



**School of Communication and Information
Information Visualization**

04:547:321:01

Spring 2023

Syllabus

Course Delivery: Hybrid with classroom meetings on Wed. 10:20-11:40 am, SCI 119

Course Website: (<http://canvas.rutgers.edu>)

Instructor: Jennifer Silvia Muller

Email: Jennifer.silvia.muller@rutgers.edu

24-48 hour turnaround on email correspondence

Office Hours: Zoom office hours, for now email me for appts.

Instructional Asst.: Matt Chiarello

Email: mc2556@comminfo.rutgers.edu

24-48 hour turnaround on email correspondence

Office Hours: TBA

Instructor Bios

Silvia Muller (she/her/hers) is currently a curriculum developer, education researcher, and instructor for Rutgers University. She began her career as an IT specialist at Rutgers in 1994 and has been designing course materials and teaching for many different programs at the University. She has received a B.A. in the Humanities at Sarah Lawrence College and an M.L.S. and Ed.D. at Rutgers University. She is currently working on a book about the trans-Atlantic origins of the New York City school system in the early 19th century.

Matt Chiarello

Catalog Description

In this course, students learn how to effectively present complex information using the Web, multimedia or information visualization techniques. The course develops an understanding of how best to leverage human perceptual capabilities to communicate information or gain insights into large and abstract data.

Pre- and Co-requisites

((01:198:142 or 01:960:142 DATA 101) and (01:960:291 STATISTICAL INFERENCE FOR DATA SCIENCE)) **OR**

((04:547:201 INTRODUCTION TO COMPUTER CONCEPTS) and (04:547:201 INTRODUCTION TO COMPUTER CONCEPTS))

Course Learning Objectives

Upon successful completion of this course, students will be able to:

- Identify key dimensions of human visual perception and relate them to creating effective information visualizations.
- Demonstrate understanding of key design principles for creating effective presentations of information.
- Understand major techniques and systems in information visualization.
- Create an effective information visualization prototype for a specific topic or data set.

Course Technology Requirements

- Access to a laptop/computer capable of connecting to the Canvas platform. For more details see the expanded statement below. Smartphones and tablets will not be sufficient for some of the work that we will engage in on Canvas! For a detailed list of browsers and platforms supported see: <https://canvas.rutgers.edu/documentation/general/canvas-tip-sheet-for-students/>
- In this course we will use Tableau Desktop and Microsoft Excel. Before the first class please make sure you have reliable access to a computer and meet the system requirements to download and install Tableau Desktop. If you do not have reliable access to a computer or your computer cannot support Tableau Desktop, reach out to the instructional staff to explore options.
- We will be using the Hypothesis annotation software through the Canvas plug-in over the semester. To review the tool's requirements please visit: <https://web.hypothes.is/help/introduction-to-the-hypothesis-lms-app-for-students/>

Learning Management System (LMS) – Canvas

You will use Canvas in this course for various purposes, including (but not limited to) the following:

- Retrieving course materials, including assignment instructions.
- Submitting your completed coursework.
- Participating in discussion threads.
- Communicating with the instructor, assistants, and classmates.

If you are having technical difficulties with Canvas, contact the Canvas helpdesk:

- Email support: help@canvas.rutgers.edu
- Phone support: 877 – 361 – 1134
- For other forms of IT help:
 - Email: help@oit.rutgers.edu
 - Phone: 833-648-4357

Resources are available for you to learn how to use the Canvas LMS if you need to:

- Student Orientation Tutorial (self-paced)
 - <https://rutgers.instructure.com/courses/35>
- Getting Started in Canvas for Students
 - <https://canvas.rutgers.edu/students/getting-started-in-canvas-students/>

Major Readings

This course uses a collection of readings – most are available as .pdfs through the Canvas modules. Two books you will want to purchase are:

- Schwabish, J., *Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks*. New York: Columbia University Press. 2021
- Tufte, E., *Visual and Statistical Thinking: Displays of Evidence for Decision Making*. Cheshire, Connecticut: Graphics Press, 1997

You will find any week's readings under the "Course Readings" item. Please have the readings finished at the beginning of the week. You will usually find that one of the readings for the week is set up as a Hypothesis activity – that being said, don't forget to do any additional readings for that week!

Methods of Assessment and Grading

Assignment	Due	Weight
Hypothesis Assignments	Ongoing	(10 @ 30 pts. = 300 pts.)
Tech Exercises	Ongoing	(5 @ 50 pts. = 250 pts.)
Information Graphic Identifications	Ongoing	(2 @ 50 pts. = 100 pts.)
Midterm Project	March 10	150 pts.
Final Project	May 1	200 pts.
		1000 pts. total

Grading Scale

Letter Grade	
A	900 – 1000 points
B+	875 – 899 points
B	810 – 874 points
C+	775 – 809 points
C	700 – 774 points
D	650 – 699 points
F	649 points or less

Please note that for major assignments like the midterm and final projects I only grade written work and presentations above 90% if the work is extraordinary both in the scope of its ideas and its execution. **Do not expect work that merely fulfills the stated requirements for the assignment to earn a perfect score.**

Course Calendar:

Week	Dates	Title/Topic(s)	What To Do: Activities, and Assignments w/Deadlines
1 & 2	1/17 – 1/28	Introduction/ Syllabus Review / Visualizing Important Information	- Class Meetings – Wednesdays, 1/18 & 1/25 - Readings/Videos - Video: <i>Maya Lin a Strong Clear Vision</i>, see Canvas for time markers - Finkelpearl, T. (2000). <i>Dialogues in public art</i>. MIT Press. .pdf available on Canvas - Yau, N. (n.d.) One Dataset, Visualized 25 Ways. FlowingData. https://flowingdata.com/2017/01/24/one-dataset-visualized-25-ways/ - Schwabish, J. (2021). <i>Better Visualizations</i>. Chapter 1. - Introductions Discussion - initial posting due by Sunday, 1/22, 11:59, p.m. EST; Round 2 replies due by Tuesday, 1/24, 11:59, p.m., EST - Hypothesis - initial annotations due by Tuesday, 1/24, 11:59 p.m., EST; follow-up annotations due by Tuesday, 1/31, 11:59 p.m., EST
3	1/29 –2/5	Making Better Visualizations	- Class meeting Wednesday 2/1 - Readings/Videos - Schwabish, J. (2021) <i>Better Visualizations</i>. Chapter 2. - Berry, C. (2021, June 8). <i>When data visualization really isn't useful (and when it is)</i>. Old Street Solutions. https://www.oldstreetsolutions.com/good-and-bad-data-visualization - Wainer, H. (2013). <i>Visual revelations: Graphical tales of fate and deception from Napoleon Bonaparte to Ross Perot</i>. Psychology Press. Ch. 1. - Hypothesis - initial annotations due by Tuesday, 1/31, 11:59 p.m., EST; follow-up annotations due by Tuesday, 2/7, 11:59 p.m., EST - Tech Exercise #1 due in Canvas 2/5
4	2/6 – 2/12	Escaping Flatland	- Class meeting Wednesday 2/8 - Readings/Videos - Tufte, E. R., Goeler, N. H., & Benson, R. (1990). <i>Envisioning information</i>. Cheshire, CT: Graphics Press. Ch. 1. - Hypothesis - initial annotations due by Tuesday, 2/7, 11:59 p.m., EST; follow-up annotations due by Tuesday, 2/14, 11:59 p.m., EST - Information Graphic Identification #1 due 2/12
5	2/13 – 2/19	Reasoning from Visual Evidence	- Class meeting Wednesday 2/15 - Readings/Videos - Tufte, E. R. (2006). <i>Beautiful Evidence</i>. Cheshire, CT: Graphics Press. Ch. 5. - Kraak, M. J. (2014). <i>Mapping time: illustrated by Minard's map of Napoleon's Russian campaign of 1812</i>. Esri. Ch. 2. - Hypothesis - initial annotations due by Tuesday, 2/14, 11:59 p.m., EST; follow-up annotations due by Tuesday, 2/21, 11:59 p.m., EST - Tech Exercise #2 due in Canvas 2/19

6	2/20 – 2/26	Micro/Macro Readings / Layers	• Class meeting Wednesday 2/22 • Readings/Videos ◦ Tufte, E. R., & Robins, D. (1997). <i>Visual explanations</i>. Cheshire, CT: Graphics. Ch. 2. • Hypothesis - initial annotations due by Tuesday, 2/21, 11:59 p.m., EST; follow-up annotations due by Tuesday, 2/28, 11:59 p.m., EST
7	2/27 – 3/5	Redesigning Visualizations	• Class meeting Wednesday 3/1 • Readings/Videos ◦ Schwabish, Ch. 13 ◦ Tufte, E. (1990) <i>Envisioning Information</i>. Cheshire, Connecticut: Graphics Press. Ch. 4 & 5 ◦ Harford, T. (2021). <i>The Data Detective: Ten Easy Rules to Make Sense of Statistics</i>. Penguin. Ch. 7 • Hypothesis - initial annotations due by Tuesday, 2/28, 11:59 p.m., EST; follow-up annotations due by Tuesday, 3/7, 11:59 p.m., EST
8	3/6 – 3/10	Maps	• Class meeting Wednesday 3/8 • Readings/Videos ◦ Meirelles, I. (2013). <i>Design for information: an introduction to the histories, theories, and best practices behind effective information visualizations</i>. Rockport publishers. Ch. 4. ◦ Monmonier, M. (2008). <i>Cartographies of danger</i>. University of Chicago Press. Ch. 1. • Hypothesis - initial annotations due by Tuesday, 3/7, 11:59 p.m., EST; no follow-up annotations for this activity! • Midterm projects due in Canvas on 3/10
• NO CLASS MEETING ON 3/15 – HAVE A GOOD BREAK!			
9	3/20 – 3/26	Midterm Projects	• Class meeting Wednesday 3/22 • Tech Exercise #3 due in Canvas 3/26
10	3/27 – 4/2	Interactive Information Visualization	• Class meeting Wednesday 3/29 • Readings/Videos ◦ Ivanković, D., Barbazza, E., Bos, V., Fernandes, Ó. B., Gilmore, K. J., Jansen, T., ... & Kringos, D. (2021). Features Constituting Actionable COVID-19 Dashboards: Descriptive Assessment and Expert Appraisal of 158 Public Web-Based COVID-19 Dashboards. <i>Journal of medical Internet research</i>, 23(2), e25682. • Hypothesis - initial annotations due by Tuesday, 3/28, 11:59 p.m., EST; follow-up annotations due by Tuesday, 4/4, 11:59 p.m., EST • Information Graphic Identification #2 due 4/2

11	4/3 – 4/9	Scientific Visualization	• Class meeting Wednesday 4/5 • Readings/Videos ◦ Fry, B., <i>genomic cartography</i>, retrieved from http://acg.media.mit.edu/people/fry/cartography/draft-021219d.pdf on June 1, 2004. • Hypothesis - initial annotations due by Tuesday, 4/4, 11:59 p.m., EST; follow-up annotations due by Tuesday, 4/11, 11:59 p.m., EST • Tech Exercise #4 due in Canvas on 4/9
12	4/10 – 4/16	Work on Final Projects	• Class meeting Wednesday, 4/12 • Tech Exercise #5 due in Canvas on 4/16
13	4/17 – 4/23	Multi Dimensional Information Design	• Class meeting Wednesday 4/19 • Readings/Videos ◦ Schwabish, Ch. 3. ◦ Eames Office. (1977). <i>Powers of Ten</i>. [Video]. YouTube. https://youtu.be/0fKBhvDjuy0 ◦ American Museum of Natural History. (2021). <i>Tour the Scales of the Universe!</i> [Video]. YouTube. https://youtu.be/y60j3nC-Od4 ◦ Hammer, J. (2009). New York Mathematical Tourists. <i>The Mathematical Intelligencer</i>, 31(4), 40-43. ◦ Morrison, P. and Morrison, P. R. H. (1983). <i>Differences of Scale: Powers of Ten. A Book about the Relative Size of Things in the Universe and the Effect of Adding Another Zero</i>. Scientific American Library (Freeman), New York. • Hypothesis - initial annotations due by Tuesday, 4/18, 11:59 p.m., EST; follow-up annotations due by Tuesday, 4/25, 11:59 p.m., EST • Information Graphic Identification #3 due on Canvas by Sunday, 4/23, at 11:59 p.m., EST
14 & 15	4/24 – 5/1	TBD	• Class meetings Wednesday 4/26 • Readings/Videos ◦ TBD • Final Projects due on Canvas by Monday, 5/1, at 11:59 pm, EST

Late Submission Policy:

Unless otherwise noted, all written assignments, group projects, etc., are due at the time and date listed in the syllabus. If you experience an unavoidable personal situation that prevents you from completing work on time, please inform the instructor **prior to the date the work is due**. Late work will result in points taken off, a lowering of the assignment grade, and/or an “F,” depending on the assignment. Even excused late work will probably result in more limited grading feedback.

“It is University policy (University Regulation on Attendance, Book 2, 2.47B, formerly 60.14f) to excuse without penalty students who are absent from class because of religious observance, and to allow the make-up of work missed because of such absence. Examinations and special required out-of-class activities shall ordinarily not be scheduled on those days when religiously observant students refrain from participating in secular activities. Absences for reasons of religious obligation shall not be counted for purposes of

reporting. Students are advised to provide timely notification to instructors about necessary absences for religious observances and are responsible for making up the work or exams according to an agreed-upon schedule.”

Academic Integrity

The consequences of scholastic dishonesty are very serious. Please review Rutgers’ academic integrity policy:

<http://nbacademicintegrity.rutgers.edu/home/academic-integrity-policy/>

Additional student academic integrity resources are available:

<http://nbacademicintegrity.rutgers.edu/home/for-students/>

Academic integrity means, among other things:

- Develop and write all of your own assignments.
- Show in detail where the materials you use in your papers come from. Create citations whether you are paraphrasing authors or quoting them directly. Be sure to always show source and page number within the assignment and include a bibliography in the back.
- Do not look over at the exams of others or use electronic equipment such as cell phones or MP3 players during exams.
- Do not fabricate information or citations in your work.
- Do not facilitate academic dishonesty for another student by allowing your own work to be submitted by others.

If you are doubtful about any issue related to plagiarism or scholastic dishonesty, please discuss it with the instructor.

Student Conduct

Rutgers University students are expected to conduct themselves in a manner that promotes learning, leadership, and civility. The University Code of Student Conduct was created for the purpose of ensuring the safety and security of the Rutgers community. The code of student conduct outlines inappropriate behavior of University students on and throughout Rutgers University campus and provides guidelines for the formal complaint and disciplinary process.

Students who are found in violation of the student code of conduct may have their case adjudicated through the code of student conduct complaint process. Violations may include academic dishonesty, causing physical or environmental harm, sexual harassment, intimidation and bullying, causing a disruption, disorderly conduct, undisclosed recording, and theft or damage of property. For a full list of violations, refer to the University Code of Student Conduct policy.

A faculty member or Rutgers University community member can file a student conduct complaint against a student using the University Code of Student Conduct Complaint form. For detailed guidelines of the complaint and adjudication process, refer to the University Code of Student Conduct regulations.

- Office of Student Conduct
 - <http://studentconduct.rutgers.edu/about-us/contact-us>
- Student Code of Conduct Policy
 - <http://studentconduct.rutgers.edu/student-conduct-processes/university-code-of-student-conduct>

- Student Conduct Complaint Process
 - <http://studentconduct.rutgers.edu/student-conduct-processes/the-conduct-disciplinary-process>
- Students' Rights in the Student Conduct Complaint Process
 - <http://studentconduct.rutgers.edu/resources/rights-of-complaint-parties-and-accused-students/>
- Share a Concern
 - <http://health.rutgers.edu/do-something-to-help>
- Sexual Misconduct and Title IX Regulations
 - <http://studentconduct.rutgers.edu/student-conduct-processes/sexual-misconduct-and-title-ix/>

Civility Statement

Any successful learning experience requires mutual respect on behalf of the students and the instructor. Being part of a class means that you are engaged in work to create new knowledge and this process isn't aided by being subjected to disruptive, rude, or challenging behavior either directed at students or staff. We will be communicating through a number of different channels throughout the course - try to be thoughtful about your communication and be respectful for your work and others' work in the class throughout.

Library Resources

Rutgers University Libraries offer numerous resources to assist students. Librarians can help guide you through research and reference tools. A series of [LibGuides](#) are available to get you started.

Here are some of the LibGuides you may find useful:

- [Introduction to Rutgers University Libraries \(http://libguides.rutgers.edu/intro\)](http://libguides.rutgers.edu/intro)
- [Congressional Research \(http://libguides.rutgers.edu/congress\)](http://libguides.rutgers.edu/congress)
- [Communication Studies \(http://libguides.rutgers.edu/cat.php?cid=25866\)](http://libguides.rutgers.edu/cat.php?cid=25866)
- [Government Information \(http://libguides.rutgers.edu/cat.php?cid=25881\)](http://libguides.rutgers.edu/cat.php?cid=25881)
- [Journalism and Media Studies \(http://libguides.rutgers.edu/cat.php?cid=34201\)](http://libguides.rutgers.edu/cat.php?cid=34201)
- [Law \(http://libguides.rutgers.edu/cat.php?cid=25854\)](http://libguides.rutgers.edu/cat.php?cid=25854)
- [Library and Information Science \(http://libguides.rutgers.edu/cat.php?cid=25870\)](http://libguides.rutgers.edu/cat.php?cid=25870)
- [Political Science \(http://libguides.rutgers.edu/cat.php?cid=25871\)](http://libguides.rutgers.edu/cat.php?cid=25871)

STUDENTS WITH DISABILITIES

Students with documented disabilities who need accommodations in this class must do so through the [Rutgers Disabilities Services Office \(http://disabilityservices.rutgers.edu/\)](http://disabilityservices.rutgers.edu/). You can also speak with a SC&I adviser about your disability by [contacting the Office of Student Services](#) by phone 848-932-7550 or email sciss@comminfo.rutgers.edu.

RUTGERS LEARNING CENTERS

The **Rutgers Learning Centers** (<http://lrc.rutgers.edu/>) provide tutoring, study groups, and review sessions for your courses. They also host workshops and provide individual academic coaching to help you further develop your study strategies and self-management skills.

Rutgers also has a **Writing Coaching Program** (<https://rlc.rutgers.edu/student-services/writing-coaching>) where students can get help with writing skills and assignments.

STUDENT WELLNESS SERVICES

Rutgers University Student Assembly (RUSA) Resource List

Counseling, ADAP & Psychiatric Services (CAPS) (<http://health.rutgers.edu/medical-counseling-services/counseling>)

(848) 932-7884

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA) (<http://vpva.rutgers.edu>)

(848) 932-1181 / Help is available 24/7.

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty.

Disability Services (ODS) (<https://ods.rutgers.edu>)

(848) 445-6800 / dsoffice@echo.rutgers.edu

The Office of Disability Services works with students with a documented disability to determine the eligibility of reasonable accommodations, facilitates and coordinates those accommodations when applicable, and lastly engages with the Rutgers community at large to provide and connect students to appropriate resources.

Scarlet Listeners (<https://rutgers.campuslabs.com/engage/organization/scarletlisteners>)

(732) 247-5555

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.

SC&I Student Support Services

Students seeking help with the content of this course should contact the instructor either during office hours or make a separate appointment.

Students seeking help with the scheduling of classes or registration should contact the **SC&I Student Services Office** (<http://comminfo.rutgers.edu/student-services/contact-us.html>).