

# Course Syllabus

## **MIS 6380**

The University of Texas at Dallas

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## Course Information

### Course

Course Number Section **MIS 6380**  
Course Title **Data Visualization**  
Term and Dates **Fall 2016**

### Professor Contact Information

Professor Judd D. Bradbury  
Office Phone 972-883-4873  
Mail Contact e-learning course messages only (first priority)  
Office Location SOM 3.220  
Office Hours Thursday 4:00 PM – 5:00 PM

### About the Course

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!

### About the Instructor

Mr. Bradbury is a talented business management professional with 20 years of industry experience advising Fortune 500 companies. He is a unique business leader that is comfortable engaging and collaborating with all types of businesses, employees, professionals, community leaders, and students. His consulting experience includes assignments performing strategic analysis, international strategy, supply chain management, business process design, enterprise systems implementation, turnaround management, and corporate communications. His educational experience includes corporate training, post-graduate, and graduate education. He is comfortable working in nuanced environments that require attention to corporate and local cultures.

### Course Description

This course is designed to provide students with an understanding of data visualization within the context of data science.

### **Student Learning Objectives**

1. Provide students with a understanding of the principles of descriptive and exploratory data visualization.
2. Provide students will 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

### **Required Textbooks and Materials**

All required reading is listed in the course schedule. All text materials are accessible electronically through the UT Dallas Library.

### **Course Policies**

#### *Assignments*

Assignments are due by the dates provided on the syllabus. There are no make-up exams or extra credit opportunities. Work performed will be submitted through eLearning on time with no exceptions. Assignments submitted after the deadline will be considered late. **A 25% penalty will be assessed for students submitting assignments past the due date/time. Assignments more than 7 calendar days late are subject to a zero. Students are encouraged to form working groups. Ensure that your assignment submissions are your own work. Your professor is not your tutor. Completing assignments on time is 100% a student responsibility.**

**We will conduct periodic pop quizzes throughout the semester to ensure students are studying the material every week.**

#### *Class Participation*

Students are required to attend, speak, present, and login regularly to the online class site. The instructor will use the tracking feature in eLearning to monitor student activity. Students are also required to participate in all class activities such as discussion boards, chat or conference sessions and group projects.

#### *Virtual Classroom Citizenship*

The same guidelines that apply to traditional classes should be observed in the virtual classroom environment. Please use proper netiquette when interacting with class members and the professor. It is inappropriate student conduct to blanket e-mail or lobby your fellow classmates regarding personal performance or preferences in the course. Discussion board posts about course policies and answers to exercises will be deleted.

#### *Medical Issues*

Instructor will review the impact of medical issues documented by a medical doctor. Colds, flu, and headaches are not acceptable excuses for missing class, a test, or failing to submit an assignment on time.

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## 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](#) on the [Getting Started with eLearning webpage](#).

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## Course Access and Navigation

This course was developed using a web course tool called eLearning that is delivered online. Students will use their UTD NetID account to login at: <http://elearning.utdallas.edu>. Please see more details on [course access and navigation information](#).

To get familiar with the eLearning tool, please see the [Student eLearning Tutorials](#).

UTD provides eLearning technical support 24 hours a day/7 days a week. The services include a toll free telephone number for immediate assistance (1-866-588-3192), email request service, and an online chat service. Please use this link to access the UTD eLearning Support Center: <http://www.utdallas.edu/elearninghelp>.

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## Communications

Interaction with Instructor: The instructor will communicate with students mainly using the Announcements and Discussions tools. Students may send personal concerns or questions to the instructor using the course messages tool. The instructor will reply to student messages or Discussion board messages within 3 working days under normal circumstances. I generally check course messages once each day during the week and I am off duty on weekends. Communications over the weekend will be answered on Monday. Please remember that I am a human like all of you with family obligations and outside commitments. I will always respond to your inquiry as soon as possible.

Interaction with Teaching Assistant: The teaching assistant will regularly answer questions posted to the discussion board. All postings should be professional and define the specific exercise and step number of your issue, as well as what you know, and what you do not know.

Course messages and postings to the discussion board are not markers that can be placed on the professor. All responsibility for turning in assignments on time rests with the student.

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## Student Resources

The following university resources are available to students:

**UTD Distance Learning:** <http://www.utdallas.edu/elearning/students/cstudents.htm>

**McDermott Library:** Distance Learners (UTD students who live outside the boundaries of Collin, Dallas, Denton, Rockwall, or Tarrant counties) will need a UTD-ID number to access all of the library's electronic resources (reserves, journal articles, ebooks, interlibrary loan) from off campus. For UTD students living within those counties who are taking online courses, a Comet Card is required to check out materials at the McDermott Library. For more information on library resources go to <http://www.utdallas.edu/library/distlearn/disted.htm>.

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## Student Assessments

### Grading Information

#### Weights

Assignments		40%
Case Study 1		20%
Case Study 2		20%
Class Policy Test & Quizes		20%
Total		100%

#### Grading Scale

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

### Grading Policy

This class assumes the student is working in a professional business environment. All assignments will be graded based upon the appropriateness of the content and presentation. I appreciate students that schedule appointments to learn more about the **Content** in the course.

**Students will receive the exact grades that they earn. Negotiating for a higher grade is unethical and will be immediately denied. Do not ask for your grade to be changed. If you send an e-mail about changing your grade, it will be deleted without response.**

**Historically we have had several students wanting to meet in the last week of class to discuss changing their grades. To discourage this behavior we have a blackout period starting a week before the final exam through the end of the semester where we will not discuss student grades. If you are concerned about your grades, schedule a meeting early in the semester.**

**Fast Track Students:** In order to receive course credit you must receive a grade of B or higher. No we will not adjust your grade for any reason. This is a difficult course make sure you are capable of success before the drop date. If you cannot make the B, drop the course.

### **Accessing Grades**

Students can check their grades by clicking “My Grades” under Course Tools after the grade for each assessment task is released.

### **Assignments**

#### *Assignments*

Students will receive weekly assignments designed to build skills working in the respective business warehouse and business intelligence systems.

#### *Changes in Assignments*

From time to time an assignment will need to be changed during the semester. Changes in assignments or schedules will be posted on e-Learning. It is the student’s responsibility to keep up with the changes that are posted on e-Learning.

### **Assignment submission instructions**

**Do not e-mail homework files to the professor or teaching assistant.**

Locate the assignment in your eLearning course. You will submit your assignments in the required file format with a simple file name and a file extension. To submit your assignment, click the assignment name link and follow the on-screen instructions to upload and submit your file(s). For additional information on how to submit assignments, view the [Submitting An Assignment video tutorial](#).

**Please note:** Each assignment link will be deactivated after the assignment due date time. After your submission is graded, you may click each assignment’s “Graded” tab to check the results and feedback.

Work performed in SAP will be submitted through eLearning on time with no exceptions. Assignments submitted after the deadline will be considered late. **A 25% penalty will be assessed for students submitting assignments past the due date/time. Assignments more than 7 calendar days late are subject to a zero.**

### **Exam Information**

**This course requires case study projects delivered on the posted dates. All students in the course will present on the scheduled date and time without exception. No we will not re-schedule your project presentation for personal preference. Plan to be available at the scheduled time or drop the course. If you skip or miss your presentation at the scheduled time you will receive a zero.**

If any student needs special accommodations, please seek the instructor's approval in advance. If you have any questions about using either UTD or outside testing center service, please email [proctoredexam@utdallas.edu](mailto:proctoredexam@utdallas.edu)

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## Academic Calendar

WEEK BEGIN	TOPIC/LECTURE	READING	ASSESSMENT / ACTIVITY	EXERCISE DUE DATE
1 8/22	Descriptive Data Visualization	<b>Graphics and graphic information processing, p. 1-15, 186-197 &amp; 213-230 – Jacques Bertin.</b>  <b>Class Policy Test.</b>	<b>Exercise 1 – Data Measurement</b>	<b>8/26</b>
2 8/29	Data Acquisition	<b>Visualize This, Chapter 2 – Nathan Yau.</b>  <b>Visualizing Data, Chapters 5 &amp; 10 - Ben Fry.</b>	<b>Exercise 2 – Web Scraping</b>	<b>9/2</b>
3 9/5	Data Manipulation & Process for Data Visualization	<b>Visualization Analysis &amp; Design, Chapter 2 p. 21-40, Chapter 3 p. 43-58, Chapter 4 p. 67-74 - Tamara Munzner.</b>	<b>Exercise 3 – Data Cleansing</b>	<b>9/9</b>
4 9/12	Animated Data Visualization (Powerview)	<b>Beautiful Visualization, Chapter 19, Danyel Fisher – Julie Steele &amp; Noah</b>	<b>Exercise 4 – Powerview</b>	<b>9/16</b>

		<b>Illinsky.</b>		
5 9/19	Visualization with Maps (Tableau)	<b>Design for Information, Isabel Meirelles, Chapter 4.</b>	<b>Exercise 5 – Tableau Storytelling Small multiples in Tableau Storm Data</b>	<b>9/23</b>
6 9/26	Narrative Visualization	<b>Narrative Visualization: Telling Stories with Data – Edward Segel &amp; Jeff Heer.</b>  <b>Deeper Understanding of Sequence in Narrative Visualization – Jessica Hullman.</b>	<b>Exercise 6 – Data Stories</b>	<b>9/30</b>
7 10/3	<i>Case Study 1 - Project Presentations</i>		<b>Case Study 1 -Project Presentations</b>	<b>10/3</b>
8 10/10	Integrated Data Analysis	<b>R for Everyone, Chapter 2 &amp; 22 - Jared Lander.</b>  <b>R in a Nutshell, Chapter 13, 14 &amp; 15 – Joseph Adler.</b>  <b>Customer and business analytics applied data mining for decision making using R, Chapter 7 – Daniel Putler.</b>	<b>Exercise 7 – Analysis Using R</b>	<b>10/14</b>

9 10/17	Small Multiples	<b>Visualization Analysis &amp; Design, Chapter 12 - Tamara Munzner.</b>	<b>Exercise 8 – Multi-maps using Qlikview Data</b>	<b>10/21</b>
10 10/24	SpatioTemporal Maps, ARCGIS & Geocoding	<b>Design for Information, Isabel Meirelles, Chapter 5.</b>	<b>Exercise 9 - Animated Visualization &amp; Geocoding</b>	<b>10/28</b>
11 10/31	Network Visualization	<b>Design for Information, Isabel Meirelles, Chapter 2.</b>	<b>Exercise 10 - Network Visualization using Gephi</b>	<b>11/4</b>
12 11/7	Visualizing with D3 Basics	<b>Interactive Data Visualization for the Web, Scott Murray, Chapters 3, 4, &amp; 5.</b>	<b>Exercise 11 - HTML, SVG, CSS, Javascript, Github</b>	<b>11/11</b>
13 11/14	Visualizing with D3 Advanced	<b>Interactive Data Visualization for the Web, Scott Murray, Chapters 2 &amp; 6,7,8 &amp; 9.</b>	<b>Exercise 12 - Github D3 Sales/Product Data</b>	<b>11/18</b>
14 11/21	Winter Break	<b>Winter Break</b>	Winter Break	<b>12/2</b>
15 11/28	<i>Case Study 2 - Project Presentations</i>		<b>Case Study 2 - Project Presentations</b>	<b>11/28</b>
16 12/5	Hierarchical Data Visualization	<b>Design for Information, Isabel Meirelles, Chapter 1.</b>	<b>Exercise 13 - Heatmap Sales Product Data</b>	<b>12/9</b>

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## Scholastic Honesty

The University has policies and discipline procedures regarding scholastic dishonesty. Detailed information is available on the [UTD Judicial Affairs](#) web page. All students are expected to maintain a high level of responsibility with respect to academic honesty. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced.

### Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. **Procedures are defined and described in the Rules and Regulations of the Board of Regents of the University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student Services and Activities of the Course Syllabus Page 8, University's Handbook of Operating Procedures.** Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SSB 4.400, 972/883- 6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

### Academic Integrity

The faculty and administration of the School of Management expect from our students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrates a high standard of individual honor in his or her scholastic work. We want to establish a reputation for the honorable behavior of our graduates, which extends throughout their careers.

**The Judicial Affairs website lists examples of academic dishonesty. Dishonesty includes, but is not limited to cheating, plagiarism, collusion, facilitating academic dishonesty, fabrication, failure to contribute to a collaborative project and sabotage. Some of the ways students may engage in academic dishonesty are:**

- **Coughing and/or using visual or auditory signals in a test;**
- **Concealing notes on hands, caps, shoes, in pockets or the back of beverage bottle labels;**
- **Writing in blue books prior to an examination;**
- **Writing information on blackboards, desks, or keeping notes on the floor;**

- Obtaining copies of an exam in advance;
- Passing information from an earlier class to a later class;
- Leaving information in the bathroom;
- Exchanging exams so that neighbors have identical test forms;
- Having a substitute take a test and providing falsified identification for the substitute;
- Fabricating data for lab assignments;
- Changing a graded paper and requesting that it be regraded;
- Failing to turn in a test or assignment and later suggesting the faculty member lost the item;
- Stealing another student's graded test and affixing one's own name on it;
- Recording two answers, one on the test form, one on the answer sheet;
- Marking an answer sheet to enable another to see the answer;
- Encircling two adjacent answers and claiming to have had the correct answer;
- Stealing an exam for someone in another section or for placement in a test file;
- Using an electronic device to store test information, or to send or receive answers for a test;
- Destroying or removing library materials to gain an academic advantage;
- Consulting assignment solutions posted on websites of previous course offerings;
- Transferring a computer file from one person's account to another;
- Transmitting posted answers for an exam to a student in a testing area via electronic device;
- Downloading text from the Internet or other sources without proper attribution;
- Citing to false references or findings in research or other academic exercises;
- Unauthorized collaborating with another person in preparing academic exercises.
- Submitting a substantial portion of the same academic work more than once without written authorization from the instructor.

<http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-Basicexamples.html>

Updated: August, 2011

Plagiarism on written assignments, especially from the web, from portions of papers for other classes, and from any other source is unacceptable. On written assignments, this course will use the resources of [turnitin.com](http://turnitin.com), which searches the web for plagiarized content and is over 90% effective.

During tests and quizzes, students in this section are not allowed to have with them any food or drinks, scratch paper, course materials, textbooks, notes, invisible ink pens, or electronic devices, including iPads, iPhones, iPods, MP3 Players, earphones, radios, smart phones, cameras, calculators, multi-function timepieces, or computers. When possible, students should sit in alternating seats, face forward at all times, and remove any clothing which might conceal eye movements, reflect images of another's work, or hide course material for copying. Exam proctors will monitor any communication or signaling between students by talking, whispering, or making sounds, or by using your hands, feet, other body movements, the test paper itself or your writing implement.

**Students in this course suspected of academic dishonesty are subject to disciplinary proceedings, and if found responsible, the following sanctions will be applied:**

- 1. Homework – One letter grade reduction**

2. **Case Write-ups – One letter grade reduction**
3. **Quizzes – One letter grade reduction**
4. **Presentations – One letter grade reduction**
5. **Group Work – One letter grade reduction**
6. **Tests – F for the course**

These sanctions will be administered only after a student has been found officially responsible for academic dishonesty, either through waiving their right for a disciplinary hearing, or being declared responsible after a hearing administered by Judicial Affairs and the Dean of Student's Office .

In the event that the student receives a failing grade for the course for academic dishonesty, the student is not allowed to withdraw as a way of preventing the grade from being entered on their record. Where a student receives an F in a course and chooses to take the course over to improve their grade, the original grade of F remains on their transcript, but does not count towards calculation of their GPA.

**The School of Management also reserves the right to review 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.**

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## **Course Evaluation**

As required by UTD academic regulations, every student must complete an evaluation for each enrolled course at the end of the semester. A link to an online instructional assessment form will be emailed to you for your confidential use.

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## **University Policies**

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.

## **Email Use**

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T.

Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

### **Withdrawal from Class**

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

### **Student Grievance Procedures**

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the Dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

### **Incomplete Grade Policy**

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

### **Disability Services**

"If you have a disability that requires accommodations under the American's with Disabilities Act Amendment Act -2008(ADAAA), please present your letter of accommodations from the Office of Student AccessAbility and meet with me as soon as possible so that I can support your success in an informed manner. If you would like to know more about the University of Texas at Dallas, Office of Student AccessAbility, please contact the office at 972-883-2098 or

email: [studentaccessability@utdallas.edu](mailto:studentaccessability@utdallas.edu). Our office is located in the Student Service Building (SSB), suite 3.200.

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

### **Religious Holy Days**

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

***These descriptions and timelines are subject to change at the discretion of the professor.***

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