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Ω	COMP 401	Senior Seminar	Ω
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<i>T-R</i>		<i>Seminar/Lecture – 11:00-12:20</i>	

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Who: Michael Gousie  
Where: Science Center 1325  
When: Mon 2:30-3:30; Wed 1:30-3:00; Thu 3:30-4:30  
and by appointment  
E-mail: [mgousie@wheatoncollege.edu](mailto:mgousie@wheatoncollege.edu)  
Web: <http://cs.wheatoncollege.edu/mgousie>

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**Recommended Texts:**

Jon Duckett. *HTML and CSS: Design and Build Websites*, John Wiley & Sons, 2011.  
David Flanagan. *JavaScript: The Definitive Guide*, 6<sup>th</sup> Ed., O'Reilly, 2011.  
David Murray. *Interactive Data Visualization for the Web*, O'Reilly, 2013. Tutorial available online.  
Patrick J. Lynch and Sarah Horton. *Web Style Guide*, 3<sup>rd</sup> Ed., Yale University Press, 2008. Online.

**Course References:**

We will look at excerpts from the following sources:

Edward Tufte, *The Visual Display of Quantitative Information* (Graphics Press, 1983) [on reserve].  
Edward Tufte, *Envisioning Information* (Graphics Press, 1990) [on reserve].  
Edward Tufte, *Visual Explanations* (Graphics Press, 1997) [on reserve].  
Edward Tufte, *The Cognitive Style of PowerPoint* (Graphics Press, 2003) [on reserve].  
Edward Tufte, *Beautiful Evidence* (Graphics Press, 2006) [on reserve].  
Colin Ware, *Information Visualization*, 2nd Edition (Morgan Kaufmann, 2004).  
Steve McConnell, *Rapid Development* (Microsoft Press<sup>1</sup>, 1996)  
Various Software Engineering texts and visualization articles.

**Course Content**

**Seminar** \Sem'i\*nar\", n. [G. See Seminary, n.]

A group of students engaged, under the guidance of an instructor, in original research in a particular line of study, and in the exposition of the results by theses, lectures, etc.; – formerly called also seminary, now seldom used in this sense.

Much of this course will follow the definition of a seminar, under the topic of visualizing information. You will work on a research project as part of a team. The project involves creating quantitative visualization (better described as *information visualization*) that you will implement as a dynamic web application. The project will be defined by an outside “client,” who will visit the class and describe the problem to be solved. Your team will work with the client on the details of the visualization and create a prototype. You will then “pitch” your prototype to the client. After gathering responses to your ideas, your team will implement the system and present the finished product at the end of the semester. Along the way, we will investigate and practice some software engineering principles, consider various visualization systems, and discuss visualization research papers.

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<sup>1</sup>Yes! Microsoft!

**Grading:**

There will be various types of assignments in this course. You will write three web applications dealing with visualization problems, the last of which is the large team project. As part of the project, the group will write multiple versions of a Detailed Functional Specification (DFS). The group will do a formal presentation of its final project in front of the client and the general public. All of the web applications will be implemented with HTML5, CSS, JavaScript, and D3.js; other tools may be used as well, such as SQL, etc. Each student is also responsible for three individual, short, in-class presentations, in which the complexities of a research paper are disseminated. You are expected to contribute to all in-class discussions. The breakdown of points follows; note that there are times when assignments overlap.

What	Weight	Due Date
Vis 1	6%	February 16
Detailed Functional Specification (DFS) v1.0	5%	March 1
Project proposal presentation	15%	March 3
DFS v2.0	5%	March 8
Vis 2	10%	March 11
Short presentation 1	5%	March 24
Project mock up/prototype	–	March 31
Short presentation 2	7%	April 7
Parts of working project	–	April 14
Short presentation 3	7%	April 28
Final client presentation/Vis 3	35%	May 5
In-class participation, miscellaneous	5%	TBD

Grades will be assigned according to the following scale:

A = 93-100, A- = 90-92, B+ = 87-89, B = 83-86, B- = 80-82, etc.
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**Course Policies:**

- You are responsible for all material covered in class.
- You are responsible for all reading assignments as assigned/handed out in class.
- The projects will be implemented using various Web technologies. You may use any platform for development. The projects must be uploaded to the server and/or emailed by the due date, and work properly using Firefox.
- All reports and papers must be done on a word processor or formatted using  $\LaTeX$ , as well as checked for spelling and grammar.
- Individual grades on group projects will be decided by team members splitting the total points received as they see fit (up to a high of 100).
- Assignment due dates are FIRM.
  - All programming projects must be submitted electronically by 11:59:59 PM on the due date unless otherwise noted. Projects submitted on the following day will receive a 15% penalty. Anything turned in later will receive a 0. Hard copy, if required, must be submitted at the beginning of class on the next day, or as instructed on the specification sheet.

- Written homeworks/papers must be submitted at the beginning of class on the due date. There is no provision for late homework.
- You are expected to adhere to the Honor Code.
  - Although *discussion* of assignments is encouraged, the *implementation* of programs is to be the result of your, or your group's, own work. Any copying of programs or portions of programs that is not fully documented and discussed as such will result in a 0 for that assignment or failure of the course.
  - Written homework/papers should absolutely be your own work. Copying of homeworks will result in a 0 for the homework portion of the grade or failure of the course.
- **The use of a laptop or other computer/pad is not allowed during lecture or discussion**, unless the day's lesson requires it. Special arrangements can be made if necessary.
- The use of cell phones, iPods, and other personal electronic devices is prohibited during class and exams.
- Please, not eating during class.
- Please do not disrupt class by leaving/returning, unless there is an emergency. **A phone call or text does not constitute an emergency.**

**Detailed Course Schedule** (Subject to change):

Wk #	Date	Topic(s)	Reading	Due
	Jan			
1	28	Introduction; what are we doing?		
	Feb			
2	2 4	HTML5, CSS JavaScript	<i>Web Style Guide</i> , Web links Web links	Résumé, cover letter
3	9 11	XML, D3 Initial client meeting	Handouts	Open mind
4	16 18	Intro to visualization systems, Tufte does rocket science Visualization examples	PowerPoint <sup>yikes!</sup> ; Web links	Vis 1  Vis sample
5	23 25	Software engineering I; functional specifications Project discussion	Handouts	  Ideas
	Mar			
6	1 3	The power of PowerPoint? Client project proposal presentation	<i>The Cognitive Style of PowerPoint</i>	DFS v1.0 Marketing pitch
7	8 10	Project discussion, Tufte More Tufte, FlowingData	<i>The Visual Display of Quant. Info.</i> Web links, <i>Visual Explanations</i>	DFS v2.0 Vis 2 (Friday)
8	15 17	<b>SPRING BREAK</b> <b>SPRING BREAK</b>	Islands Guidebook	Corona bottle
9	22 24	How to read a research paper I  Tufte class discussions	<i>Visualizing Crowds ...</i> , <i>CompSurf: An Environment for ...</i> , <i>Visualizing Trends and Clusters ...</i> , <i>A (sic) Empirical Study of Web- ...</i> <i>Envisioning Information</i> , <i>Beautiful Evidence</i>	  Short presentation
10	29 31	How to read a research paper II  Client project progress meeting	<i>Continuous Parallel Coordinates</i> , <i>Scattering Points in Parallel ...</i> , <i>Visualization of DEM Error</i> , <i>Augmenting Grid-Based ...</i>	  Mockup/prototype
	Apr			
11	5 7	Software engineering II Visualization paper presentations I	<i>Rapid Development</i> Your choice	Copy of article Short presentation
12	12 14	Software engineering III Project progress meeting	<i>Rapid Development</i>	<i>Something working!</i>
13	19 21	Visualization topics I Visualization topics II	<i>Information Visualization</i> FlowingData	
14	26 28	Career preparation Visualization paper presentations II	TBD	Copy of article Short presentation
	May			
15	3 5	Project finalization Final presentation for client		Vis 3