MGMT 3125 - Introduction to Data Visualization

School of Business | Business Analytics

Fall 2018 | Online (Required Orientation on 9/6/2018 @ 12:30pm, F-114)

Instructor information:

Name	John Sokol, Adjunct Professor of Business
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Communication	Email or Blackboard; see 'Communication'
Office Hours	Every Wednesday 9/26 onward, 5:00pm – 7:00pm G-112

Course Description:

- Introduction to Data Visualization provides an overview of business analytics, including the process of business analytics / business intelligence analysis, big data management, and principles of data visualization and dashboard design. The course uses spreadsheet software (Excel, Google Sheets) and Tableau.

Prerequisites:

- CSIS 1206 (Statistics) with a letter grade of C or better.
- General computer skills and familiarity. An understanding of basic charting and statistical terms/practices will be helpful, but not required.

Required Textbook:

- Storytelling with Data: A Data Visualization Guide for Business Professionals, by Cole Nussbaumer Knaflic, 1st edition, WILEY. ISBN-13: 978- 1119002253.
    - Amazon (as of 9/5/2018)
        - Used: approximately $15 paperback ($10.87 book + $3.99 shipping).
        - New: $17.65 paperback ($17.65 book + $0.00 shipping).
    - Chegg (as of 9/5/2018)
        - Rent: $17.99 paperback, free shipping

Required Software:

- Tableau
    - Tableau for Students is available for *free* download via the Tableau website.
    - Tableau will be the main tool to create data visualizations/dashboards. The goal is to apply the concepts learned in the Knaflic textbook to building clean, simplistic, attention grabbing Tableau dashboards that provides immediate insight into the inner workings of the data.

  - Tableau will be taught with a combination of tutorials that I created. I will also provide supplemental Tableau Desktop Training videos available in Blackboard.
- Microsoft Excel
  - Office 365 is available for *free* download via the GoStockton Portal.
  - Excel will be used primarily to look at your raw data, compute summary statistics, and inputting data. At the beginning of the course we will use Excel to create visualizations, but as the course progresses we will transition completely to Tableau and R for our visualization purposes.

Tentative Software:

- R/RStudio
  - RStudio is available for free download via the RStudio website.
  - Depending on course progression, I plan to teach a superficial introduction to data visualization using R. This is an industry standard for statisticians and data scientists; to command even a basic understanding of R will differentiate you from other business analysts in the job market.
- InkScape
  - A free alternative to Adobe Illustrator. Download link here.
  - Essentially a PDF editor. Once a visualization is saved via PDF, it can be imported into InkScape to add commentary, serving as the storytelling component of the visualization.

Learning Objectives:

- This is the first course with a comprehensive overview of the fundamental concepts and tools of business analytics for improving business decision making and performance. This is a hands-on course that is designed to introduce the principles and techniques for data visualization. Visualizations are graphical depictions of data that can improve comprehension, communication, and decision making. Students will learn visual representation methods and techniques that increase the understanding of complex data and models. Emphasis is placed on the identification of patterns, trends and differences from data sets across categories, space, and time.
- At the end of this course, you will be able to:
  - Collect and process data.
  - Create compelling and interactive visualizations.
  - Convey ideas, provide insight into a problem or situation, and ultimately tell a great data visualization story.
- Essential Learning Outcomes
  - Adapting to Change
  - Communication Skills
  - Creativity and Innovation
  - Information Literacy and Research Skills
  - Program Competence

Course Policies:

- Online attendance is **required**. By that I mean you should be fully interacting with the course material online in a timely manner.
- The online classroom is a learning community, with me as your guide and all of us as participants. As such, a community based on mutual respect requires expectations that I as a professor and you as a student should be able to have of each other.
- You can expect me to do the following:
    - Post online and respond online on time and be available by email to respond to your questions.
    - Prepare online materials for the class.
    - Return tests and other assignments in a timely fashion.
    - Be respectful and attentive when you communicate with me.
    - Treat you with respect and impartiality.
    - Tell you if I don't know the answer. I will make every effort to find out what the answer might be.
    - Give you prior notice of any changes made in the syllabus, this includes announcing any changes in class and "flagging" new items on the electronic syllabus.
    - Keep dates as described in the syllabus, although the subject material may be re-arranged. No new assignments or quizzes will be added.
- I expect you to do the following:
    - Trust my professional and professorial judgment on academic matters and grading.
    - Interact enthusiastically online.
    - Be prepared.
    - Turn in assignments on time and done in an appropriate manner. I reserve the right to deduct points or refuse to grade work that was turned in late or done inappropriately. This is done to be fair to those students who did their work in the agreed upon fashion (see 'late assignment policy' below).
    - Be respectful and attentive when I communicate with you.
    - Treat each other with respect.
    - Give me prior notice of events in your life that you think may affect your academic performance.

Late Submission Policy:

- Late submissions are permitted. However, 25% of the total possible assignment score will be deducted from the student's assignment grade each day after the due date until assignment submission or the assignment grade drops to 0.

Communication:

- We will be using the Blackboard Discussion Board for asking and answering questions as a class. Students are able to post questions anonymously. I want to establish an environment of collaborative help, which would not be possible if questions and concerns were only sent to my email inbox.
- If you have a private concern or a question that is unfit for a public forum like Blackboard, I will respond to email within 4 - 8 hours (unless there is an extreme circumstance in my life). Don't hesitate to reach out to me with questions or concerns.

Mid-Term Appointments:

- I would like to meet everyone in person again on campus beginning the week of 10/15 for about 10-15 minutes each, either individually or in a group if you know others in the class. This is optional, but will allow me to help everyone out by obtaining feedback on the course at that point in the semester.
- This also serves as an opportunity for professional development. I would be more than happy to look at your resume, LinkedIn, website/blog, etc to help you increase your marketability.

Evaluation:

The final course grade will be calculated using the following categories:

Assessment	Percentage of Final Grade
Assignments/Labs	40%
Final Project	30%
Blackboard Quizzes	20%
Discussion Board	10%

The Stockton University bulletin discusses grading below:

"Grades represent the professional judgment of a faculty member on a student's academic performance in a particular instructional experience. A grade of A symbolizes excellent work, grades in the B range symbolize good work, grades of C+ and C symbolize satisfactory work, grades of C- and in the D range symbolize poor work, and an F symbolizes failure."

Specifically, the grading scale will depend in part on my assessment of the difficulty of the above graded material and following an evaluation of a class grade distribution plot, but will typically conform to the usual 100-90, 89-80, 79-70, 69-60 ranges for the A, B, C and D grades, respectively.

Assignments/Labs:

- Tableau workbook submissions and a brief (half page to one full page) write up about how you applied the concepts learned in the Knaflic textbook to your Tableau visualizations.
- Assignments can also be a one full page write up about a required blog post reading of my selection.

Blackboard Quizzes:

- Weekly blackboard quizzes (mix of multiple choice, fill in the blanks, true/false, and short answer response) of the weekly chapter readings in the Knaflic text and the assignment content, such as Tableau material.
- Question point breakdown
    - Short answer response: 3 points.
    - Multiple choice, fill in the blanks: 2 points.

    - True/false: 1 point.
- Each quiz has an arbitrary number of questions based on the content of the week, but the typical quiz will have between 10 – 15 questions.

Discussion Board: Must write an original response AND comment on someone else's post each week

- An original response should be 200+ words and shows critical thought regarding the topic. Original responses will be graded on a 10-point scale with 10 points indicating excellent, 9 indicating good, 8 indicating satisfactory, 7 indicating poor and 0 indicating failure. Responses are not just summarizing the reading but giving me your thoughts on it. I already read the book/chapters; I'm interested in hearing your thoughts about it and how you can apply the knowledge to the assignments/labs.
- Comments must be at least 100 words and also shows critical thought regarding the topic. Comments will be graded on a 5-point scale, with 5 points indicating excellent, 4 indicating good, 3 indicating satisfactory, 2 indicating poor and 0-1 indicating failure.

Final Project: Due 12/12/2018

- Build a Tableau dashboard that tells a compelling data story from a dataset of your choosing.
    - Technical requirements, if any, are TBD.
- Post this dashboard to your professional website/blog in a blog post that elaborates on:
    - The data source.
    - Any data cleaning, if applicable.
    - The dataset significance.
    - Rationale for chosen visualizations.
    - Employed data visualization best practices.
- The above items are subject to change and/or specification based on course progression.

Academic Dishonesty:

- Collaboration is important part of learning. However, your written work, such as discussion board posts, assignments/labs, and your final project must be your own original work. Quizzes may NOT be taken together, only individually. Quizzes taken together will result in a grade of 0 for all students involved. Handing in someone else work as your own is also cheating. Plagiarism will result in a grade of zero for the particular graded work. Please review the university's academic honesty policy available on the Academic Affairs website. All incidents of academic dishonesty will be reported to the Office of the Provost as required by university policy.

Disability Services:

- Students with disabilities who may require disability related accommodations for this course are encouraged to consult with Stockton University's Learning Access Program, located in J-204. Students can also call 652-4988. Additional information may be obtained from the Learning Access Program Stockton webpage.

Blogs:

- FlowingData
- sokolj.com (my website/blog for reference)
- PlayFair Data | Best Dashboard Practices
- from data to viz

Useful Links:

- The Do's and Don'ts of Dashboards
- Embed Tableau Public on your Website
- Minimal Mistakes

Additional Links will be posted in the 'Blogs' and 'Useful Links' folders on Blackboard as the semester progresses.

Data Science & Strategic Analytics Program:

- Self-standing master's program (30 credits, can be completed in one full calendar year full time).
- Promotional video that explains 'what is data science?' and the opportunities the degree can provide.
- Stockton webpage for more information.
- If you have any questions about the program, don't hesitate to reach out to me!

DataCamp:

- Online learning platform for data science.
- 162 (and growing) Data Science instructional videos teaching R, Python, statistics, Linux.
- Usually $30 a month for non-students, but I will sign up the class after the add/drop period ends. Everyone has access to all content for free for 6 months (until about 2/12/2018).
- Completely optional, but for those interested a great opportunity to become exposed to data science at no charge.

Course Schedule (subject to change):

Week	Start Date	Assigned Readings/Content	Assignments Due
1	9/10	• Chapter 1 - The importance of context • No Excel/Tableau content	• Quiz #1 and Discussion Board due 9/17
2	9/17	• Chapter 2 - Choosing an effective visual • Creating visualizations in Excel	• Assignment 1, Quiz #2 and Discussion Board due 9/24
3	9/24	• Chapter 3: Clutter is your enemy! • Introduction to Tableau	• Assignment 2, Quiz #3 and Discussion Board due 10/1
4	10/1	• Chapter 4: Focus your audience's attention • Tableau line graphs	• Assignment 3, Quiz #4 due and Discussion Board due 10/8
5	10/8	• Chapter 5: Think like a designer • Tableau bar graphs	• Assignment 4, Quiz #5 and Discussion Board due 10/15
6	10/15	• Chapter 6: Dissecting model visuals • No new Tableau content	• Quiz #6 due 10/22 • ****No Assignment or Discussion Board****
7	10/22	• Chapter 7: Lessons in storytelling • Pie chart vs. tree maps, and geospatial data	• Assignment 5, Quiz #7 and Discussion Board due 10/29
8	10/29	• Chapter 8: Pulling it all together • Dashboard design	• Assignment 6, Quiz #8 and Discussion Board due 11/5
9	11/5	• Chapter 9: Case Studies • Tableau formatting	• Assignment 7, Quiz #9 and Discussion Board due 11/12
10	11/12	• Chapter 10: Final Thoughts • Tableau Calculated Fields • Introduction to R, time permitting	• Assignment 8, Quiz #10 and Discussion Board due 11/19
11	11/19	Work on Final Project–Thanksgiving week	• Discussion board elaborating on Final Project due 11/26
12	11/26	Work on Final Project	• Final Project due 12/12
13	12/03	Work on Final Project	• Final Project due 12/12
14	12/10	Final Project Due 12/12	• Final Project due 12/12