INFO 424: Information Visualization and Aesthetics
Autumn 2007—5 Credits, Prerequisite: CSE 143

Instructors: Maureen Stone and Polle Zellweger, guest lecturers
TA: Marilyn Ostergren, PhD student, iSchool

Lectures: T, TH 1:00 – 2:20, MGH 271
Lab: F 1:30 – 3:20, MGH 430 (attendance at lab is required)

Instructor office hours: TH 11:00-1:00 MGH 330K, or by appointment
TA office hours: T 2:30-3:30 TBD

Contact Info: mcstone@u.washington.edu , pollez@u.washington.edu,
ostergrn@u.washington.edu (response within 24 hours under most circumstances)

Course web site: http://courses.washington.edu/info424/
Course listserv: info424a_au07@u.washington.edu
Course gmail: info424@gmail.com

Course Goals

By the end of this course, students will be able to:
- Describe the key design guidelines and techniques used for the visual display of information, including their relationship to human perception
- Design interactive visualizations to support human activities, using real data and a user-centered process
- Explore and critically evaluate a wide range of visualization techniques and applications

Course Summary

This course describes the key design principles and techniques used in visualizing information, together with the perceptual principles that support them. It is structured to provide both concrete experience with real data and tools as well as a broad view of the rich world of information visualization. Students will learn both how to design and how to explore, analyze and evaluate.

Students will be required to complete reading assignments, perform exercises in design and analysis, and to work in a project team to design and simulate a rich, interactive visualization of real data. There will be no final exam.

Students will first learn in-depth the methods for displaying quantitative information (tables, graphs, and data maps), following the principles described in *Show Me the Numbers* by Stephen Few. The lectures will expand on the text to include more complex, varied and/or interactive examples. The labs in this section will feature Tableau Software's commercial tool for visual analysis, allowing the students to get hands-on experience with real data. This section will culminate with the students applying these principles to their own project data.

The second part of the course will build on this foundation to explore information visualization in the context of interaction, design and perception. The primary text forthis

section is Edward Tufte's *Envisioning Information*, supplemented by additional readings on specific topics or systems. The lectures will support the readings, and may include in-class discussions, exercises, and student presentations. The labs in this section are integrated with the project design process and milestones. This section culminates with the student project presentations, which will be presented in class the last week of class.

Textbooks and Readings

Required texts:

1. Few, Stephen. (2004). *Show Me the Numbers: Designing Tables and Graphs to Enlighten*. Cheshire, CT: Graphics Press.
2. Tufte, E. R. (1990). *Envisioning Information*. Cheshire, CT: Graphics Press.

Texts are available from the University Bookstore, other local bookstores, or from online sources like Amazon.

Additional readings: In addition, students will be given readings that include technical articles and chapters from other texts. All will be provided in PDF form for download from the course website.

Overview of Grading

Grades will be determined as follows:

45%   Project related activities (25-30% group, 15-20% individual)

45%   5-7 additional assignments

10%   Class participation

Grading for the course will match the ranking criteria supplied by the iSchool Guidelines applied to our expectations for a 3-4th year undergraduate.

Coursework

Coursework entails readings, computer labs, assignments, projects, and class participation in lectures and labs. Attendance is expected for all lectures and labs. If you miss a class, you are expected to make up the work on your own. For each hour of class time you should plan for 1.5 to 3 hours of work outside of class; so, roughly, 8 to 15 hours of outside work each week. Remember that this course is a five-credit class.

Assignments: Many assignments will include an activity in a Friday lab, so attendance at the labs is crucial. All assignments are to be submitted via email to info424@gmail.com. All assignment write-ups, which include the assignment's point value, criteria and due dates, will be available from the course website.

Readings: You are expected to do the readings for each class prior to attending lecture, which will summarize and expand on the material covered. Each reading assignment will include a set of reflective questions for you to consider as you read. While a written response is not required, careful attention to these questions will facilitate understanding, and improve your performance on the assignments and project. Students are encouraged to send questions and comments on the readings to info424@gmail.com for possible

consideration and discussion in the lecture. Email must be received by 7:30 am on the day of the lecture. Participation in this manner will contribute to the class participation part of your grade.

Project: The goal of the project is to apply what you are learning in this course to a real set of data of interest. The project is a substantial part of your grade, and will be the primary task for the second half of the course. Projects are conducted in a team of 3-4 people, but there are both individual and group components to project grading. Further information can be found in the project writeup and on the class website.

Late policy

Work must be handed in on time to receive full credit. For any late assignment, 10% will be taken off your work per day. After five days, your work will not be accepted.

If for some extraordinary reason you will miss a deadline (illness, personal crisis), you should inform the instructor as soon as you can, indicating when you will submit the work. Whether to accept late work or assign late penalties is at the instructor's discretion.

Schedule

After a thorough introduction to Information Visualization, the first 4 weeks of the course will focus on the Few text, *Show Me the Numbers,* which provides an in-depth view of the principles and methods valuable for visualizing quantitative information. Topics include:

- Fundamental principles for graphical excellence and integrity, primarily those articulated by Tufte and Few, but including also those articulated by Ben Shneiderman and others from the interactive visualization community.

- Understanding data with respect to the different tasks and visualization methods it supports.

- Real world data, which includes outliers, missing values, and may need reorganizing and transforming to be visualized effectively.

- An overview of the visual and perceptual principles relevant to visualization

- Few's specific rules and techniques for clearly communicating the information encoded in numeric data.

This section includes most of the non-project assignments, and culminates with an assignment designed to test your understanding of these principles.

The next 4 weeks alternate between topics from Tufte's *Envisioning Information* and topics concerning interactive visualization systems. The labs and assignments are primarily project milestones. Topics include:

- Techniques for managing complexity: Overview plus detail, small multiples, animation, layering

- The perception and application of grayscale and color to label, layer and to control attention, including visual accessibility issues.

- Visualization methods using maps

- Visualization methods for trees and networks

- Interaction methods for control, selection and navigation

- Usability and evaluation

After Thanksgiving, the primary focus of the course is the projects, which will be presented in class the last week of classes. Other class times will be used for enrichment lectures, such as guest speakers or design studies.

 See class website for full details.

Integrity and Conduct

Students are expected to follow the University of Washington's policy on Academic Honesty and Student Code of Conduct.

Right to revise

The instructors reserve the right to revise this syllabus.