

## CSCE 567: VISUALIZATION TOOLS

### **Catalog Description:**

**567—Visualization Tools.** (3) (Prereq: CSCE 145 or 206 or 207) Scientific visualization tools as applied to sampled and generated data; methods for data representation and manipulation; investigation of visualization techniques.

### **Prerequisite(s) By Topic:**

Introductory programming and data structures

### **Textbook(s) and Other Required Material:**

Stuart K. Card, Jock D. Mackinlay, and Ben Shneiderman, *Readings in Information Visualization: Using Vision to Think*, Morgan Kaufmann, 1999.

**Computing Platform:** Unix, Windows XP

**Course Objectives:** {Assessment Methods Shown in Braces}

1. Understand the potential uses of visualization tools in data analysis and presentation {presentations, reviews, discussions}
2. Use visualization tools in data analysis {projects}

### **Topics Covered:**

1. Space: ID, 2D, 3D, >3D (6 hours)
2. Space: Trees (3 hours)
3. Space: Networks (3 hours)
4. Interaction: Queries (6 hours)
5. Interaction: Analysis (6 hours)
6. Focus: Visual Transfer Functions (6hours)
7. Document Visualization (6 hours)
8. Workspace (6 hours)

### **Laboratory Projects and Other Student Work:**

Students complete several projects, at least one of which is substantive. They also review, present, and discuss research papers.

### **Difference between Undergraduate and Graduate Work:**

Graduate students have more (or longer) presentations. They also complete more complicated projects.

**Syllabus Flexibility:** High. The instructor may select the textbook and projects.

**Relationship of Course to Program Outcomes:**

The contribution of each course objective to meeting the program outcomes is indicated with the scale:

3 = major contributor, 2 = moderate contributor, 1 = minor contributor. Blank if not related.

Course Objectives	Program Outcomes										
	1. Logic & Math	2. Computing Fundamentals	3. Apply Computing Principles	4. Work on teams	5. Communicate Effectively	6. Liberal arts & Soc. Sciences	7. Basic Science and Lab Procedures	8. Learn New Tools & Processes	9. Employed upon Graduation	10. Application Area	11. Electronics and Digital Sys Design
1. Understand the potential uses of visualization tools			3	1	3			3		1	
2. Use visualization tools in data analysis			3	1	3			3		1	

**Estimated Computing Category Content (Semester hours):**

Area	Core	Advanced	Area	Core	Advanced
Algorithms		1	Data Structures		1
Software Design		1	Programming Languages		
Computer Architecture					

**Estimated Information Systems Category Content (Semester hours):**

Area	Core	Advanced	Area	Core	Advanced
Hardware and Software		1	Networking and Telecommunications		
Modern Programming Language			Analysis and Design		1
Data Management		1	Role of IS in an Organization		
Quantitative Analysis			Information Systems Environment		

**Oral and Written Communication:** None

**Social and Ethical Issues:** None

**Theoretical Content:**

Some use of statistics and mathematical models in implementing and evaluating visualization tools

**Analysis and Design:**

Visualization projects using existing tools

**Class/Laboratory Schedule:**

Lecture: 3 periods of 50 minutes or 2 periods of 75 minutes per week

**Course Coordinator:** John Rose

**Modification and Approval History:**

Initial description, April 20, 2001

Modified June 2005 by Caroline Eastman using course materials from John Rose