Northeastern University
Khoury College of Computer Sciences

DS4200: Information Presentation & Data Visualization
Course Policies and Syllabus, 2024 Spring

Instructor	Xiaoyi Yang	**Email:** xiaoy.yang@northeastern.edu **Office:** Meserve 341
Lecture	Monday & Thursday International village 019 Monday & Wednesday Richards Hall 236	11:45 am - 1:25 pm 2:50 pm - 4:30 pm
Office Hours	Tuesday Wednesday Thursday	10 AM - 12 PM 4:30 - 6 PM 1:30 - 3 PM
Text	*Visualization Analysis and Design* by Tamara Munzner Free PDF online via Northeastern	
Web Site	Canvas, Piazza	

COURSE DESCRIPTION AND OBJECTIVES

Introduces foundational principles, methods, and techniques of visualization to enable creation of effective information representations suitable for exploration and discovery. Covers the design and evaluation process of visualization creation, visual representations of data, relevant principles of human vision and perception, and basic interactivity principles. Studies data types and a wide range of visual data encodings and representations. Draws examples from physics, biology, health science, social science, geography, business, and economics. Emphasizes good programming practices for both static and interactive visualizations. Creates visualizations in Python and open web-based authoring libraries. Requires programming in Python, JavaScript, HTML, and CSS. No previous experience in web designing is acceptable. Requires extensive writing including documentation, explanations, and discussions of the findings from the data analyses and visualizations.
After completion of the course students should be able to:

- Choose appropriate visualization methods for a given data type
- Assess the quality and effectiveness of a visualization
- Design an effective visualization using design and human perception principles

- Implement a static or interactive visualization
- Implement web-based visualizations in JavaScript/HTML/CSS or Python
- Present and be knowledgeable about contemporary visualization topics
- Effectively communicate technical material in written form
- Effectively communicate technical material in oral presentation form
- Constructively critique and assess a visualization in written form

CLASS PREPARATION

General. Students should come to each class meeting prepared to write and talk intelligently about the material. The assignments will require thought and analysis, which cannot be had in 15 minutes or less. Give yourself adequate time to read carefully, to think and reflect, to sleep on it, then maybe glance it over before class.

Computing and Software. Computing is an essential part of modern data science practice: meaningful data science is impossible without computing. We will make use of multiple computing tools, including web design tools for code demonstration and some homework. There is also a long group project in this course. You should plan to bring a charged laptop to class every day.

Textbook. The textbook provides background material that is meant to supplement lectures. Lecture notes indicate what sections of the text you should read if you choose to do so.

Attendance. All students are expected to come to class prepared to learn and actively participate. However, if you must be absent check Canvas for assignments, announcements, and any other information you may have missed. There are some group work day and the attendance is required. Those days will be notified on the schedule and Canvas announcement.

COURSE ASSESSMENT

Your grade in DS4200 will contain the following components.

1. Homework (40%): There will be regular homework assignments over the course of the semester. Each assignment will require the student to apply the concepts discussed in the readings and in-class lectures to both programming assignments for the actual building and implementation of static and interactive visualizations as well as short writing assignments (e.g., design critiques). The homework assignments are an individual assessment and should not be completed in groups. The homework will be due on Fridays.
2. Group Project (40%): Students need to work as a group to complete a project. In the project, students need to collect and analysis the data, then produce two group presentations as well as a writing report. There are a couple of check points for the projects. The details will be released later.
3. Weekly quiz (20%): There is a quiz every week to check students' basic understanding of the concepts in the lecture. The quizzes are multiple choices questions and may need to attach the draft in lecture activities. The lowest score will be dropped.

All assignments will be submitted to Gradescope. All assignments must be readable, and when appropriate, all work must be shown to receive credit. Late homework within 48 hours will receive 20% penalty, unless other arrangements have been made before the due date. The lowest quiz score will be dropped. Adjustments may be made in extraordinary circumstances.

COURSE GRADE

Your overall course score will be a weighted average of each element as noted above. Grades may be curved at the instructors' discretion. A letter grade will be assigned based on:

A: 90 - 100 **A-:** 88 - 90 **B+:** 85 - 88 **B:** 80 - 85 **B-:** 78 - 80 **C+:** 75 - 78 **C:** 70 - 75
D: 60 - 70 **F:** Below 60

OTHER POLICIES

Emails. Sending email to your instructor should be treated as professional communication. Students should not assume their emails will be answered immediately, and should allow 24 hours for a response. **To increase the chances of a quick response, start the subject line with "DS4200 STUDENT NAME" so that it is clear that the email pertains to this class.**

Piazza. Piazza will be used for discussion of class assignments. While you may make yourself anonymous to your classmates, your identity will be known to us.

Office hours. The purpose of office hours is to provide you with an opportunity for additional conversation, guidance or help. Please feel free to come to our office hours at the time designated above. If you are not able to attend the office hour, *please email me to set up an appointment.*

Grades and regrades. Course grades will appear on the Canvas. Each student is responsible for verifying his or her recorded scores on an ongoing basis. If there is any homework question that you want to request for a regrade, please come to the office hour or email me. **Any regrade request should be submitted within 1 week of the homework being graded.**

ACADEMIC INTEGRITY

This course is governed by the Policy on Academic Integrity Policy. The policy can be found at the link below. https://osccr.sites.northeastern.edu/academic-integrity-policy/

You are encouraged to work together on homework labs and in-class activities, but all work you submit must be your own (unless the assignment specifically states otherwise). Online AI tools like ChatGPT can be used to collect and organize information but cannot be used to finish the assignment. A first act of academic dishonesty will result in a score of zero on the item in question. A subsequent offense will result in an F for the course. Students should consult the University academic integrity policy if they have any questions.

TAKE CARE OF YOURSELF

Disease. If you are sick, please do not come to class. You can have two wellness days if you need. Please follow the instructions of Student Health, Education, and Compliance, take good care of yourself, and document your absence with me. While masks are not required, out of care and concern for our community, we encourage masking in the classroom. Please follow all university related requirements. If you need a temporary accommodation due to diseases or related travel restrictions, please also notify me.

Healthy Lifestyle. Do your best to maintain a healthy lifestyle by eating well, exercising, avoiding excessive drug and alcohol use, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. Your mental health is more important than your grade in this course. All of us benefit from support during times of struggle. You are not alone. An important part of the college experience is learning how to ask for help.

University Health and Counseling Services. If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, I strongly encourage you to seek support. University Health and Counseling Services offers students assistance in navigating their way at Northeastern through support, resources and advising. Call 617-373-2772 and visit their website at https://www.northeastern.edu/uhcs/counseling-services/. Consider reaching out to us, a friend, faculty or family member you trust for help getting connected to the support that can help. If the situation is life threatening, call the police:
On campus: Northeastern University Police Department: (617)373-2121; Off campus: 911

IMPORTANT UNIVERSITY DATES

- Monday, Jan 8th – Spring semester begins
- Monday, Jan 15th – Martin Luther King, Jr. Day, no classes
- Monday, Jan 22nd - last day to elect pass/fail for fall classes (may be extended by instructor to March 1st)
- Monday, Jan 29th – last day to DROP classes without a "W"
- Thursday, Feb 1st - last day to file a Final Exam Conflict Form for fall classes
- Monday, Feb 19th - Presidents Day, no classes
- Monday, Mar 4th - First day of fall break
- Monday, Apr 15th – Patriots Day, no classes
- Wednesday, Apr 17th - Last day of spring classes

DS4200: Information Presentation & Data Visualization
Tentative Course Schedule (*subject to change*)

Week	Date	Topic	Homework/Exam
1	Jan 8th, 10th/11th	Introduction and course overview Design rules of thumb	Homework 1
2	Jan 17th/18th	Review: basic plotting in Python	
3	Jan 22nd, 24th/25th	Marks and channels Data type	Homework 2
4	Jan 29th, 31st/Feb 1st	Abstraction Visual Encodings	Project release
5	Feb 5th, 7th/8th	Color, Pop-Out Effects, and Illusions Interaction	Homework 3
6	Feb 12th, 14th/15th	View, Facet and Linked Data group project work day	Project proposal due
7	Feb 21st/22nd	Midterm group presentation	
8	Feb 26th, 28th/29th	Focus and Context Filtering & Aggregation	Project check point 1
9	Mar 11th, 13th/14th	Trees and Networks	
10	Mar 18th, 20th/21st	Geospatial Data	Homework 4
11	Mar 25th, 27th/28th	Storytelling	Project check point 2
12	Apr 1st, 3rd/4th	Spatial, 3D, and Scientific Visualization Validation & Evaluation	Homework 5
13	Apr 8th, 10th/11th	Group final presentation	
14	Apr 15th, 17th/18th	No classes	Final group report due