1. Course Information

Course Title: Data Visualization

Course number: MATH 4381

Credit. Hours: 3  Semester: SPRING 2018

Room #: MATH 116  Days & hours: M/W 5:30-6:45 p.m.

Web page/BlackBoard site: MBA 5393B on Blackboard

2. Instructor Information

Name: Jack Follis, Ph.D.
Office location: Math 113
Office phone: 713-942-5046
Office hours: MW 11 a.m. – 2:30 p.m.
TTh 10 a.m. – 11 a.m.

E-mail: follisj@stthom.edu

3. Course Catalog Description

Data Visualization
Appropriate visualizations of data are a key to revealing patterns and communicating important findings in research. This course will build on statistical and analytical thinking by emphasizing the role and use of visualizations in the analysis of data. Theories, techniques and software for managing, exploring, analyzing, displaying and communicating information about various types of data will be introduced. Visualizations will be produced using readily available real-world data sets.
5. Course Learning Objectives

Learning Objectives

Upon completion of the course, the student will be able to:

- Identify strengths and weaknesses of data visualizations
- Identify key factors for an effective visualization of data
- Use appropriate visualizations for different types of data
- Manipulate data in data sets
- Merge and clean data sets from multiple sources

6. Texts, Readings, Materials

Textbook:
The Visual Display of Quantitative Information, Tufte
Visualize This: The FlowingData Guide to Design, Visualization, and Statistics, Yau

7. Instructional methods: This is blended learning course. The structure of this course will be approximately 50% in class, and 50% online.

8. Technology

1) Students are expected to utilize the Excel, R Statistical Package and/or Tableau or other statistical software packages to complete assignments.

2) Course syllabus, documents, and lectures will be available on the UST Blackboard site.

3) Students are expected to access their UST email accounts. All email communications from the professor will be via the email list in Blackboard and this will send emails to the UST email account of each student. If you do not regularly access this account it is **IMPERATIVE** that you have your email forwarded to the account which you regularly use.
9. Course Tentative Schedule:
The below schedule and procedures in this course are tentative; they may change based on the progress we make in class and in the event of circumstances beyond the instructor's control.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Date</th>
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<tbody>
<tr>
<td>Introduction</td>
<td>Weeks 1</td>
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<tr>
<td>1. Course Overview</td>
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<tr>
<td>2. Intro to Visualization</td>
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<tr>
<td>Data &amp; Software</td>
<td>Weeks 2-3</td>
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<tr>
<td>1. Introduction to R and Tableau</td>
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<tr>
<td>2. Data Sources</td>
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<td>3. Data Munging/Wrangling</td>
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<tr>
<td>Visualizations</td>
<td>Weeks 4-10</td>
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<tr>
<td>1. Categorical Data</td>
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<td>2. Time Series Data</td>
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<td>3. Multivariate</td>
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<td>4. Geospatial</td>
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<td>Interactive Visualizations</td>
<td>Weeks 11-14</td>
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<tr>
<td>1. Tableau</td>
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<td>2. R Shiny</td>
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10. Course Policies

- *Class participation includes punctuality in attendance.* I expect you to arrive, be seated, and be ready for class on time, and to stay in class for the entire session. Arriving late is inconsiderate to fellow students as well as to the instructor. Late-comers also miss announcements, handouts, and miss the initial thrust of the class.
- Attendance will be taken in every class.
- *Class participation also includes maintaining a professional atmosphere in class.* This means utilizing computers and technology suitably (silencing wireless devices, no web-browsing or emailing), and refraining from distracting activities during class (side conversations or games). Computers and technology are to be focused on classroom activities only.
- Your class participation will be evaluated subjectively, but will rely upon measures of punctuality, attendance, in-class work, relevance and insight reflected in classroom questions, and commentary. Relative differences in technical background will not be a criterion. Students will be expected to be familiar with the readings, even though they might not understand all of the material in advance. In general, questions and comments are encouraged.
11. Student Grading Processes:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Assignments **</td>
<td>40%</td>
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<tr>
<td>Project 1</td>
<td>30%</td>
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<tr>
<td>Project 2</td>
<td>25%</td>
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<tr>
<td>Attendance, Participation****</td>
<td>5%</td>
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<tr>
<td>**Total</td>
<td>100%</td>
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** Late assignments and/or electronic submissions will only be accepted with the instructor’s approval.

**** You will lose attendance and participation grade with 2 absences.

Grading Scale for this Course:

- **A** = 93 to 100
  - **A-** = 90 to 92.9
  - **B+** = 88 to 89.9
  - **B** = 83 to 87.9
  - **B-** = 80 to 82.9
  - **C+** = 78 to 79.9
  - **C** = 73 to 77.9
  - **C-** = 70 to 72.9
- **F** = Below 70

12. Available Support Services:

Students needing extra assistance with course concepts are advised to take advantage of the tutorial services offered by the Department of Mathematics, Computer Science and Cooperative Engineering, The Cameron School of Business or visit the Tutorial Services Center.
Policy on Academic Dishonesty
(From the 2016-2017 Undergraduate Catalog)

Policy/Procedure
Every offense against academic honesty seriously undermines the teaching-learning process for which the University exists, and such offenses will be dealt with expeditiously according to the following criteria.

Definition
Academic dishonesty includes but is not limited to:
1. Cheating on an examination or test; for example, by copying from another’s work or using unauthorized materials before or during the test, including the use of electronic devices;
2. Plagiarism, which represents as one’s own the work of another, whether published or not, without acknowledging the precise source;
3. Participation in the academic dishonesty of another student, even though one’s own work is not directly affected;
4. Any conduct which would be recognized as dishonest in an academic setting.

Penalty
The penalty for an incident of academic dishonesty is, at the discretion of the faculty member, either a mark of zero for the work in question or a grade of F for the course.

Disabilities
Any student with a disability requiring accommodations in this course is encouraged to contact me after class or during office hours. Additionally, students will need to contact Counseling and Disability Services in Crooker Center. This office can be reached at (713) 525-2169 or 6953

DROPPING THE COURSE: If you decide you do not wish to continue the course, it is your responsibility to go through the proper channels and officially drop the course.