CS 725/825, Spring 2024 Syllabus

MW 3-4:15pm, ECSB 2120 and online via Zoom

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Course Overview

Catalog Description: This course covers the theory and application of information visualization and of visual analytics, the science of combining interactive visual interfaces and information visualization techniques with automatic algorithms to support analytical reasoning through human-computer interaction. Research on visual perception, cognition, interactive visual interfaces, and visual analytics will be covered. Practical techniques for the display of complex multivariate data will be addressed. Course projects will require the development of interactive web-based interfaces to analyze and visualize real-world datasets.

Main Activities: During the semester, students will develop interactive visualizations using D3.js, read academic papers from IEEE VIS and other top visualization conferences, give class presentations on current topics in information visualization and visual analytics, and gain hands-on experience in visualizing real-world datasets. Time will be reserved in the semester to cover special topics selected by the class.

Prerequisite: CS 625 (Data Visualization)
If you have not taken CS 625, see What Do I Need to Know Coming into This Course?

Instructor Contact and Office Hours

Dr. Michele Weigle: mweigle at cs.odu.edu, https://www.cs.odu.edu/~mweigle/

My office hours are tentatively Mon/Wed 1:30-2:30pm (in-person ECSB 3327 or Zoom) or by appointment. See Canvas for the link to the Zoom office hours meeting room. For Zoom office hours, students will be placed into the waiting room if I am already meeting with another student.

If you cannot attend during regular office hours, please contact me to set up an alternate appointment time.

Meeting Times and Course Delivery Method

This course will be delivered in a hybrid method, with one face-to-face section in a traditional classroom and several online sections available:

CS 725 (MS) sections:

- CRN 30958 - in-person
- CRN 29143 - WC2 (in Hampton Roads)
- CRN 29133 - WC5 (in Virginia, but outside of Hampton Roads)
- CRN 29146 - WC7 (in the US, but outside of Virginia)

CS 825 (PhD) sections:

- CRN 30959 - in-person
- CRN 29149 - WC2 (in Hampton Roads)

- CRN 29139 - WC5 (in Virginia, but outside of Hampton Roads)
- CRN 29153 - WC7 (in the US, but outside of Virginia)

The link to the Zoom class session will be made available through the Course Collaboration Tool in Canvas. All course materials will be made available through this GitHub repository. The audio of in-person class meetings and all materials projected in class will be live streamed via Zoom and recorded. Online students must meet the same deadlines as face-to-face students. All deadlines are based on the local timezone in Norfolk, VA.

This is a synchronous class. All students, unless otherwise arranged, are expected to actively participate during the regular class meeting time.

Textbook and Materials

There is no required textbook, but Tamara Munzner's *Visualization Analysis and Design* (textbook from CS 625) is highly recommended if you don't already have it.

- online version accesssible for free via ODU
- includes author's slides from half-day and full-day tutorials, PDF versions of all figures
- textbook errata
- author's keynote at d3.unconf (55 min), overview of material from book

Other materials will include papers published via IEEE Xplore digital library (link here is via ODU libraries).

You will be required to write clearly about your visualization designs and design process. For writing help, I always suggest two inexpensive books:

- *Writing for Computer Science* by Justin Zobel
- *The Elements of Style* by Strunk and White

In addition, see the online writing resources collected on my New Student Resources page.

Grading

This will be a project and presentation based course. No exams will be given. The general breakdown will be:

- 50% - homework assignments
- 25% - paper presentation
- 25% - final project

Grading Scale

The grading scale is as follows:

percentage	letter
100-94	A
93-90	A-
89-88	B+

percentage	letter
87-84	B
83-80	B-
79-78	C+
77-74	C
73-70	C-
69-0	F

There is no separate grading scale for PhD students, but PhD students will typically be held to a higher standard.

Late Assignments

Any assignment submitted after its deadline is considered late. Late assignments lose 1 point for every 24 hours they are late. Submissions over 72 hours late are not accepted. This time limit includes weekends -- they are counted just like weekdays. I reserve the right to specify that late submissions will not be accepted for particular assignments.

- 0-24 hours late: -1 point
- 25-48 hours late: -2 points
- 49-72 hours late: -3 points
- over 72 hours late: not accepted

Summary Schedule

Note: This is a tentative schedule and may change during the semester. The complete schedule with assignments and due dates will be update in on our class repo README.

ODU Spring 2024 academic schedule

Week	Class Date	Topic
1	Jan 8, 10	Course Intro, Data Vis Overview
2	Jan 15, 17	Tue: **NO CLASS - MLK Day** Thu: TBA
3	Jan 22, 24	Visual Analytics Principles, Vega-Lite Intro
4	Jan 29, 31	IEEE VIS Conferences, Reading Academic Papers, D3 Principles and Data Manipulation
5	Feb 5, 7	Giving Presentations, D3 Vis Intro
6	Feb 12, 14	Handling Complexity in Data, D3 Vis
7	Feb 19, 21	Network and Tree Visualization, Interactivity in D3

Week	Class Date	Topic
8	Feb 26, 28	Dashboard Design, Implementing Dashboards in Vega-Lite and D3
	Mar 4, 6	**NO CLASS - Spring Break**
9	Mar 11, 13	Project Discussion
10	Mar 18, 20	Visualizing Uncertainty
11	Mar 25, 27	VIS Paper Presentations
12	Apr 1, 3	VIS Paper Presentations
13	Apr 8, 10	TBA
14	Apr 15, 17	Project Demos
15	Apr 22	TBA

Course Policies

Email/Canvas

Each student must check the class Canvas site and email daily. You should use our class Canvas Discussion Board to ask and answer general course-related questions. I will use Canvas Announcements to notify you about important updates (assignment deadline changes, office hours cancellations, etc.).

Attendance

In-person students: I expect you to arrive on time for class. Your grade will be affected if you are consistently tardy. Students may leave after 15 minutes if the instructor or a guest lecturer does not arrive in that time. You are expected to attend class in-person unless you are sick. If you cannot attend a class meeting in-person, you must email the instructor at least 2 hours before class time.

Online students: It is essential that you regularly stay involved in class activities. This includes attending synchronous class meetings, checking the class Canvas for announcements, and submitting assignments on time. *This is a synchronous class. All students, unless otherwise arranged, are expected to actively participate during the regular class meeting time. In addition, online students should treat this like attending a regular class and keep their camera on (blur your background or use a background image).*

If you have to miss a class, you are responsible checking the course Canvas site for announcements and the class video or the class GitHub repo to find any assignments or notes you may have missed.

If there are days on which the scheduled class meeting time is cancelled due to weather, there may still be assignments made and due. A post will be made to Canvas Announcements whenever the class meeting is cancelled.

Classroom Conduct

Please be respectful of your classmates and instructor by minimizing distractions during class. Cell phones and laptops must be turned to silent during class. Laptops must be closed when other students are presenting.

Make-up Work

Make-ups for graded activities are possible only with a valid written medical or university excuse. It is the student's responsibility to give the instructor the written excuse and to arrange for any makeup work to be done.

Disability Services

In compliance with PL94-142 and more recent federal legislation affirming the rights of disabled individuals, provisions will be made for students with special needs on an individual basis. The student must have been identified as special needs by the university and an appropriate letter must be provided to the course instructor. Provision will be made based upon written guidelines from the University's Office of Educational Accessibility. All students are expected to fulfill all course requirements.

Students are encouraged to self-disclose disabilities that have been verified by the Office of Educational Accessibility by providing Accommodation Letters to their instructors early in the semester in order to start receiving accommodations. Accommodations will not be made until the Accommodation Letters are provided to instructors each semester.

Seeking Help

The course Canvas site should be your first reference for questions about the class. If you have questions about course requirements or materials, post questions using the class Canvas Discussion Board. For extra help, attend office hours.

Use of ChatGPT and other AI Tools

The use of ChatGPT or other AI tools is permitted to some extent in this class. These tools are being rapidly adopted, so it is important that you have some experience with their use. These tools are best used to help you work smarter, not do your work for you. Remember that an essential part of being in graduate school is to develop skills that you will need to be successful in the workplace. Using aids just to complete an assignment in the quest for high marks will not help you after you leave school.

I encourage you to use these tools to help you deepen your understanding and to review material you find challenging. If you use them to blindly do your homework for you, your learning will suffer and it will be obvious. But, if you use them to help clarify misunderstandings as you go, you will work and learn faster and hopefully build a solid foundation.

For all homework assignments, you must include a list of websites or other references that you consult in solving the assignment. This includes AI tools. Not only must you include the website for the tool, but you must include a link to, or screenshot of, the conversation you had with the tool. (ChatGPT has the option to create a link to a conversation.) You must also write out in your HW report the initial prompt that you used.

See Guidelines on the Use of ChatGPT in CS 725 for further information about using these tools in class this semester.

Note that this does not mean that ChatGPT is acceptable for use in other courses. This policy applies only for CS 725/825.

Academic Integrity

Old Dominion University is committed to students' personal and academic success. In order to achieve this vision, students, faculty, and staff work together to create an environment that provides the best opportunity for academic inquiry and learning. All students must be honest and forthright in their academic studies. Your work in this course and classroom behavior must align with the expectations outlined in the Code of Student Conduct, which can be found at https://odu.edu/oscai.

The following behaviors along with classroom disruptions violate this policy, corrupt the educational process, and will not be tolerated.

- Cheating: Using unauthorized assistance, materials, study aids, or other information in any academic exercise.
- Plagiarism: Using someone else's language, ideas, or other original material without acknowledging its source in any academic exercise.
- Fabrication: Inventing, altering or falsifying any data, citation or information in any academic exercise.
- Facilitation: Helping another student commit, or attempt to commit, any Academic Integrity violation, or failure to report suspected Academic Integrity violations to a faculty member.

In particular, submitting anything that is not your own work without proper attribution (giving credit to the original author) is plagiarism and is considered to be an academic integrity violation. It is not acceptable to copy source code or written work from any other source (including other students, online resources), unless explicitly allowed in the assignment statement. In cases where using resources such as the Internet is allowed, proper attribution must be given.

Any evidence of an academic integrity violation (cheating) will result in a 0 grade for the assignment/exam, and the incident will be submitted to the Department of Computer Science for further review. Note that academic integrity violations can result in a permanent notation being placed on the student's transcript or even expulsion from the University. Evidence of cheating may include a student being unable to satisfactorily answer questions asked by the instructor about a submitted solution. Cheating includes not only receiving unauthorized assistance, but also giving unauthorized assistance. For class files kept in Unix space, students are expected to use Unix file permission protections (chmod) to keep other students from accessing the files. Failure to adequately protect files may result in a student being held responsible for giving unauthorized assistance, even if not directly aware of it.

Students may still provide legitimate assistance to one another. You are encouraged to form study groups to discuss course topics. Students should avoid discussions of solutions to ongoing assignments and should not, under any circumstances, show or share code solutions for an ongoing assignment.

Any resources or examples used in completing an assignment should be acknowledged and listed in the assignment report.

All students are responsible for knowing the rules. If you are unclear about whether a certain activity is allowed or not, please contact the instructor.

More information on academic integrity is available on the my academic integrity page.

ODU Cares

Student Outreach & Support (SOS) is a service within the Dean of Students' office. SOS provides support to students who experience administrative, academic, or personal roadblocks. SOS works collaboratively with ODU's Care Team, and is here to help students achieve their personal and academic goals. To access these resources, email oducares@odu.edu.

Statement from ODU Counseling Services

ODU's Office of Counseling Services (OCS, 1526 Webb University Center) is a university agency with competent, diverse, and multidisciplinary professional staff. We are committed to supporting the emotional well-being, social development, and academic progress of all students at Old Dominion University.

College life can be a wonderful time of self-discovery, but for many, it is also a time when the awareness of mental health conditions increases. OCS services are available to assist with addressing mental health concerns that a student may be experiencing. You can learn more about the broad range of confidential mental health services available on campus via our website at http://www.odu.edu/counselingservices. All services are free to ODU students.