اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Data Visualization
Course Code:	**515PMDS -3**
Program:	**Professional Master of Data Science**
Department:	**Computer Science**
College:	**Collage of Computer Science and Information Systems**
Institution:	**Najran University**

Table of Contents

A. Course Identification

1. **Credit hours:**

2. **Course type**
a.   University ☐   College ☐   Department ■   Others ☐
b.   Required ☐   Elective ■

3. **Level/year at which this course is offered:**   Year 2/ Level 5

4. **Pre-requisites for this course** (if any)**:**

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**	50	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	20
3	**Tutorial**	
4	**Others** (specify)	
	Total	50

B. Course Objectives and Learning Outcomes

1. Course Description

Fundamental concepts of data visualization; information visualization types;design principles of data visualization; tools for static data visualization; tree and networkvisualizations; big data visualizations.

2. Course Main Objective

After successful completion of this course students should be able to:

- Employ best practices in data visualization to develop charts, maps, tables, and other visual representations of data.
- Use Tableau's visualization tools to conduct data analysis, especially exploration of an unfamiliar dataset.
- Create compelling, interactive dashboards to combine several visualizations into a cohesive and functional whole.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Describe opportunities for application of data visualization in various domains.	K1
1.2	Explain the appropriate data visualization techniques given particular requirements imposed by the data.	K2
1.3		
1...		
2	**Skills :**	
2.1	Present data with visual representations for target audience, task, and data	S1, S2
2.2	Apply appropriate design principles in the creation of presentations and visualizations.	S1, S2, S3
2.3	Analyze, critique, and revise data visualizations.	S1, S2, S3
2...		
3	**Values:**	
3.1		
3.2		
3.3		
3...		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction to data visualization	7
2	Design principles Categorical, time series, and statistical data graphics	7
3	Common Visualization Idioms	7
4	Visualization of Spatial Data, Networks, and Trees	7
5	Handling overlapping points	7
6	Dashboards, interactive and animated displays	7
7	Working with stakeholders and creating analytical products	7
	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**		
1.1	Describe opportunities for application of data visualization in various domains.	TS-1: Relate Course Learning Outcomes (CLOs) to the topics	Assignment, Midterm Exam Project and presentation
1.2	Explain the appropriate data visualization techniques given particular requirements imposed by the data.	TS-2: Lectures: using PPT presentation and other software to address verbally in front of students the concepts associated with examples with taking help of writing on the board as needed.	
…		TS-3: Communication: Given to students the main requirements of the project's reports and presentation	
		TS-4: Encourage students to read different journals, seminars or websites at their leisure time to have better understanding about Data visualization.	
		TS-5: Recall the topics of last lecture and the critical issues based on different topics, which certainly helps students to recall memory frequently and store that topic in their memory for long term	
2.0	**Skills**		
2.1	Present data with visual representations for target audience, task, and data	TS-1: Relate Course Learning Outcomes (CLOs) to the topics	Assignment, Midterm Exam, Lab Assessment
2.2	Apply appropriate design principles in the creation of presentations and visualizations.	TS-2: Lectures: using PPT presentation and other software to address verbally in front of students the concepts associated with	
2.3	Analyze, critique, and revise data visualizations		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
		examples with taking help of writing on the board as needed.	
		TS-3: LAB Work: Every student in the lab is using a separate PC. Practically showing them how to create a data visualization. TS-4: Tutorial: In the tutorials, we ask students to solve some problems in front of each other's and give them some comments and the right answers. TS-5: Communication: Given to students the main requirements of the project's reports and presentation TS-6: Recall the topics of last lecture and the critical issues based on different topics, which certainly helps students to recall memory frequently and store that topic in their memory for long term.	
3.0	**Values**		
3.1			
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Project, presentation and Quiz	Week 4,8 and 10	10%
2	Mid Term	Week 7th	20%
4	Lab Activity	Weeks1-10	10%
5	Lab Assessment 1	Week 10th	10%
6	Final Lab Exam	11	10%
7	Final Theory Exam	12 or 13	40%
8	Total		100%

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 faculty member should set up to 10 hours weekly as office hours in their time tables.

- Academic advisors are assigned to advice and support students.
- Instructors set specific office hours for each course he is teaching. The teaching load of staff members are available in the front of their offices.
- Instructors arrange and provide tutorials to students.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Sosulski, K. (2018). Data Visualization Made Simple: Insights into Becoming Visual. New York: Routledge
Essential References Materials	• Few, S. (2012). Show me the numbers: Designing tables and graphs to enlighten. Burlingame, CA: Analytics Press. • Interactive Data Visualization for the Web by Scott Murray 2nd Edition (2017) • Visualization Analysis & Design by Tamara Munzner (2014)
Electronic Materials	
Other Learning Materials	N/A

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	• Lecture Rooms with appropriate number of seats, Projector with Screen and a white board or a smart board. • All the computers in all the laboratories should be installed with the latest version of the required software.
Technology Resources (AV, data show, Smart Board, software, etc.)	• One PC and one projector and data show in the lecture room • Number of PCs according to strength of students in the lab room
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Tableau's visualization tools

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Student	Online course survey: By the end of each semester, students give their opinions about many factors in the course. They give feedback about the teaching strategies, assessment methods, textbooks, instructor, etc.
Effectiveness of Teaching	Student	Feedback about Course Learning Outcomes (CLOs): A course survey is distributed to students to take their opinions about the CLOs.
Assessment	Course coordinator	Checks all exams and make sure that they are related to CLOs and appropriate for the course

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	Computer Science Departmental Council
Reference No.	14440203-0185-00002
Date	1st Sep, 2022