هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد NCAAA T4 2020

Course Specifications

Course Title:	Selected Topics in Data Science
Course Code:	CS476
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(3,0,1)**
2. Course type	
a.	University ☐ College ☐ Department ☐ Others ☒ X
b.	Required ☐ Elective ☒ x
3. Level/year at which this course is offered:	**Level 12/Year 4**
4. Pre-requisites for this course (if any)**: CS 322-Computer Organization**	
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**	33
2	**Laboratory/Studio**	
3	**Tutorial**	11
4	**Others** (specify)	
	Total	44

B. Course Objectives and Learning Outcomes

1. Course Description

This course aims to develop strong data analytic skills using both theoretical and case-based approach to apply data mining and advanced statistical techniques to real world problems facing the society. The students will learn about the use of various multivariate methods, how to design the study to collect data amenable for such analysis, and the issues involved in acquiring, storing, accessing, analyzing, and visualizing large, heterogeneous and real-time data associated with diverse real-world domains.

2. Course Main Objective

This course aims to review and complement foundation statistical knowledge and to establish the context for a range of methods, used in the analysis of simple and complex systems (including non-linear and multivariate scenarios). The course builds expertise in advanced analytics, data mining and quantitative reasoning that have become essential to meet the complexities of information requirement for decision making. The emphasis is on an intuitive understanding of the principles and a practical ability to apply these to real world data scenarios.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1		
1.2		
1.3		
1...		
2	**Skills :**	
2.1	CLO1- Ability to identify the characteristics of data and compare the data analysis techniques for various applications.	S1
2.2	CLO2- Ability to appreciate the issues involved in acquiring, storing, accessing, analyzing, and visualizing large, heterogeneous, and real-time data associated with diverse real-world domains	S4
2.3	CLO3- Ability to demonstrate and apply the various multivariate methods,	S2
2.4	CLO4- Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.	S4
2.5	CLO5- Ability to handle large scale analytics projects from various domains	S4
2.6		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Review of elementary data analytics and statistic topics - Types of Data, Statistical Summaries of Data	**8**
2	Exploratory Data Analysis and Data Visualization (using any one: R / Python	**4**

3	Regression Models- Fitting equations to Data and transformations	**4**
4	Simple Regression Models and Regression Diagnostics	**8**
5	Multiple Regression	**8**
6	Collinearity	**4**
7	Modeling Categorical Explanatory Variables	**8**
8	Modeling Time Series	**8**
9	Basic Classification Concepts, Rule Based Classifiers	**4**
10	Applications and Case Studies	**4**
Total		60

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			
1.2			
…			
2.0	**Skills**		
2.1	CLO1- Ability to identify the characteristics of data and compare the data analysis techniques for various applications.	Classroom Teaching	Quiz, Mid Exam, Final Exam, Assignment
2.2	CLO2- Ability to appreciate the issues involved in acquiring, storing, accessing, analyzing, and visualizing large, heterogeneous, and real-time data associated with diverse real-world domains	Classroom Teaching	Quiz, Mid Exam, Final Exam

2.3	CLO3- Ability to demonstrate and apply the various multivariate methods,	Classroom Teaching	Quiz, Mid Exam, Final Exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
2.4	CLO4- Ability to select and implement machine learning techniques and computing environment that are suitable for the applications under consideration.	Lab Exercises and Demonstration of experiments	Quiz and Homework
2.5	CLO5- Ability to handle large scale analytics projects from various domains	Classroom Teaching	Quiz, Mid Exam, Final Exam, Assignment
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quizzes	Week 3, Week 8	10%
2	Assignments	Week 4, Week 9	20%
3	Mid Term Exam	Week 6	20%
4	Homework	Week 10	5%
5	Exercise	Every Week	5%
6	Final Exam	Week 12	40%
7			
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 :

- 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 / Blackboard/ Email for advice and consultations

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• (Suggested): Ronald M. Weiers, Introduction to Business Statistics, 7th Edition, Cengage Publishers, 2010, ISBN: 053845217X • Daniel T. Larose, Discovering Knowledge in Data: An Introduction to Data Mining, 2nd Edition, Wiley, 2014, ISBN: 978-0-470-90874-7
Essential References Materials	
Electronic Materials	
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	**Class Room, PC**
Technology Resources (AV, data show, Smart Board, software, etc.)	**LCD Projector, R Statistical Language, Python**
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 Examination, Midterm Exam & Quizzes	Instructor	Direct
Survey	Students	Indirect
Final Examination Marks	Peers	Verification of Marks
Course Report	Quality Unit	Checklist quality reports

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	
Reference No.	
Date	