DS 6390: Visualization of Information

Course Overview

This course is about communicating for impact using data visualizations. The course will guide students toward a mastery of the principles of telling stories with data. Students will practice applying these principles using a variety of tools. Our goal in this course is to develop students' ability to effectively communicate ideas using data visualization. These principles of data storytelling are tool agnostic and can be executed using a variety of software. This course will expose students to different tools used in industry, and students are encouraged to find the tool that best suits their needs.

Objectives

- Demonstrate competency in understanding and defining the situational context for data storytelling (including your audience, communication mechanism, and desired tone).
- Demonstrate competency in selecting the most effective forms of visualizations for their use case.
- Demonstrate an understanding of design principles to optimize visual perception.
- Demonstrate mastery of building complete and coherent stories with data.

Textbooks and Materials

Required Text:

Knaflic, Cole Nussbaumer. *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Wiley, 2015. ISBN: 978-1-119-00225-3

Grading

There will be practical assignments, presentations, and critiques. Attendance and proactive participation in live sessions is expected. Points will be awarded as described below.

Assignment/Assessment	Points	Weight on Final Grade
Case Studies: Case Study 1, Case Study 2, and Case Study 3	300 points (100 points each)	45 percent (15 percent each)
Midterm Assignment	100 points	25 percent
Final Assignment	100 points	30 percent

Grading Scale

Final grades are determined as follows:

95–100 A
90–94 A–
86–89 B+
83–85 B
80–82 B–
76–79 C+
73–75 C
70–72 C–
66–69 D+
60–65 D
0–60 F

Assignment and Assessment Information

Midterm Assignment
The midterm assignment (parts 1 and 2) is due prior to the week 7 live session. The midterm assignment is worth 25 percent of the final grade and is graded out of 100 points. To receive full credit, students must complete the assignment thoughtfully.

Part 1
The big idea is a concept that can help us get clear and succinct on the main message we want to get across to our audience. The big idea should articulate your unique point of view, convey what's at stake, and be a complete sentence. Consider a previous (recent) data science problem you've worked on either at work or in another class. You've already conducted the analysis, and you have some interesting insights to communicate.

Complete the big idea worksheet, located in the Toolbox in 2DS, for this specific problem, and keep in mind the key message you want to deliver to your audience. Upload the completed big idea worksheet as a Word document or PDF file to 2DS.

Part 2
Consider your big idea from part 1. Answer the following questions. Upload your responses in a Word document to 2DS.

1) Compare and contrast. Are there common points? How are they different? Which do you find to be more effective, and why? (500 words or less)

2) How did you frame? Reflect on the big idea you originally crafted. Did you frame it positively or negatively? What is the benefit or risk in this big idea? How could you reframe the opposite? (500 words or less)

Case Studies 1, 2, and 3
In each case, students will review and critique an existing data visualization and work with the data create an improved visualization. For assignment directions, go to the Case Study Materials folder in the 2DS Toolbox. Case study 1 is due prior to the week 11 live session, case study 2 prior to the week 12 live session, and case study 3 prior to the week 13 live session. Each case study is worth 15 percent of the total grade and is graded out of 100 points. Each case study should be submitted directly to 2DS. Students should answer the questions thoughtfully and reflect a mastery of the ideas referenced in each of the corresponding case studies.

Final Assignment
Students will convert the big idea from the midterm assignment into a targeted data story to be presented in the week 15 live session. This should include a visualization that is designed to induce action from the audience and also reflects the key design principles covered in the course. The presentation should be no more than five minutes, and students can use a tool of their choice (PowerPoint, Python, R, etc.). All presentation materials (final assignment materials) should be submitted to 2DS prior to the week 15 live session. The final assignment is worth 30 percent of the total grade and is graded out of 100 points.

Weekly Schedule

This course includes readings, programming assignments, presentations, and critiques. Plan a minimum of three hours of outside preparation for each hour of class. The due date for all assigned materials will be announced in advance. It is the student's responsibility to have all assignments ready on time.

Any student who has to be absent on an assignment due date must arrange to have the assignment submitted early. In addition, it is the student's responsibility to make up any missed work due to absence.

Method of Presentation
Prerecorded lectures will introduce the course concepts and specifications. Class time will be used to discuss concepts and project issues, work collaboratively, and ask questions. Students need to log in to live sessions prepared to use this time effectively.

Week	Topic	Readings (Due Prior to the Live Session)	Assignments (Due Prior to the Live Session)
1	Understanding the Context	Chapter 1 from the textbook	
2	Setting Objectives with the From-to/Think-Do Matrix		
3	Problem-Solution Centric Data Stories		
4	How to Tell Your Data Story		
5	Choose the Right Visual Display	Chapter 2 from the textbook	

6	Layered Grammar Graphics	Chapter 3 from the textbook	
7	Critiques of Data Visualization		Midterm
8	Using Altair		
9	Grammar of Animation		
10	Focusing the Audience's Attention	Chapter 4 from the textbook	
11	Think Like a Designer	Chapter 5 from the textbook	Case Study 1
12	Lessons from Story	Chapter 7 from the textbook	Case Study 2
13	Telling Your Story		Case Study 3
14	Data Story Case Study		
15	Final Assignment		Final Assignment

Attendance Policy

Students are expected to attend all live sessions. If a student is absent from class on the due date of any assignment, they are expected to make alternative arrangements to ensure that the assignment is turned in on time.

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University policy number 1.9.)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (*University Undergraduate Catalogue*)

Honor Code and Academic Integrity

All code you create in this course MUST be your own or clearly stated otherwise—NO EXCEPTIONS.

All work undertaken and submitted in the course is governed by the University's Honor Code. The relevant section of the Code, taken from the preamble of the Honor Council's Constitution:

Intellectual integrity and academic honesty are fundamental to the processes of learning and of evaluating academic performance, and maintaining them is the responsibility of all members of an educational institution. High personal standards of honesty and integrity are a goal of education in all the disciplines of the University. Students must share the responsibility for creating and maintaining an atmosphere of honesty and integrity. Students should be aware that

personal experience in completing assigned work is essential to learning. Permitting others to prepare their work, using published or unpublished summaries as a substitute for studying required materials, or giving or receiving unauthorized assistance in the preparation of work to be submitted are directly contrary to the honest process of learning. Students who are aware that others in a course are cheating or otherwise acting dishonestly have the responsibility to inform the professor and/or bring an accusation to the Honor Council.

A violation of the Honor Code may result in an "F" for the course, and the student may be taken before the Honor Council. If you are unclear about this policy, either in general or in its specific application, please see the instructor. The Honor Code is in the *SMU Student Handbook* and may be viewed online at http://smu.edu/studentlife/PCL_05_HC.asp.

Students with Disabilities

Students needing academic accommodations for a disability must first contact Disability Accommodations and Success Strategies (DASS) at 214-768-1470 or www.smu.edu/alec/dass.asp to verify the disability and to establish eligibility for accommodations. They should then schedule an appointment with the professor to make appropriate arrangements. (See University policy number 2.4; an attachment describes the DASS procedures and relocated office.)

__Important Note__ This syllabus is only a guideline and not a legal contract. The professor of record for the course has final say on any policies, due dates, and so on.