هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Probability and Statistics
Course Code:	202364-3
Program:	**Bachelor in Information Technology**
Department:	Department of Mathematics
College:	**College of Science**
Institution:	**Taif 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: 8/3
4. Pre-requisites for this course (if any)**:** Calculus (1) (202261-3)
5. Co-requisites for this course (if any)**: NON**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	5	100%
2	**Blended**	0	0
3	**E-learning**	0	0
4	**Distance learning**	0	0
5	**Other**	0	0

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	50
2	**Laboratory/Studio**	0
3	**Tutorial**	0
4	**Others** (specify)	0
	Total	50

B. Course Objectives and Learning Outcomes

1. Course Description

Statistical methods and the application of probability theory are essential to the understanding of data and underlying processes in many fields of sciences and engineering. This course introduces probability and statistics concepts with applications for students who would like to have careers in the Computer Science and Computer Engineering. Topics include: sample space, events, random variables, expectation and moments, combinatorial probability, conditional probability, discrete and continuous distributions, discrete and continuous probability density functions, functions of random variables, sampling distributions, introduction to stochastic processes, statistical inference, estimation and test of hypotheses

2. Course Main Objective

The course objectives are to expose the student to the basic concepts of probability and statistic distribution theories and their applications. The focus will be given on the understanding of the nature of randomness phenomena in the real world, the

	formulation of statistical methods by using intuitive arguments to enable the students to be able to make meaningful decisions.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Explain and the basic concepts of probabilities and describe sample spaces and events for random experiments with graphs tables lists or tree diagrams.	K1
1.2	Explain probability distribution functions and their properties	K1
1.3	Explain discrete and continuous random variables: cumulative distribution functions, probability mass function, probability density function.	K1
2	**Skills :**	
2.1	Apply conditional probability: Bay's rule, total probability and statistical independence.	S1
2.2	Calculate basic statistical concepts: Mean Variance and moment. Present some special statistical distribution for the discrete continuous case.	S1
3	**Values:**	

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to linear systems the method of elimination.	5
2	Matrices and Gaussian Elimination. {Definition of a matrix the coefficient matrix of a linear system the elementary row operations Row equivalent matrices	5
3	GaussJordan Elimination. {Reduced echelon matrix GaussJordan Elimination method}	5
4	Matrix operations {addition, multiplication by a number, and multiplication rules of matrix arithmetic}	5
5	Inverses of matrices {identity matrix definitions of invertible nonsingular matrix, inverse matrix, and noninvertible singular matrix arbitrary integral	5
6	Determinants {determinants of 2×2 matrices higher order determinants, definitions of minors, cofactors, and n×n determinants properties of determinants}	5
7	Determinants and elementary row operations.	5
8	Cramer's Rule and inverse matrices { Cramer's Rule the adjoint matrix finding the inverse of a matrix by determinant and the adjoint matrix}	5
9	Vectors in the plane and in space The Vector space R2	5
10	The Vector space R3	5
Total		50

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**		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.1	Understand and the basic concepts of probabilities and describe sample spaces and events for random experiments with graphs tables lists or tree diagrams.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.2	Understand probability distribution functions and their properties	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.3	Understand discrete and continuous random variables: cumulative distribution functions, probability mass function, probability density function.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
2.0	**Skills**		
2.1	Apply conditional probability: Bay's rule, total probability and statistical independence.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
2.2	Calculate basic statistical concepts: Mean Variance and moment. Present some special statistical distribution for the discrete continuous case.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
3.0	**Values**		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments	Continues	20%
2	Midterm Exam	6	30%
3	Final Exam	12	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 :

Academic advising and counseling of students is an important component of teaching; student academic advising is a mandatory requirement of College of Computers and Information Technology (CCIT). Appropriate student advising provides support needed for the student during times of difficulty. In addition, it helps the student to build a close relationship with his/her advisor and to provide student motivation and involvement with the institution.

In addition, since faculty are usually the first to recognize that a student is having difficulty, faculty members play a key role in developing solutions for the students or referring them to appropriate services. Faculty members also participate in the formal student-mentoring program.

Additional counseling is provided by course directors, who provide students with academic reinforcement and assistance and refer “at risk” students to the Vice Dean for Academic Affairs and the Vice Dean for female section.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Douglas C. Montgomery, George C. Runger, Applied Statistics and Probability for Engineers, 1990
Essential References Materials	NON.
Electronic Materials	NON
Other Learning Materials	NON

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• A Lecture room appropriate for maximum 25 students with a personal computer, a data show and a smart board. • A Lab room appropriate for maximum 15 students with a personal computer, a data show and a smart board.
Technology Resources (AV, data show, Smart Board, software, etc.)	• NON
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	Students	Students' surveys and Students course evaluation
Improvement of Teaching	Course Coordinator	deficiencies based on the student Evaluation, faculty input, course file, and program assessment
Verifying Standards of Student Achievement	Curriculum Committee	• Review CAF (Course assessment file) • Alumni surveys. Periodic exchange and remarking of tests or a sample

Evaluation Areas/Issues	Evaluators	Evaluation Methods
		of assignments with staff at another

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	IT Department Council/ Executive program committee
Reference No.	11
Date	23/10/21443