

MSAN 622 – Data Visualization
Instructor: Yannet Interian
Course Syllabus
Spring 2017

SUMMARY INFORMATION

Office: 101 Howard, # 605

Office Hours: Wednesdays 2-3pm

Email Address: yinterian@usfca.edu

Class Location: 101 Howard Street, Room

COURSE GOALS

This course will address basic data visualization techniques and design principles. Students will use R with the ggplot2 and shiny packages to prototype visualizations. Students will obtain practical experience with the visualization of complex data, including multivariate data, geospatial data, textual data, time series, and network data.

On completion of this course the student should be able to:

- Understand basic data visualization terminology
- Understand and create basic charts and plots
- Design and implement interactive, multivariate, text, and temporal data visualizations
- Evaluate data visualizations
- Rapidly prototype visualizations using ggplot2 and shiny

COURSE CONTENT (subject to change)

- Week 1: Value of Visualization. Advanced ggplot2. Visualization Design.
- Week 2: Visual Perception and Principles of Design. Intro to Shiny.
- Week 3: Tableau. Multivariate Data Visualization.
- Week 4: Interaction. Text Data Visualization.
- Week 5: Design and Evaluation. Temporal Data
- Week 6: Geospatial Data. Hierarchical Data.
- Week 7: Redesign Contest, Prototype Demonstrations
- Week 8: Final Project Presentations

TEXTBOOKS

The only book required for this class is the Shiny book. Web Application Development with R Using Shiny. Chris Beeley.

I will post readings from the following books in Canvas:

1. A. Cairo. The Functional Art. 2013
2. Colin Ware. Visual Thinking for Design. 2008.
3. Stephen Few. Now you see it: : Simple Visualization Techniques for Quantitative Analysis. 2009.

HOMEWORK. You will be required to complete 4 homework assignments. You must work on homework **individually** and **turn in your own individualized write-up and code**. All homework assignments are to be completed and submitted individually. You may consult with other students in the class regarding homework, but each student should complete all parts of the assignment successfully without assistance.

GRADING. Lectures will consist of slide presentations, code demonstrations, discussions, and in-class exercises. Students will be required to complete a mix of participation exercises, homework assignments, and projects. The breakdown will be as follows:

Component	Weight
Homework	30%
Participation	20%
Final Project	50%

See the following sections for additional details on each category.

Participation : There will be weekly participation assignments. These may include contributing to in-class discussions or exercises, or commenting on prototypes from other students. These exercises are graded on a pass/fail basis.

Homework: There will be several programming homework assignments, assigned on a weekly basis. This may include evaluating and reworking existing visualizations, using existing tools to design visualizations, and prototyping custom visualizations. Homework will be submitted via a combination of GitHub and Canvas.

Projects: Students will be assigned a final visualization project. For the final project, students will select a data set and multiple visualization techniques, develop prototypes, and rework the prototypes based on peer evaluations. Students will demonstrate their final projects during a presentation or poster session.

ON CHEATING. As a Jesuit institution committed to *cura personalis*—the care and education of the whole person—the University of San Francisco has an obligation to embody and foster the values of honesty and integrity. The university upholds standards of honesty and integrity from all members of the academic community, including faculty, students, and staff. All students are expected to know and to adhere to the university’s honor code. You can find the full text of the code online at <http://www.usfca.edu/catalog/policies/honor/>. You are also bound by the terms of the MSAN Code of Conduct that you signed prior to matriculating in the analytics program. Refer to ON HOMEWORK and ON CASE STUDIES sections for details regarding student collaboration on each category of deliverable. Plagiarism consists of copying *any* material from *any* source and submitting it as your own original work, regardless of where that material was sourced: the Internet, a book, textbook, or from deliverables previously submitted by other students. All students involved in any cheating or plagiarized deliverables, i.e., the cheater as well as the person(s) who willfully enabled or facilitated the act of cheating, will be reported to the MSAN Program Director. If you ever have questions about what constitutes plagiarism, cheating, or academic dishonesty in this course, I am happy to discuss with you at your convenience.

ON DISABILITIES. If you are a student with a disability or disabling condition, or if you think you may have a disability, please contact USF Student Disability Services (SDS) at 415.422.2613 within the first week of class, or immediately upon onset of the disability, to speak with a disability specialist. If you are determined eligible for reasonable accommodations, please meet with your disability specialist so they can arrange to have your accommodation letter sent to me, and we will discuss your needs for this course. For more information, please visit <http://www.usfca.edu/sds/> or call 415.422.2613.

ON BEHAVIORAL EXPECTATIONS. All students are expected to behave in accordance with the Student Conduct Code and University policies (see <http://www.usfca.edu/fogcutter/>). Open discussion and disagreement is encouraged when done respectfully and in the spirit of academic discourse. There are also a variety of behaviors that, while not against a specific University policy, may create disruption in this course. Students whose behavior is disruptive or who fail to comply with the instructor may be dismissed from the class for the remainder of the class period and may need to meet with the instructor or Dean prior to returning to the next class period. If necessary, referrals may also be made to the Student Conduct process for violations of the Student Conduct Code.

ON THE LEARNING & WRITING CENTER. The Learning & Writing Center provides assistance to all USF students in pursuit of academic success. Peer tutors provide regular review and practice of course materials in the subjects of Math, Science, Business, Economics, Nursing and Languages. Other content areas can be made available by student request. To schedule an appointment, log on to TutorTrac at <https://tutortrac.usfca.edu>. Students may also take advantage of writing support provided by Rhetoric and Language Department instructors and academic study skills support provided by Learning Center professional staff. For more information about these services contact the Learning & Writing Center at 415.422.6713, lwc@usfca.edu or stop by Cowell 215. Information may also be found at www.usfca.edu/lwc.

ON COUNSELING AND PSYCHOLOGICAL SERVICES. Our diverse staff offers individual, couple, and group counseling to student members of our community. Services are confidential and free of charge. Call 415.422.6352 for an initial consultation appointment. Having a crisis at 3 AM? We are still here for you. Telephone consultation after hours is available between the hours of 5:00 PM to 8:30 AM; call the above number and press 2.

ON CONFIDENTIALITY, MANDATORY REPORTING AND SEXUAL ASSAULT. As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I also have a mandatory reporting responsibility related to my role as a faculty member. I am required to share information regarding sexual misconduct or information about a crime that may have occurred on USF's campus with the University. Here are other resources:

- To report any sexual misconduct, students may visit Anna Bartkowski (UC 5th floor) or see many other options by visiting our website: www.usfca.edu/student_life/safer
- Students may speak to someone confidentially, or report a sexual assault confidentially by contacting Counseling and Psychological Services at 415.422.6352.
- To find out more about reporting a sexual assault at USF, visit USF's Callisto website at: www.usfca.callistocampus.org.
- For an off-campus resource, contact San Francisco Women Against Rape 415.647.7273 (www.sfwar.org).