

Data Storytelling and Visualization

Spring 2018

Course number: MMC6936

Credits: 4

Instructor: Chad Skelton

Email: chad.skelton@jou.ufl.edu

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Office Hours: I will make myself available for office hours by appointment. Please email me to schedule a meeting.

Course Website: <http://lss.at.ufl.edu>

Course Communication: If your question is of a general nature that you think fellow students may also have, please ask your question in the General Questions discussion forum — that way your fellow students can benefit from the answer. If your question is of a personal nature, please email me.

Course Description:

This course will cover the fundamentals of effective data-driven storytelling. Students will learn how to detect and articulate the stories behind data sets and communicate data findings in visual, oral, and written contexts for various audiences and publics. Students will become familiar with associated tools.

Course Objectives:

By the end of this course, students will be able to:

- Detect and understand the stories within datasets and extract insights from that data.
- Effectively present data visually to enhance audience comprehension of findings and insights.
- Apply data visualization best practices to their work, including choosing the right chart type for the situation and avoiding visualization techniques that can mislead an audience.

- Act as a data-driven visual storyteller for optimal presentation of trends, patterns and insights.
- Effectively communicate insights about data in various formats, including oral presentations, written reports and interactive visualizations.
- Prepare professional business reports and make effective client presentations of their work.
- Find and download public data from open data portals such as data.gov and data.un.org.
- Analyze datasets visually using Tableau Desktop.
- Create static charts, interactive Dashboards and data stories using Tableau Desktop.
- Explain the importance of communication skills and competencies for individuals who serve as data analysts.

Course Goal:

This course teaches students the skills necessary to be effective Data Storytellers. They will learn how to locate and download datasets, extract insights from that data and present their findings in a variety of different formats. Students will learn how to “connect the dots” in a dataset through visual data analysis and find the narrative thread that both explains what’s going on and engages their audience in a story about the data. Moreover, students will learn how to tell data stories in different ways for different audiences and stakeholders.

Expectations:

Students are expected to complete all assigned readings and recorded lectures, to submit their assignments on time and to participate in class discussions in a professional manner while respecting the instructor and fellow students.

Required Texts:

- **Storytelling with Data: A Data Visualization Guide for Business Professionals** by Cole Nussbaumer Knaflic (ISBN: 9781119002253)

- **Tableau Your Data!: Fast and Easy Visual Analysis with Tableau Software** (1st or 2nd Edition) By Daniel Murray (ISBN: 9781119001195)
- Selected readings (i.e. chapters from other books) will be made available through the Course Reserves system of the UF Libraries in Canvas. **Note:** Access to the Course Reserves system (ARES) can be browser-sensitive. If you have Internet Explorer (IE) Edge or later, it may not open. We recommend an older version than Edge, or use Mozilla or Chrome.

Both **Storytelling with Data** and **Tableau Your Data!** are available in electronic format for free through the UFL library:

<http://cms.uflib.ufl.edu/>

If you wish to purchase paper copies of either book, you can find them on Amazon.com at:

<https://www.amazon.com/Storytelling-Data-Visualization-Business-Professionals/dp/1119002257/>

<https://www.amazon.com/Tableau-Your-Data-Analysis-Software/dp/1119001196/>

Required Software and Hardware:

- **Tableau Desktop** (a free academic license is available to UF students at <https://www.tableau.com/academic/students>)
- **PowerPoint**
- A **webcam** (to record assignments)
- A **computer microphone** (to record assignments; a built-in laptop mic is fine)

Additional Readings:

Listed in the course schedule and in each weekly module on Canvas

Prerequisite knowledge and skills:

Students are expected to have a basic familiarity with Excel and with the concept of structured data (i.e. storing data in columns and rows).

Teaching Philosophy:

The instructor believes that hands-on learning is the most effective way to learn data storytelling and visualization skills. While students will be given a strong foundation in data visualization principles through various readings, lectures will be focused on concrete skills that students will then implement in their own work.

Instructional Methods:

Each week, there will be several recorded lectures, readings and video presentations from other sources. **I recommend you watch the lectures first.** That's because, in some cases, the readings will reinforce the lessons in the lectures and — depending on how comfortable you feel with what was taught in the lectures — you may be able to skim some sections of the readings. This is particularly true for readings from **Tableau Your Data!**, which is provided to students primarily as a reference work and whose material will often reinforce similar skills as will be covered in the recorded lectures.

To encourage productive class discussions, it is essential that all students keep up with the recorded lectures, readings and videos assigned in this class each week. With that in mind, each week, you will be required to complete a short online quiz that will be based on those assigned readings, lectures and videos.

All students will be expected to participate each week in the online discussion boards (more details below).

Course Policies:

Attendance Policy:

Because this is an online asynchronously delivered course, attendance in the form of calling roll will not occur; however, students are expected to sign onto the course site at least once each day, Monday – Friday, to check for course updates in the announcements and discussion sections of the site.

Late Work and Make-up Policy:

Deadlines are critical to this class. All work is due on or before the due date. Extensions will only be granted in exceptional circumstances (i.e. serious illness, death of a close family member) and may require proof (like a doctor's note). Requests for extensions, whenever possible, should be made well in advance of the assigned due date. Minor inconveniences such as family vacation or minor illness are not valid reasons for extensions. With that in mind, there will be penalties for late work:

- | | |
|-------------------------------------------------|--------------------------|
| • Less than an hour late | 10 percentage points off |
| • More than an hour but less than 48 hours late | 25 percentage points off |
| • More than 48 hours late | 50 percentage points off |
| • A week or more late | Not accepted at all |

Please note that all late penalties are in **percentage points**, not percentages. That means an assignment that would normally get 80% handed in five days late would get 30% (80% minus 50 percentage points) not 40% (half of 80%).

Each new lecture week begins on Mondays and ends on Sundays.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalogue at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Coursework:

Coursework should be submitted through Canvas.

Deadlines:

Each week's module begins on Monday morning. All discussion board posts, quizzes and assignments for that week are due before 11:59pm Eastern Standard Time on the following Sunday, with the exception of discussion board replies, which are due the Tuesday after that.

Issues with uploading work for a grade is not an excuse. If a student is having technical difficulties with Canvas, there are other means to submit completed work. Student may email .zip files or even links to Dropbox folders to Instructor via UF email. Students should compensate for technical difficulties by not waiting until the last minute to submit work.

Suggested technical issue policy: Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up. Contact UF helpdesk (352) 392-HELP.

Emergency and extenuating circumstances policy: Students who face emergencies, such as a major personal medical issue, a death in the family, serious illness of a family member, or other situations beyond their control should notify their instructors immediately.

Students are also advised to contact the Dean of Students Office if they would like more information on the medical withdrawal or drop process:
<https://www.dso.ufl.edu/care/medical-withdrawal-process/> .

Students MUST inform their academic advisor before dropping a course, whether for medical or non-medical reasons. Your advisor will assist with notifying professors and go over options for how to proceed with their classes. Your academic advisor is Tiffany Robbert, and she may be reached at trobbert@jou.ufl.edu .

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalogue at:
<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Grading:

Your work will be evaluated according to this distribution:

- Discussions (12 Total) 20%
- Weekly Quizzes (11 total) 10%
- Assignments
 - Data Plan 10%
 - Two charts, a “lead” and an “elevator pitch” 10%
 - Narrated PowerPoint Slide Deck 15%
 - Data Memo (Written Report) 15%
 - Interactive Data Story 20%

The final grade will be awarded as follows:

A	100%	to	92.5%
A-	< 92.5%	to	89.5%
B+	< 89.5%	to	86.5%
B	< 86.5%	to	82.5%
B-	< 82.5%	to	79.5%
C+	< 79.5%	to	76.5%
C	< 76.5%	to	72.5%
C-	< 72.5%	to	69.5%
D+	< 69.5%	to	66.5%
D	< 66.5%	to	62.5%
D-	< 62.5%	to	59.5%
F	< 59.5%	to	0%

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Weekly Lectures:

The Instructor will post lecture videos to Canvas for each of the 12 weeks of the course and two additional videos – one is an introduction to the course and course topic and the other will cover the syllabus. These videos will vary in length depending on the material. It is your responsibility to watch each of the videos.

Assignments:

Weekly Quizzes (10% of Final Grade)

Each week, you will be required to complete a short online quiz that will be based on that week's assigned lectures and readings.

Each quiz will contain five multiple choice and true/false questions and will have a time limit of 10 minutes. The quiz is open book but is recommended you do the quiz only after you have watched all of that week's lectures and done all the assigned readings.

The quiz will be due at 11:59pm Eastern time on the Sunday of each weekly module.

Discussions (20% of Final Grade)

All students will be expected to participate each week in the online discussion boards. Each week's discussion question or topic will be posted on Canvas on the Monday of each weekly module. Your initial post responding to that question should be posted in Canvas no later than 11:59pm Eastern time on Sunday. However, any replies to other students' posts are not due until 11:59 pm Eastern time on the following Tuesday (to allow a bit of extra time for replies). So, for example, your post in response to a question in Week 2 is due that Sunday but your replies to other students' Week 2 posts are not due until the Tuesday of Week 3.

As a general rule, the instructor will refrain from commenting on a students' discussion post until at least one other student has done so first. The hope is this will encourage students to think critically about each others' work rather than waiting to first see what the "right" answer is from the instructor.

The discussions will fall into one of the three broad areas:

- Answering discussion questions posed by the instructor, inspired by that week's readings and lectures. You will be required to post an answer to the instructor's question, in roughly 250 words, as well as respond to at least two of your fellow students' posts. Your replies should be roughly 150 words each. You are free to contribute more responses if you wish.

- Providing feedback on fellow students' assignments-in-progress. For example, you may be expected to share one of the charts from your Narrated PowerPoint Slide Deck the week before the assignment is due and then comment on at least two of your fellow students' charts. These comments should be at least 150 words in length.
- Mini-assignments, such as finding a chart online and writing a brief critique of it or participating in "Makeover Monday", in which participants take an existing chart and redesign it using Tableau. In the case of mini-assignments, you will be expected to both post your own assignment and respond to at least one of your fellow student's assignments. Word counts for the mini-assignments will vary and will be included when assigned.

Data Plan (10% of final grade)

Your Data Plan should be submitted through Canvas as a Word document (**.doc** or **.docx**).

Find a dataset that will serve as the basis for the other assignments in this course (Narrated PowerPoint Slide Deck, Data Memo and Interactive Data Story). This dataset can be located on an open data portal or can be a dataset that you have access to through your work. The dataset can be on any topic you choose — ideally, pick one that's about something you're interested in and/or is about where you live. This will make it a lot more interesting to complete the assignments in this course.

Write a brief (500 word maximum) report that includes the following questions, and your answers to them:

1. What dataset will you use for your final report? (describe your dataset, and either include a link to where I can find it online or submit it as a spreadsheet along with your report).
2. Describe the dataset. What kind of data does it contain?

3. Is there anything about your data that you don't understand? (i.e. what a column heading means). How will you find this out?
4. What are some questions you hope to answer with your data? List at least three (you don't need the answers to the questions at this point).

Some things to keep in mind about this assignment:

- Review the requirements for the other assignments in this course carefully to ensure that the dataset you choose is rich enough to allow you to do detailed, in-depth analysis on it for the remainder of this course. Generally speaking, “summary data” that is only a few dozen rows long is probably not sufficient. Raw data (hundreds or thousands of rows) is better.
- That said, you should generally try to avoid data that is **too** big. Most newer versions of Excel can't open files that are much bigger than a million rows. Tableau technically can open files that are 10 million rows or larger but, in practice, working with files that big will slow down your machine. For that reason, a good rule of thumb is that you should pick a dataset that is **less than a million rows**.
- As you progress through the course, if you find your dataset is not detailed enough to properly complete future assignments, you will have the option to supplement it with additional, related datasets. For example, if your original dataset was on measles outbreaks in your area, you could supplement it with school-level statistics on vaccination rates.
- The dataset you choose should be **raw data in spreadsheet format** (XLS, XLSX, CSV). It should **NOT** be a website with an online map or chart on it. You need to be able to access the raw data for this project so you can create your own interactive chart.
- If the dataset you choose is from a specialized area (i.e. medicine, science, economics), make sure you explain it in a way that someone who doesn't know anything about the topic – including your fellow students and me — can understand what you're talking about. In particular, I don't know anything about sports, so make sure you explain any sports statistics in

simple terms a non-sports-fan could understand.

- If, in answering the questions above, you realize that the data you have is too complicated or you don't understand it properly, the best thing to do is to pick another dataset. Choosing an overly complex dataset will just make the project more difficult and increase the risk of serious errors later.

Rubric

	90-100 Excellent	80-89 Good	Less than 80 Unsatisfactory
Dataset – 25%	The dataset selected meets or exceeds all of the requirements outlined in the assignment.	The dataset selected meets most of the requirements outlined in the assignment but has some flaws.	The dataset selected is not appropriate for the assignment.
Description – 25%	The description of the dataset clearly and fully explains what the dataset contains.	The description of the dataset does a good job of describing the dataset but leaves some important things out.	The description of the dataset does not do a good job of explaining what the dataset contains.
Limitations – 10%	The limitations of the dataset are clearly and thoroughly explained.	The limitations of the dataset are partially explained, with some limitations not identified.	The limitations of the dataset are not well explained.
Questions – 30%	All the questions posed of the dataset are well thought out and answerable from the dataset.	At least two of the questions posed of the dataset are well thought out and answerable from the dataset.	One or fewer of the questions posed of the dataset are well thought out and answerable from the dataset.
Writing – 10%	The assignment is very well-written, with proper grammar, punctuation and spelling.	The assignment is relatively well-written, with a few grammar, punctuation and spelling errors that do not impede overall understanding.	The assignment is not well-written and there are several grammar, punctuation and spelling errors that may disrupt understanding.

Two charts, a “lead” and an “elevator pitch” (10% of final grade)

The charts for this assignment, along with the lead, should be submitted through Canvas as a Word document (**.doc** or **.docx**). The charts should be pasted into the Word document rather than submitted separately as image files. The elevator pitch should be submitted as a YouTube video. The URL for that video should then be pasted into the Word document. (If you’re using a proprietary dataset for your assignment, you can arrange with the instructor to instead upload your video file directly to Canvas.)

This assignment will show the results of your initial analysis of your dataset. It should include:

1. A single sentence identifying the most interesting thing you’ve discovered in your dataset, much like the “lead” of a news story. This “lead” should intrigue the reader and make them want to learn more.
2. Two static charts, created using Tableau, that illustrate key insights you’ve discovered in your data. At least one of your two charts should support the statement made in your lead sentence.
3. To accompany the charts and lead sentence, an “elevator pitch” of 30-45 seconds in which you are seen on camera explaining why the insights you’ve discovered are worth paying attention to. For your elevator pitch, there should be nothing on camera except yourself (i.e. no slides, no charts). You should wear business-appropriate clothing (i.e. no sweatpants, shorts or jeans) and be seated in an office-style setting or standing up (i.e. no lounging on the couch).

Some things to keep in mind:

- Make sure your charts have clear, engaging titles that contain the “takeaway” message you want your reader to have rather than a dry, technical description of what the charts are visualizing.

- Review the Data Visualization Best Practices discussed in class and make sure your charts are following those guidelines.
- Show your charts to someone unfamiliar with the data (like a friend or family member) and see if they can understand what you're trying to say.
- If you're recording your elevator pitch on your smartphone, hold your phone horizontally rather than the usual vertical orientation, so that your video won't have black bars on the sides when you upload it to YouTube.

Rubric

	90-100 Excellent	80-89 Good	Less than 80 Unsatisfactory
Two Charts – 35%	The two charts clearly illustrate key insights from the student's dataset and follow the Data Visualization Best Practices discussed in class.	The two charts illustrate some insights from the student's dataset and follow most of the Data Visualization Best Practices discussed in class.	The two charts do not illustrate key insights from the student's dataset and/or do not follow the Data Visualization Best Practices discussed in class.
Lead Sentence – 30%	The lead sentence clearly and concisely illustrates the most interesting thing in the student's dataset in a way that makes the reader want to learn more.	The lead sentence illustrates something interesting in the dataset but is not written as clearly and concisely as it could be.	The lead sentence does not do a good job of identifying something interesting in the dataset and/or does not make the reader want to know more.
Elevator Pitch – 35%	The elevator pitch demonstrates superior oral presentation skills, getting the viewer excited about the dataset and engaged in the topic.	The elevator pitch demonstrates solid oral presentation skills, though there is some room for improvement.	The elevator pitch does not demonstrate good oral presentation skills. The message is unclear and/or hard to follow.

Narrated PowerPoint Slide Deck (15%)

You will produce a short PowerPoint slide deck explaining some key findings about your data and a clear recommendation about what action should be taken as a result of your analysis. You will then narrate that slide deck to produce a recorded presentation **between 10 and 15 minutes** long. The PowerPoint file (**.pptx**), with your narration attached, should be submitted in Canvas.

Your presentation should include:

- Between 10 and 15 slides.
- The charts in your slide can include those from the previous assignment. If so, make sure you incorporate any feedback you received — from the instructor and your fellow students — about how to make those charts better.
- Your first slide, which will appear on screen before your narration begins, should identify who the **audience** for your presentation is. In most cases, you should envision your audience as the head of an organization that you work for (i.e. a business, a government agency, a charity) that needs to make a decision based on your analysis.
- Your presentation should include **at least four static charts** that you've created in Tableau based on your data, though you can include more charts if you wish.
- Your slides should include **some visual elements other than static charts** that help illustrate your points and maintain viewer interest (i.e. photographs, clip art, etc.)

Some things to keep in mind about this assignment:

- Remember that people may be viewing your presentation from the back of a room. Make sure everything is **big enough** for people to see.

- Your presentation should be more than you just **reading your slides**. Instead, your slides should be relatively minimalist, showing key images, key ideas or key charts that you then enrich with your oral presentation.
- You can find instructions for how to turn your PowerPoint slides into a narrated presentation here: <https://support.office.com/en-us/article/Record-a-slide-show-with-narration-and-slide-timings-0b9502c6-5f6c-40ae-b1e7-e47d8741161c>

Rubric

	90-100 Excellent	80-89 Good	Less than 80 Unsatisfactory
Slide Number and Length – 20%	The presentation has between 10 and 15 slides, is between 10 and 15 minutes long and has at least four charts.	The presentation is too short or too long but only by a couple of slides or a couple of minutes.	The presentation is significantly longer or shorter than it should be and/or does not have the required number of charts.
Charts – 25%	The charts used in the presentation clearly illustrate key insights from the student's dataset and follow the Data Visualization Best Practices discussed in class.	The charts illustrate some insights from the student's dataset and follow most of the Data Visualization Best Practices discussed in class.	The charts do not illustrate key insights from the student's dataset and/or do not follow the Data Visualization Best Practices discussed in class.
Other Visuals – 10%	The other visuals used in the presentation (clip art, photographs) are well chosen and help communicate the presentation's key points.	The other visuals used in the presentation (clip art, photographs) are OK but there is room for some improvement.	The other visuals used in the presentation (clip art, photographs) are not well chosen or are missing altogether.
Ideas and Insight – 25%	The presentation makes clear, compelling points derived from the student's data analysis and makes a clear recommendation appropriate for the	The presentation is reasonably clear and compelling, but could be made more so.	The insights and ideas of the presentation are not clear and/or are poorly presented.

	intended audience.		
Oral Presentation – 20%	The oral presentation of the material is clear and engaging. The presenter speaks at a good pace and key points are made effectively.	The oral presentation of the material is reasonably clear and engaging, but there is some room for improvement.	The oral presentation of the material is ineffective.

Data Memo (Written Report) (15%)

Your Data Memo will be submitted through Canvas as a Word document (**.doc** or **.docx**).

You will write a “Data Memo” outlining the key findings of your data analysis as well as suggestions for how your intended audience should respond to your findings. This assignment will build on the findings in your Narrated PowerPoint Slide Deck, exploring them in greater depth.

Your Data Memo should:

- Be **between 1,500 and 2,000 words long**.
- Written as if it were addressed to your intended audience (i.e. the CEO or manager of the organization).
- Include **at least six (and no more than 10) static charts**. The charts in your report can include those from previous assignments. If so, make sure you incorporate any feedback you received — from the instructor and your fellow students — about how to make those charts better.
- At the top of your first page, include a brief description of who the **intended audience** for your Data Memo is.
- Reference **at least six outside sources** (studies, news articles, reports) that put your data into **context**. For example, if you have data about vaccination

rates at local schools, an outside source could be a study examining what rate of vaccination is required for “herd immunity”.

- For all outside sources used, you should briefly summarize what the outside source says, explain how it’s relevant to your data, and include a hyperlink to where the source can be found online (you can create hyperlinks in Word by highlighting the text and then pressing CTRL-K/CMD-K).
- Your report should include a **clear recommendation** for your audience of what steps they should take in response to your analysis. Base this suggestion on who your intended audience is and what they are in a position to do in response to your analysis. For example, a CEO could hire more staff. An advocacy group could create a new awareness campaign.

Rubric

	90-100 Excellent	80-89 Good	Less than 80 Unsatisfactory
Length Requirements – 20%	The Data Memo is between 1,500 and 2,000 words and has at least six charts.	The Data Memo is too short or too long but only by a few hundred words and/or there are four or five charts in the report.	The Data Memo is significantly longer or shorter than it should be and/or it falls well short of the number of required charts.
Writing – 20%	The assignment is very well-written, with proper grammar, punctuation and spelling.	The assignment is relatively well-written, with a few grammar, punctuation and spelling errors that do not impede overall understanding.	The assignment is not well-written and there are several grammar, punctuation and spelling errors that may disrupt understanding.
Ideas and Insight – 20%	The Data Memo makes clear, compelling points derived from the student’s data analysis and makes a clear recommendation appropriate for the	The Data Memo is reasonably clear and compelling, but could be made more so.	The insights and ideas of the Data Memo are not clear and/or are poorly presented.

	intended audience.		
Charts – 20%	The charts used in the Data Memo clearly illustrate key insights from the student’s dataset and follow the Data Visualization Best Practices discussed in class.	The charts illustrate some insights from the student’s dataset and follow most of the Data Visualization Best Practices discussed in class.	The charts do not illustrate key insights from the student’s dataset and/or do not follow the Data Visualization Best Practices discussed in class.
Outside Sources – 20%	The Memo refers to at least six outside sources that are well summarized and effectively put the data into additional context.	The outside sources referenced in the report are adequately summarized and put the data in some context but the sources could have been chosen with more care.	The outside sources referenced in the report do a poor job of putting the data into additional context and/or there are not enough outside sources cited.

Interactive Data Story (20%)

Using Tableau, you will create a “Data Story” that uses interactive maps and/or charts to explain the results of your data analysis and anticipates the viewer’s questions about your data.

Your Data Story should be submitted through Canvas as a Tableau Packaged Workbook (.twbx) file **NOT** a Tableau Workbook (.twb) file.

Your Data Story should:

- Include **at least five “Story Points”** (and no more than 10) that tell a data story in sequence using Tableau’s built-in navigation bar.
- Each Story Point should include **at least one chart or map**, but can also include other elements such as **images, videos, audio recordings** and **text**. Multiple Story Points can use the same chart if you want to focus on different elements of your data (i.e. highlight different lines on a line chart, showing progression over time). However, the Data Story should include **at**

least three unique data visualizations (i.e. the whole Data Story shouldn't just be one chart with different filters applied).

- The charts in your Data Story can include those from previous assignments. If so, make sure you incorporate any feedback you received — from the instructor and your fellow students — about how to make those charts better.
- At least one Story Point should include a map or chart that can be **altered by the user using a Filter or Highlighter**.
- The dimensions of the Data Story should be **no larger than 1000 x 800 pixels** (the default for “Desktop Browser”), but can be smaller if you wish. NOTE: The default “Story” dimensions (1016 x 964) are larger than this but too big for viewing properly on most laptop screens.
- Any “static charts” in your Data Story should take advantage of **tooltips**, so users can learn more about a given data point.

Rubric

	90-100 Excellent	80-89 Good	Less than 80 Unsatisfactory
Basic Requirements – 15%	The Data Story has at least five Story Points, and there is a chart or map on each one. At least three unique charts/maps are used in the Data Story.	The Data Story is too short or too long but not by much and/or a chart/map is missing from a single Story Point.	The Data Story is significantly longer or shorter than it should be and/or it fails to include charts on several Story Points.
Ideas and Insight – 25%	The Data Story makes clear, compelling points derived from the student's data analysis.	The Data Story is reasonably clear and compelling, but could be made more so.	The insights and ideas of the Data Story are not clear and/or are poorly presented.
Charts – 25%	The charts used in the Data Story clearly illustrate key insights from the student's dataset and follow the Data Visualization Best Practices discussed in	The charts illustrate some insights from the student's dataset and follow most of the Data Visualization Best Practices discussed in class.	The charts do not illustrate key insights from the student's dataset and/or do not follow the Data Visualization Best Practices discussed in

	class.		class.
Anticipating Questions – 35%	The Data Story, in particular any charts that permit Filtering or Highlighting, do a good job of anticipating the questions a viewer may have about the data and makes answering those questions possible.	The Data Story has some interactivity that permits the user to answer their own questions but it is not implemented as effectively as it could be.	The Data Story does not permit the user to answer their own questions through Filtering or Highlighting or it is done so poorly as to make it impossible for the user to answer their own questions about the data.

University Policies

University Policy on Accommodating Students with Disabilities:

Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

Students with Disabilities who may need accommodations in this class are encouraged to notify the instructor and contact the Disability Resource Center (DRC) so that reasonable accommodations may be implemented. DRC is located in room 001 in Reid Hall or you can contact them by phone at 352-392-8565.

Netiquette: Communication Courtesy:

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

Class Demeanor:

Mastery in this class requires preparation, passion, and professionalism. Students are expected, within the requirements allowed by university policy, to attend class, be on time, and meet all deadlines. Work assigned in advance of class should be completed as directed. Full participation in online and live discussions, group projects, and small group activities is expected.

My role as instructor is to identify critical issues related to the course, direct you and teach relevant information, assign appropriate learning activities, create opportunities for assessing your performance, and communicate the outcomes of such assessments in a timely, informative, and professional way. Feedback is essential for you to have confidence that you have mastered the material and for me to determine that you are meeting all course requirements.

At all times it is expected you will welcome and respond professionally to assessment feedback, that you will treat your fellow students and me with respect, and that you will contribute to the success of the class as best as you can.

Other Resources:

Other are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
 - <http://www.counseling.ufl.edu/cwc/> 352-392-1575
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please contact your program director and/or student support coordinator at distancesupport@jou.ufl.edu or visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

Course Evaluation:

Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>

Evaluations are typically open during the last two or three weeks of the semester. Students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>

University Policy on Academic Misconduct:

Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>

The University of Florida Honor Code was voted on and passed by the Student Body in the fall 1995 semester. The Honor Code reads as follows:

Preamble: In adopting this Honor Code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the University community. Students who enroll at the University commit to holding themselves and their peers to the high standard of honor required by the Honor Code. Any individual who becomes aware of a violation of the Honor Code is bound by honor to take corrective action. A student-run Honor Court and faculty support are crucial to the success of the Honor Code. The quality of a University of Florida education is dependent upon the community acceptance and enforcement of the Honor Code.

The Honor Code: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied:

"On my honor, I have neither given nor received unauthorized aid in doing this assignment."

For more information about academic honesty, contact Student Judicial Affairs, P202 Peabody Hall, 352-392-1261.

Academic Honesty

All graduate students in the College of Journalism and Communications are expected to conduct themselves with the highest degree of integrity. It is the students' responsibility to ensure that they know and understand the requirements of every assignment. At a minimum, this includes avoiding the following:

Plagiarism: Plagiarism occurs when an individual presents the ideas or expressions of another as his or her own. Students must always credit others' ideas with accurate citations and must use quotation marks and citations when presenting the words of others. A thorough understanding of plagiarism is a precondition for admittance to graduate studies in the college.

Cheating: Cheating occurs when a student circumvents or ignores the rules that govern an academic assignment such as an exam or class paper. It can include using notes, in physical or electronic form, in an exam, submitting the work of another as one's own, or reusing a paper a student has composed for one class in another class. If a student is not sure about the rules that govern an assignment, it is the student's responsibility to ask for clarification from his instructor.

Misrepresenting Research Data: The integrity of data in mass communication research is a paramount issue for advancing knowledge and the credibility of our professions. For this reason any intentional misrepresentation of data, or misrepresentation of the conditions or circumstances of data collection, is considered a violation of academic integrity. Misrepresenting data is a clear violation of the rules and requirements of academic integrity and honesty.

Any violation of the above stated conditions is grounds for immediate dismissal from the program and will result in revocation of the degree if the degree previously has been awarded.

Students are expected to adhere to the University of Florida Code of Conduct <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>

If you have additional questions, please refer to the Online Graduate Program Student Handbook you received when you were admitted into the Program.

Schedule

Course Introduction:

Course Introduction Video:

- An introduction to the instructor.
- A brief overview of the purpose of the course and what you will learn.

Course Syllabus Video:

- Explanation of course requirements and assignments.

NOTE: Each weekly module begins on Monday and ends on Sunday. All assignments are due before 11:59pm Eastern time on the last day (Sunday) of that week's module. Discussion questions will be posted each Monday and your posts are due on Sunday. However, any replies to other students' posts are not due until the following Tuesday.

Major assignment deadlines:

Data Plan	Sunday, Jan. 28, 2018
Two charts, lead and elevator pitch	Sunday, Feb. 18, 2018
Narrated PowerPoint Slide Deck	Sunday, March 4, 2018
Data Memo (Written Report)	Sunday, March 18, 2018
Interactive Data Story	Wednesday, April 4, 2018 <i>NOTE: Due to religious holidays over the weekend, the final deadline is on a Wednesday rather than a Sunday.</i>

Week 1: Finding Data

Learning Objectives

- Why we visualize data
- How to ask questions of data

- What makes a good, rich dataset for analysis and visualization
- How to find datasets on Open Data portals

Watch:

- 1a - Why We Visualize Data
- 1b - Asking Questions of Data
- 1c - Finding a Great Dataset
- 1d - Beware of Inconsistent Data
- 1e - Open Data Portals - Part 1
- 1f - Open Data Portals - Part 2

Required Readings:

Data Points by Nathan Yau, Chapter 1 [Course Reserves]

The Functional Art by Alberto Cairo, Chapter 1 [Course Reserves]

Data + Design, Chapter 1: Basic Data Types

<https://infoactive.co/data-design/ch01.html>

“Data Visualization for Human Perception” by Stephen Few

<https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/data-visualization-for-human-perception>

“Resources to Find the Data You Need, 2016 Edition” by Nathan Yau

<http://flowingdata.com/2016/11/10/find-the-data-you-need-2016-edition/>

Optional Readings/Videos:

“Making data mean more through storytelling” by Ben Wellington [14m]

<https://www.youtube.com/watch?v=6xsvGYlxJok>

Week 2: Basic Data Analysis in Tableau

Learning Objectives

- Knowing Your Data
- The “Data Visualization Process”
- Tableau Basics: Dimensions, Measures
- The Tableau Workspace
- How to analyze structured data using Tableau

Watch:

- 2a - Know Your Data
- 2b - Data Visualization Process
- 2c - Quick Tips for Hands On Lectures
- 2d - The Tableau Workspace
- 2e - Your First Tableau Chart

Required Readings:

Tableau Your Data!, Chapter 1

Data + Design, Chapter 2: About Data Aggregation

<https://infoactive.co/data-design/ch01.html>

“What I learned recreating one chart using 24 tools” by Lisa Charlotte Rost

<https://source.opennews.org/en-US/articles/what-i-learned-recreating-one-chart-using-24-tools/>

“Find hidden insights in your data: Ask why and why again” by Andy Cotgreave

<http://www.tableau.com/about/blog/2016/11/find-hidden-insights-your-data-ask-why-and-why-62739>

“Using Data Visualization to Find Insights in Data” by Gregor Aisch

http://datadrivenjournalism.net/resources/using_data_visualization_to_find_insights_in_data

“Shorten the Visualization Path Back to Reality” by Nathan Yau

<http://flowingdata.com/2016/09/14/shorten-the-visualization-path-back-to-reality/>

Optional Readings/Videos:

“The Visual Design Tricks Behind Great Dashboards” by Andy Cotgreave
[56m]

<https://www.youtube.com/watch?v=4r1gr04UUJ8>

Related chart:

https://public.tableau.com/views/whichshouldiimplement/Whichdesignfeaturesshouldiimplement?:embed=y&:display_count=no&:showVizHome=no

“Boss, I Need a Bigger Screen. For Work Efficiency, of Course.” By Farhad Manjoo

<http://www.nytimes.com/2009/01/15/technology/personaltech/15basics.html>

“Discovering Two Screens Aren’t Better Than One.” By Farhad Manjoo
<https://www.nytimes.com/2014/03/20/technology/personaltech/surviving-and-thriving-in-a-one-monitor-world.html>

Week 3: Creating Static Charts in Tableau

Learning Objectives

- How to create simple static charts in Tableau (bar charts, line charts)
- Visualizing locations and time
- How to save and publish your data in Tableau
- How to export charts from Tableau for use in PowerPoint and Word

Watch:

3a - Your Second Tableau Chart

3b - More Tableau Charts
3c - Visualizing Locations
3d - Visualizing Time
3e - Saving and Publishing - Part 1
3f - Saving and Publishing - Part 2
3g - Exporting Tableau Charts

Required Readings:

Tableau Your Data!, Chapter 2

“Strong Titles Are The Biggest Bang for Your Buck” by Stephanie Evergreen
<http://stephanieevergreen.com/strong-titles/>

Assignments:

- **Data Plan is Due**

Week 4: Finding the Most Important Thing

Learning Objectives

- How to reshape data using Tableau
- Using “Measure Names” and “Measure Values” in Tableau
- How to identify the “most important thing” in your data
- How to write about numbers

Watch:

4a - Reshaping Data - Part 1
4b - Reshaping Data - Part 2
4c - Finding The Most Important Thing
4d - Writing About Numbers

“How to think like a data journalist” by Chad Skelton [30m]
<https://vimeo.com/180922380>

Required Readings:

Storytelling with Data, Chapter 1

Better Presentations by Jonathan Schwabish, Chapter 1 [Course Reserves]

“Spreadsheet Thinking vs. Database Thinking” by Robert Kosara

<https://eagereyes.org/basics/spreadsheet-thinking-vs-database-thinking>

Week 5: Choosing the Right Chart**Learning Objectives**

- Data Visualization Best Practices
- How to choose the right chart type for the job
- How to prepare your elevator pitch

Watch:

5a - Data Visualization Best Practices - Part 1

5b - Data Visualization Best Practices - Part 2

5c - Choosing the Right Chart

5d - Preparing Your Elevator Pitch

First, load this chart, press play at the bottom left and watch the data change from 1962 to 2015:

<http://bit.ly/roslinggap>

Then watch this TED Talk by Hans Rosling [20m]:

https://www.ted.com/talks/hans_rosling_shows_the_best_stats_you_ve_ever_seen#t-144054

Required Readings:

Storytelling with Data, Chapters 2 and 3

Data Points by Nathan Yau, Chapter 5 [Course Reserves]

Better Presentations by Jonathan Schwabish, Chapter 8 [Course Reserves]

“Chart Suggestions – A Thought-Starter” by Extreme Presentations
<http://extremepresentation.typepad.com/files/choosing-a-good-chart-09.pdf>

“Data Visualization Checklist” by Stephanie Evergreen and Ann Emery
http://stephanieevergreen.com/wp-content/uploads/2016/10/DataVizChecklist_May2016.pdf

“Real Chart Rules to Follow” by Nathan Yau
<http://flowingdata.com/2015/08/11/real-chart-rules-to-follow/>

“The self-sufficiency test” by Kaiser Fung
http://junkcharts.typepad.com/junk_charts/2005/10/the_selfsuffici.html

Optional Readings/Videos:

“The Competent Critic” by Alan Smith [21m]
https://www.youtube.com/watch?v=IB7crD_paKQ

“The Power of Drawing in Storytelling” by Catherine Madden [18m]
<https://www.youtube.com/watch?v=9ZDErtRixyc>

Data + Design, Chapter 14
<https://infoactive.co/data-design/ch14.html>

Data + Design, Chapter 17
<https://infoactive.co/data-design/ch17.html>

The Financial Times “Visual Vocabulary” (Click on headers)
<http://ft-interactive.github.io/visual-vocabulary/>

Week 6: The Power of Annotation

Learning Objectives

- How to join two datasets together in Tableau
- The importance of annotation and highlighting in data visualization.
- Using the “Highlighter” feature in Tableau.
- Adding reference lines to a visualization

Watch:

6a - Joining Datasets

6b - Blending Datasets

6c - Annotation and Highlighting - Part 1

6d - Annotation and Highlighting - Part 2

6e - Annotation and Highlighting - Part 3

6f - Reference Lines

“Potent Presentations: Design” (the second video on the page) [45m]:

<http://www.eval.org/p2i>

Required Readings:

Storytelling with Data, Chapter 4

Tableau Your Data!, Chapter 3

The Truthful Art by Alberto Cairo, Chapter 2 [Course Reserves]

“Putting Data Into Context” by Robert Kosara

<https://eagereyes.org/basics/putting-data-into-context>

Optional Readings/Videos:

The “Message” and “Delivery” videos on Potent Presentations:
<http://www.eval.org/p2i>

Various handouts and resources on the Potent Presentations website:
<http://www.eval.org/page/p2i-tools>

Assignments:

- **Two Charts, a “Lead” and an “Elevator Pitch” Due**

Week 7: More Chart Types

Learning Objectives

- More chart types and when to use them
- Treemaps vs. pie charts
- Stacked bar charts vs. area charts vs. grouped column charts.

Watch:

7a - Treemaps - Part 1
7b - Treemaps - Part 2
7c - Stacked Bar Charts
7d - Bullet Charts
7e - Histograms
7f - Highlight Tables

Part 1 of the Lynda.com course “Writing a Business Report” [25m]
<https://www.lynda.com/Business-Skills-tutorials/Welcome/157341/196688-4.html?org=ufl.edu>

Required Readings:

Storytelling with Data, Chapter 5

“Visual Analysis Best Practices” (Tableau Whitepaper)

https://www.tableau.com/sites/default/files/media/whitepaper_visual-analysis-guidebook_0.pdf

“Slopegraphs for comparing gradients: Slopegraph theory and practice” by Edward Tufte (don’t need to read comments)

https://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=0003nk

Optional Readings/Videos:

“Using Storytelling Patterns to Make Data Relatable” by Jessica Hullman [52m]

<https://www.youtube.com/watch?v=tjXsApA5Evs>

Week 8: Calculations

Learning Objectives

- The power of “small multiples”.
- How to use Table Calculations and Calculated Fields in Tableau to enrich your analysis.

Watch:

8a - Small Multiples

8b - Table Calculations - Part 1

8c - Table Calculations - Part 2

8d - Calculated Fields - Part 1

8e - Calculated Fields - Part 2

Part 2 of the Lynda.com course “Writing a Business Report” [35m]

<https://www.lynda.com/Business-Skills-tutorials/Welcom/157341/196688-4.html?org=ufl.edu>

Required Readings:

Storytelling with Data, Chapters 6 and 7

Tableau Your Data!, Chapter 4

The Functional Art, Chapter 3 [Course Reserves]

Assignments:

- **Narrated PowerPoint Slide Deck Due**

Optional Readings/Videos:

“Tableau Tip Tuesday: Table Calculations Overview” by Andy Kriebel (blog post and video)

<http://www.vizwiz.com/2017/02/table-calcs.html>

Opening Keynote at OpenVis 2013 by Amanda Cox [43m]

<https://www.youtube.com/watch?v=ha9LA3rYD9g>

Week 9: Maps

Learning Objectives

- The power of maps.
- The danger of maps (and why geographic data sometimes *shouldn't* be mapped).
- How to create point maps in Tableau.
- How to create shape maps in Tableau.
- How to create custom boundary maps in Tableau

Watch:

9a - When Not to Make a Map

9b - Point Maps

9c - Shape Maps
9d - Custom Boundary Maps

Part 3 of the Lynda.com course “Writing a Business Report” [50m]
<https://www.lynda.com/Business-Skills-tutorials/Welcome/157341/196688-4.html?org=ufl.edu>

Required Readings:

Storytelling with Data, Chapter 8

Tableau Your Data!, Chapter 5

“When Maps Shouldn’t Be Maps” by Matthew Ericson
<http://www.ericson.net/content/2011/10/when-maps-shouldnt-be-maps/>

“All Those Misleading Election Maps” by Robert Kosara
<https://eagereyes.org/blog/2016/all-those-misleading-election-maps>

“There Are Many Ways to Map Election Results. We’ve Tried Most of Them”
by The New York Times
<http://www.nytimes.com/interactive/2016/11/01/upshot/many-ways-to-map-election-results.html>

Week 10: Interactive Dashboards and Data Stories

Learning Objectives

- How to anticipate your user’s data questions.
- How to create interactive Dashboards in Tableau.
- How to create “Data Stories” in Tableau

Watch:

10a - Interactive Dashboards - Part 1

10b - Interactive Dashboards - Part 2
10c - Interactive Dashboards - Part 3
10d - Data Stories - Part 1
10e - Data Stories - Part 2
10f - Data Stories - Part 3

Required Readings:

Storytelling with Data, Chapters 9 and 10

Tableau Your Data!, Chapter 8

“Data Storytelling” by Robert Kosara (Tableau Whitepaper)

https://www.tableau.com/sites/default/files/media/whitepaper_datastorytelling.pdf

“A different way to think about ‘Data Storytelling’” by Chad Skelton

<http://www.chadskelton.com/2017/03/a-different-way-to-think-about-data.html>

Assignments:

- **Data Memo (Written Report) Due**

Optional Readings/Videos:

“Storytelling and Data: Why? How? When?” by Robert Kosara [31m]

<https://www.youtube.com/watch?v=PMtWFjjVM5E>

“An Examination of U.S. Gun Murders” [2m]

<https://www.youtube.com/watch?v=8R8UOjMy-5k>

[Interactive version: <http://guns.periscope.com/?year=2013>]

“Emotional Data Visualization: Periscope's ‘U.S. Gun Deaths’ and the Challenge of Uncertainty” by Alberto Cairo

<http://www.peachpit.com/articles/article.aspx?p=2036558>

Week 11: Data Visualization Research

Learning Objectives

- How to use advanced formatting features in Tableau.
- How to brand your Tableau charts to match your organization's colors, fonts and logo.
- What do we really know about data visualization? The state of data visualization research.

Watch:

11a - Formatting and Branding - Part 1

11b - Formatting and Branding - Part 2

"Everything we know about how humans interpret graphics" by Kennedy Elliot [23m]

<https://www.youtube.com/watch?v=s0J6EDvIN30>

Required Readings:

"Graphical Perception: Theory, Experimentation and Application to the Development of Graphical Methods" by William Cleveland and Robert McGill

http://www.math.pku.edu.cn/teachers/xirb/Courses/biostatistics/Biostatistics2016/GraphicalPerception_Jasa1984.pdf

"An Empire Built on Sand" by Robert Kosara

<http://kosara.net/papers/2016/Kosara-BELIV-2016.pdf>

"An Economist's Guide to Visualizing Data" by Jon Schwabish

<http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.28.1.209>

"Junk Charts Trifecta Checkup" by Kaiser Fung

http://junkcharts.typepad.com/junk_charts/junk-charts-trifecta-checkup-the-definitive-guide.html

Week 12: Next Steps and Tips

Learning Objectives

- How to get help when you run into a problem with Tableau
- How to learn more on your own about Tableau and Data Visualization.
- A review of online resources like blogs and online training videos.

Watch:

12a - Getting Help

“50 Tips in 50 Minutes” by Andy Kriebel and Jeff Shaffer [52m]

<https://www.youtube.com/watch?v=boJcT-lerFQ>

Required Readings:

Tableau Your Data!, Chapter 7

“The Future of Data Visualization” by Drew Skau

<http://www.tableau.com/about/blog/2012/04/guest-post-future-data-visualization-16578>

Assignments:

- **Interactive Data Story Due**

Optional Readings/Videos:

“Rapid Fire Tips & Tricks (and Bad Data Jokes)” by Daniel Hom and Dustin Smith [60m]

<https://www.youtube.com/watch?v=kEp8YeMdUX8>

Some more helpful resources going forward

Tableau bloggers worth following:

Andy Cotgreave: <http://gravyanecdote.com/>

Andy Kriebel: <http://www.vizwiz.com/>

Jeffrey Shafer: <https://www.dataplusscience.com/>

Steve Wexler (survey data): <http://www.datarevelations.com/>

Data Visualization bloggers worth following:

Alberto Cairo: <http://www.thefunctionalart.com/>

Ann Emery: <http://annkemery.com/blog/>

Stephanie Evergreen: <http://stephanieevergreen.com/category/blog/>

Andy Kirk: <http://www.visualisingdata.com/blog/>

Robert Kosara: <https://eagereyes.org/>

Nathan Yau: <http://flowingdata.com/>

Podcasts worth listening to:

Data Stories: <http://datastori.es/>

PolicyViz: <https://policyviz.com/podcast/the-policyviz-podcast/>

Tableau Wannabe: <https://soundcloud.com/tableau-wannabe-podcast>

A Twitter list of people who provide Tableau tips:

<https://twitter.com/chadskelton/lists/dataviz-tips>

Disclaimer:

This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.