events	
1.2	CLO-2: Use random variables and their probability distribution	
1.3	CLO-3: Use discrete probability distributions and their relationships	
1.4	CLO4: Use continuous probability distributions and their applications	
1.5	CLO5: Apply sampling distribution of sample statistics	
1.6	CLO-6: Understand the principles of estimation and estimation of population parameters	
1.7	CLO-7: Understand the principles of estimation of simple linear regressions	
2	**Skills :**	
2.1		
2.2		
2.3		
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to sample space, Random events, probability rules	3+1
2	Conditional Probability, Bayes' Rule	3+1
3	Random variables, Definitions of Discrete distribution, mean and variance of a random variable	3+1
4	Random variables, Definitions of continuous distribution, mean and variance of a random variable	3+1
5	Mean of linear combination of independent random variables	3+1
6	Variance of linear combination of independent random variables	3+1
7	Discrete distributions (Binomial, Poisson)	3+1
8	Continuous distributions (Uniform, Exponential, Normal)	3+1
9	Sampling distributions of sample statistics: t-distribution	3+1
10	The concept of estimation methods: Point estimation and Confidence interval estimation, The concept of estimation methods continued: Concepts of testing.	3+1
11	Concepts of simple linear correlation and linear regression	3+1
	Total	44

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 and Understanding**		
1.1	CLO-1: Apply probability rules and independent random events	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.2	CLO-2: Use random variables and their probability distribution	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.3	CLO-3: Use discrete probability distributions and their relationships	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.4	CLO4: Use continuous probability distributions and their applications	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.5	CLO5: Apply sampling distribution of sample statistics	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.6	CLO-6: Understand the principles of estimation and estimation of population parameters	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
1.7	CLO-7: Understand the principles of estimation of simple linear regressions	Classroom	Quiz, Midterm Exam, Assignment, Final Exam
2.0	**Skills**		
2.1			
2.2			
3.0	**Values**		
3.1			
3.2			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	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 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:
Every faculty will be assigned a number of students in the corresponding department for academic advising. Students can meet the faculty during advising hours or whenever the faculty is in the office during the specified office hours.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• 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).
Essential References Materials	• 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. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Smart Board, Projector
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Internet Connection

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Test/Quiz/Mid Term/ Final Exam assessment (Extent of achievement of course learning outcomes)	Instructure	Direct
Course Survey in the middle of the semester and at the end	Students	Indirect

Evaluation Areas/Issues	Evaluators	Evaluation Methods
of the semester (Effectiveness of teaching and assessment)		
Final Exam Answer Scripts Verification	Peer faculty members	Review (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	CS Council
Reference No.	45-1444/2
Date	2022