هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Probability and Statistics for Data Science
Course Code:	CS473
Program:	Computer Science
Department:	Computer Science
College:	College of Computer and Information Sciences
Institution:	Majmaah University

Table of Contents

A. Course Identification

1. Credit hours: **3 (2,2,0)**
2. Course type **a.** University ☐ College ☐ Department ☒ Others ☐ **b.** Required ☐ Elective ☒
3. Level/year at which this course is offered: Level 9
4. Pre-requisites for this course (if any)**:** **STAT102**
5. Co-requisites for this course (if any)**:**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	44	%100
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	22
2	**Laboratory/Studio**	22
3	**Tutorial**	
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course is designed for students who have no previous knowledge of data analytics but wish to acquire these skills in a short period of time. These studentswill learn how to analyze large data sets and identify patterns that will improve any company's and organization decision-making process

2. Course Main Objective

1. 1 To provide the conceptual knowledge data science.
2. To provide the important and useful from the data science perspective.
3. To develop the skills of applying the techniques & tools of statistical practice and empirical research.
4. To provide the knowledge and applications of software package (R- Language).

3. Course Learning Outcomes

	CLOs	AlignedPLOs
1	**Knowledge and Understanding**	
1.1	To explore and analyze the data. .	K1
1...		
2	**Skills :**	
2.1	To model projects (whether in data science or in research) with the statistical tool among predictors, and between predictors and a target variable.	S2
2.2	To apply the sampling techniques from the Big Data projects.	S4
2.3	To design an experiment for test of the hypothesis.	S2
2.4	To take the automated decision faced with a problem	S2
2.5	To apply the basic statistical techniques on data, using statistical software package (R).	S1
2...		
3	**Values:**	
3.1		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to Data Sciences and Overview of R	4
2	Exploratory Data Analysis	4
3	Probability Review and Continous Random Variables	4
4	Discrete Random Variables and Probability Distributions	4
5	Sampling Distributions	4
6	Confidence Interval / Hypothesis Testing	4
7	ANOVA	4
8	Correlation & Regression	4
9	Classification	4
10	Statistical Machine Learning	4
11	Unsupervised Learning	4
Total		44

D. Teaching and Assessment

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

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
1.0	**Knowledge and Understanding**		
1.1	To explore and analyze the data. .	Classroom Teaching	Assignment, Quiz, Mid Exam, Final Exam
1.2			
2.0	**Skills**		
2.1	To model projects (whether in data	Classroom Teaching	Quiz, Final Exam,

Code	Course Learning Outcomes	TeachingStrategies	AssessmentMethods
	science or in research) with the statistical tool among predictors, and between predictors and a target variable.		Lab Based exercises
2.2	To apply the sampling techniques from the Big Data projects.	Classroom Teaching	Assignment, Lab Exercises, Final Exam
2.3	To design an experiment for test of the hypothesis.	Classroom Teaching	Quiz, Mid Exam, Final Exam
2.4	To take the automated decision faced with a problem	Classroom Teaching	Quiz, Final Exam, Lab Based Exercises
2.5	To apply the basic statistical techniques on data, using statistical software package (R).	Classroom Teaching	Assignment, Lab Exercises, Final Exam
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	**4, 8**	10%
2	Mid Term Exam	**6**	20%
3	Assignment	**3, 5, 9**	10%
4	Lab Based Exercises	**Weekly**	20%
5	Final Exam	12	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 :

- Each student is allotted to an academic advisor for guidance and counselling
- Available for a minimum of 4 hours per week/course, as communicated to the students.
- Student also contacts through social networking websites / D2L/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Peter Bruce and Andrew Bruce, Practical Statistics for Data Scientists, O'Reilly Media, 2017, 978-1-491-95296-2
Essential References Materials	Colin O. Wu Xin Tian, Nonparametric Models for Longitudinal Data with Implementation in R, CRC Press, 978-1-4665-1600-7 Hongshik Ahn, Probability and Statistics for Science and Engineering with Examples in R [2nd ed.] Cognella,2018 978-1-5165-3111-0 Jay L. Devore, Probability and Statistics for Engineering and the Sciences. 9th Edition, Cengage Learning. ISBN: 1305251806.
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom, PC Laboratory
Technology Resources (AV, data show, Smart Board, software, etc.)	PC or Laptop with Windows/Linux, Smart Board, Projector
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
Final Exam Answer Scripts Verification	Peer faculty members	Review
Course Learning Outcomes Feedback	Students	Survey
Final Exam evaluation	Students	Survey

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes,Quality oflearning 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.	
Date	Nov - 2022