

## ***Data Visualization Syllabus***

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### **Course Information**

<i>Course Number/Section</i>	MIS 6380.001
<i>Course Title</i>	Data Visualization
<i>Term</i>	Spring 2023

### **Professor Contact Information**

<i>Professor</i>	Dr. Judd D. Bradbury
<i>Office Phone</i>	972-883-4873
<i>Mail Contact</i>	e-Learning eMail
<i>Office Hours</i>	Thursday 9:00 – 10:00 AM with appointment

### **Class Participation**

Regular class participation is expected regardless of course modality. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

### **Class Recordings**

Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

The instructor may record meetings of this course. Any recordings will be available to all students registered for this class as they are intended to supplement the classroom experience. Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

### **Class Materials**

The Instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may

be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

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### **Course Description**

This course is designed to provide students with an understanding of data visualization within the context of data science. The Data Visualization course will be exploring a number of non-traditional techniques for teaching the concepts and skills required as a data science professional working in data visualization. The course is technically demanding requiring programming and quick assimilation of a large number of tools. Please understand that in order to effectively learn the concepts and approaches in this course, you will need to work very hard for long hours every week. If you like to wait until the day before your assignments are due to begin your work, you should drop this course. If you are up for this personal responsibility, please join us!

### **Student Learning Objectives**

1. Provide students with an understanding of the principles of descriptive and exploratory data visualization.
2. Provide students with visual tools for solving business problems.
3. Provide students with the ability to compose data stories for effective corporate communication of analytical insights.

### **Student Learning Outcomes**

1. Students will be able to acquire, parse, and manipulate data sets
2. Students will be able to create publishing quality data visualizations from base data sets
3. Students will be able to use exploratory data visualization as an analytical tool for business
4. Students will be able to compose data narratives using data visualizations

### **Required Textbooks**

The following textbooks are available electronically for free in the UT Dallas Library. Click on the link below and search for the title.

<http://www.utdallas.edu/library/>

*Visualization Analysis and Design* – Tamara Munzner

*Design for Information* – Isabel Meirelles

*Storytelling with Data: Let's Practice* - Cole Nussbaumer Knaflic

### **Required Materials**

Web Camera

A **Windows** laptop must be used to complete the **Power BI** and **ESRI ARCGIS** assignments. Students using a laptop running OSX may wish to install a PC emulator. We are happy to provide a guide for installing bootcamp on request.

## Course Policies

A solemn duty will be upheld by your professor to maintain a level playing field for all students.

- **Assignments are due at midnight on the due dates defined in the syllabus**
- **Assignments must be submitted through e-learning**
- **Do not use the Microsoft Edge browser for submissions as it will damage documents**
- **Students are provided only one submission attempt per assignment**
- **Late assignments receive a 25% discount more than 7 calendar days late is a 0/100**
- **Completing assignments is 100% a student responsibility, we help, we do not tutor**
- **Interim quizzes will be provided to ensure students study the material each week**
- **Students are required to attend every class, speak, and monitor e-learning daily**
- **Missed exams will be provided with a 0/100**
- **We do not provide extra credit assignments**
- **A signed note from a medical doctor will be required for any grading impacted policy**
- **Colds, headaches, upset stomach and/or flu are not acceptable excuses for missing class or deliverables**
- **Students will receive the grades they earn, requests to change grades will be deleted**
- **We will only discuss grade calculation errors, we will not discuss your grade preference**

## Communication

This course utilizes online tools for interaction and communication. For more details, please visit the eLearning Tutorials webpage

<http://www.utdallas.edu/elearning/students/eLearningTutorialsStudents.html> for video demonstrations on eLearning tools.

- **Instructor will communicate with announcements and discussion board postings**
- **Communication sequence is:**
  1. **Discussion board posting**
  2. **Attend optional lab**
  3. **Course message to professor (If no response to discussion board in 24 hours)**
- **Individual concerns or questions should be sent in a course message**
- **Professor and teaching assistants are off duty on weekends**
- **Discussion board postings should always include:**
  1. **Exercise and step number**
  2. **Description of the last step that worked**
  3. **Screen shot of the error**
- **Discussion board postings are not markers that can be placed on the professor**
- **Blanket e-mails or lobbying your classmates is inappropriate student conduct**
- **Discussion board posts regarding course policies and/or answers will be deleted**

## Technical Requirements

In addition to a confident level of computer and Internet literacy, certain minimum technical requirements must be met to enable a successful learning experience. Please review the important technical requirements <http://www.utdallas.edu/elearning/students/getting-started.html#techreqs> on the Getting Started with eLearning webpage <http://www.utdallas.edu/elearning/students/getting-started.html>.

## Technical Specifications (Recommended)

RAM - 8GB  
Processor - Intel i5 2.4 Ghz (minimum)  
Graphics Processor - 512 MB (Dedicated)

### Course Access and Navigation

The course can be accessed using the UT Dallas NetID account at: <https://elearning.utdallas.edu>. Please see the course access and navigation <http://www.utdallas.edu/elearning/students/getting-started.html#courseaccessandnav> section of the site for more information.

To become familiar with the eLearning tool, please see the Student eLearning Tutorials <http://www.utdallas.edu/elearning/students/eLearningTutorialsStudents.html>. UT Dallas provides eLearning technical support 24 hours a day/7 days a week. The eLearning Support Center <http://www.utdallas.edu/elearninghelp> services include a toll-free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service.

### Distance Learning Student Resources

Online students have access to resources including the McDermott Library, Academic Advising, The Office of Student AccessAbility, and many others. Please see the eLearning Current Students page <http://www.utdallas.edu/elearning/students/cstudents.htm> for details.

### Server Unavailability or Other Technical Difficulties

The University is committed to providing a reliable learning management system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and also contact the online eLearning Help Desk <http://www.utdallas.edu/elearninghelp>. The instructor and the eLearning Help Desk will work with the student to resolve any issues at the earliest possible time.

### Assignments & Academic Calendar

WEEK BEGIN	TOPIC/LECTURE	READING	ASSESSMENT / ACTIVITY	EXERCISE DUE DATE
1 1/16	Descriptive Data Visualization	Graphics and graphic information processing, p. 1-15, 186-197 & 213-230 – Jacques Bertin	<b>Exercise 1 – Data Measurement</b>  <b>Class Policy Test</b>	<b>1/20</b>
2 1/23	Visualization in Tableau	Visualization Analysis and	<b>Exercise 2 - Building a</b>	<b>1/27</b>

		Design, Chapter 1 & 2, Tamara Munzner	<b>Visualization Worksheet in Tableau</b>	
3 1/30	Data Manipulation & Process for Data Visualization	Visualization Analysis & Design, Chapter 3, Tamara Munzner	<b>Exercise 3 – Data Cleansing with Python</b>	<b>2/3</b>
4 2/6	Animated Data Visualization (Powerview)	Beautiful Visualization, Chapter 19, Danyel Fisher – Julie Steele & Noah Illinsky	<b>Exercise 4 – Animation with Power BI</b>	<b>2/10</b>
5 2/13	Narrative Visualization	Strategic Stories – Gordon Shaw, Robert Brown and Philip Bromiley  Storytelling with Data: Let’s Practice, Chapters 1 and 2 - Cole Nussbaumer Knafllic	<b>Case Study 5 –Data Story</b>	<b>2/17</b>
6 2/20	Narrative Visualization	Visualization Rhetoric – Jessica Hullman  Storytelling with Data: Let’s Practice, Chapters 6 - Cole Nussbaumer Knafllic	<b>Case Study 5 –Data Story</b>	<b>2/24</b>

7 2/27	Visualization with Maps (Tableau)  Midterm Exam Review	Design for Information, Isabel Meirelles, Chapter 4	<b>Exercise 6 – Maps in Tableau</b>	<b>3/3</b>
8 3/6	Midterm Exam Review	Students must schedule their exam seat 48 hours in advance to receive the exam curve	<b>Midterm Exam</b>	<b>3/10</b>
9 3/13	Spring Break		Spring Break	
9 3/20	Integrated Data Analysis	Knowledge Generation Model for Visualization Analytics – Sasha et al.	<b>Exercise 7 – Integrated Analysis with R</b>	<b>3/24</b>
10 3/27	Small Multiples	Visualization Analysis & Design, Chapter 12 - Tamara Munzner	<b>Exercise 8 – Small Multiples</b>	<b>3/31</b>
11 4/3	SpatioTemporal Maps, ARCGIS & Geocoding  Network Visualization	Design for Information, Isabel Meirelles, Chapter 5  Design for Information, Isabel Meirelles, Chapter 2  Visualization Analysis and Design, Chapter 9 – Tamara Munzner	<b>Exercise 9 - Business Location Analysis</b>  <b>Exercise 10 - Network Visualization</b>	<b>4/7</b>

12 4/10	Web Based Visualization	Interactive Data Visualization for the Web, Scott Murray, Chapters 2-9	<b>Exercise 11 - D3</b>	<b>4/14</b>
13 4/17	Visualization with Python/Altair		<b>Exercise 12 - Python Altair</b>	<b>4/21</b>
14 4/24	Hierarchical Data Visualization Final Exam Review	Design for Information, Isabel Meirelles, Chapter 1.	<b>Exercise 13 - Treemaps</b>	<b>4/28</b>
15 5/1	Exam Review	Students must schedule their exam seat 48 hours in advance to receive the exam curve	<b>Final Exam</b>	<b>5/5</b>

### Exam Procedures

Exams will be administered electronically in a human proctored testing center using an eLearning online exam.

The syllabus has been posted with the exam dates that the testing center confirmed. Please go ahead and book your exam seats for all exams in the UTD testing center in the first week of the semester.

### On Campus Testing Center

- Students must book their seat in the testing center at least 48 hours in advance of taking the exam. Students that do not book their seat in advance will not qualify for the exam curve.
- Booking a seat can be performed here <https://www.registerblast.com/utdallas/Exam/List>

### Grading Policy

#### Weights

Assignments		42%
Case Study		7%
Midterm Exam		25%
Final Exam		25%

Class Policy Test, Evaluation Quiz, In Class Quiz		1%
Total		100%

### Grading Scale

Scaled Score	Letter Equivalent
>= 93	A
>= 90	A-
>= 86	B+
>= 83	B
>= 80	B-
>= 76	C+
>= 70	C
< 70	F

### Comet Creed

*This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:*

“As a Comet, I pledge honesty, integrity, and service in all that I do.”

### Academic Integrity

The faculty, administration, and student body of UT Dallas expects a high level of responsibility and academic integrity. These expectations and specific prohibitions are published by the office of community standards here:

<https://conduct.utdallas.edu/dishonesty/>

**Students in this course suspected of academic dishonesty are subject to disciplinary proceedings by the office of Judicial Affairs. If found responsible, the following sanctions will be applied:**

- 1. Assignments – One letter grade reduction**
- 2. Projects & Case Studies – One letter grade reduction**
- 3. Quizzes – One letter grade reduction**
- 4. Exams – F as the final course grade**

As a positive incentive for students with integrity, the School of Management reviews a student’s disciplinary record, on file with the Dean of Students, as one of the criteria for determining a student’s eligibility for a scholarship.

### UT Dallas Syllabus Policies and Procedures



The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to <http://go.utdallas.edu/syllabus-policies> for these policies.

***The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.***