

**CSC 465 Syllabus  
Fall 2015**

**Dr. John McDonald**

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**Course Summary:**

An introduction to data visualization techniques to enhance the exploration and analysis of large data sets from a wide range of fields including commercial, financial, medical, scientific and engineering applications. Topics will include visual encoding of numeric data, effective visualization design, graphical integrity, visualizing distributions and correlation, false-color techniques for feature extraction and enhancement, basic network graph visualization, isosurface generation, geospatial visualization and volumetric rendering techniques. The course will explore both extant visualization software packages and code interfaces for data visualization.

**Textbooks and Printed Resources:** The following texts are required for the course:

- William Cleveland, The Elements of Graphing Data, ISBN-13 978-0963488411
- Oscar Perpinan Lamigueiro, Displaying Time Series, Spatial, and Space-Time Data with R, ISBN 978-1466565203

Also, as the following books are recommended depending on your interests

- Edward Tufte, The Visual Display of Quantitative Information, 2nd Edition, ISBN-13 978-0961392147
- Winston Chang, R Graphics Cookbook: Practical Recipes for Visualizing Data, Publisher: O'Reilly Media, December 2012
- Antonio Siciliano, MATLAB Data Analysis and Visualization, ISBN-13 978-9812837516
- Scott Murray, Interactive Data Visualization for the Web, see <http://chimera.labs.oreilly.com/books/1230000000345/index.html>

**Prerequisites:** PREREQUISITE(S): IT 403 and (CSC 401 or IT 411)

This course assumes that you have had a basic course in statistics along with an introductory programming course (e.g. Python or Javascript)

**Grading:**

Work in this course will be evaluated through weekly/biweekly homeworks, a midterm exam and a final project. The breakdown for the grading will be

- Homeworks 35%
- Midterm 30%
- Final Project 35%

Homeworks will be submitted online on the D2L website. No e-mail submissions will be accepted. Homeworks submitted after the due date will come with an automatic 20% penalty. No homework will be accepted more than one week beyond the due date for the assignment.

The midterm will be held on the sixth week of class, February 8th. Makeups for the midterm will only be given in extreme circumstances and request for a makeup must be made at least a week before the midterm and documentation for the reason must be supplied. Makeups will be oral, and you must take the midterm to pass the course.

The final project in the course will be a group effort to build an original collection of visualizations for some data set. It will be up to your group to find an appropriate dataset. I will be providing a list of sites that have good datasets, though if you are interested in working on a data set of your own, please do come and see me about it. I do encourage you to work on outside data sets, but we need to make sure that the dataset will provide enough material for the final project and will be doable in the time limits of the course.

You will present your final project on the 10<sup>th</sup> week of class, March 7<sup>th</sup>, and then will have until the final exam date to submit your final report. Take note of this date when you are making your spring break plans, because failure to present your project on this date will result in a failing grade for the course.

#### **A note about final project groups and non-performance as a team-member on a project:**

The final project in this course is very broad in its scope allowing your group to focus on a wide range of dataset types for visualization, and on a wide range of techniques for visualizing the data. Group members are expected to participate fully and equitably in the group, and part of the final project grading rubric will be a peer evaluation that will form part of the final project grade.

Usually, the peer evaluation and documentation, including the meeting minutes, in addition to an overall desire for excellence, is sufficient motivation for individuals to contribute a fair share to the team project. However, in extreme cases, individuals have been known to completely cease contributing to a team project. If this is the case, a team has the right to notify the instructor **unanimously (other than the individual being sanctioned)** that the individual is no longer contributing and the team no longer wants the individual on the team.

It is expected that a team will be able to show significant effort towards reconciling the issue prior to such an extreme action. Note also that this is not a decision to be made lightly, as expulsion from a team will result in **the loss of 40% of the of the final project grade**, i.e. the group portion of the grade, for the person expelled. Because this is such a serious decision, any team that makes this decision will also experience a deduction of **10% of the final project grade**.

#### **Attendance and Participation:**

Attendance (watching the lectures for online students) will count towards your participation score, as will participation in the online forum. You are expected to participate in online discussions with your peers. One of the most important parts of a class is building a learning community. I will be expecting you to be available to help each other with constructive suggestions.

The online discussion forums will be made available for you to discuss course topics and current trends in graphics. Inappropriate behavior, such as rude responses will be noted and will count against your participation score. Note also that posting of solutions is forbidden and will result in the forum being shut down, and also may constitute an academic integrity violation. You may give suggestions for how to attack a problem, and may discuss strategies, but code solutions are not to be posted.

### **What to Expect:**

In this class you should expect to spend a significant amount of time outside of class reviewing course materials and topics and working on homework problems. Throughout the course, I may distribute handouts of notes on various topics, and certain in-class materials including sample programs will be available on the class website. Nevertheless you are expected to take comprehensive notes during class and to review those notes in preparation for the next class.

### **Attitude and Civil Discourse:**

A professional and academic attitude is expected throughout this course. Measurable examples of non-academic or unprofessional attitude include but are not limited to: talking to others when the instructor is speaking, mocking another's opinion, cell phones ringing, emailing, texting or using the internet whether on a phone or computer. If any issues arise a student may be asked to leave the classroom. The professor will work with the Dean of Students Office to navigate such student issues.

DePaul University is a community that thrives on open discourse that challenges students, both intellectually and personally, to be [Socially Responsible Leaders](#). It is the expectation that all dialogue in this course is civil and respectful of the dignity of each student. Any instances of disrespect or hostility can jeopardize a student's ability to be successful in the course. The professor will partner with the Dean of Students Office to assist in managing such issues.

### **Cell Phones/On Call:**

If you bring a cell phone to class, it must be off or set to a silent mode. Should you need to answer a call during class, students must leave the room in an undistruptive manner. Out of respect to fellow students and the professor, texting is never allowable in class. If you are required to be on call as part of your job, please advise me at the start of the course.

### **Changes to Syllabus**

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

### **Online Course Evaluations**

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course

content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in [CampusConnect](#).

### **Academic Integrity and Plagiarism**

This course will be subject to the university's academic integrity policy. More information can be found at <http://academicintegrity.depaul.edu/>. If you have any questions be sure to consult with your professor.

### **Academic Policies**

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the [University Academic Calendar](#). Information on enrollment, withdrawal, grading and incompletes can be found at: [cdm.depaul.edu/enrollment](http://cdm.depaul.edu/enrollment).

### **Students with Disabilities**

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: [csd@depaul.edu](mailto:csd@depaul.edu).

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