

1. Course number and name

CptS 438: Scientific Visualization

2. Credits and contact hours

3 credits, 3 lecture hours

3. Instructor's or course coordinator's name

Robert R. Lewis

4. Textbook, title, author, and year

Thompson, Brown, and Ford. 2004. *OpenDX Paths to Visualization*. VIS, Inc. ISBN 978-0779500154.

5. Specific course information

- a. *Catalog description:* Data taxonomy; sampling; plotting; using and extending a visualization package; designing visualizations; domain-specific techniques.
- b. *Prerequisites or corequisites:* Math 172 (Calculus II); CptS 223 (Advanced Data Structures) CptS 224 (Programming Tools)

6. Specific goals for the course

By the end of the course, students will be able to

- Analyze and describe the attributes of the data to be visualized evaluate alternative mappings of data elements to visual attributes assess the quality of a visualization (6a)
- Translate data formats into a form suitable for a visualizer (1c)
- Extend a visualizer to provide additional functionality (2g)

7. Brief list of topics to be covered

- Introduction and Data Taxonomy
- Sampling and Filtering
- 2-D Plots: Basic Visualization
- The OpenDX Visualizer
 - Using the GUI
 - The Data Model
 - Using Module
 - Building Module
- Designing Visualizations
 - Choosing Visualization Mappings
 - Static, Animated, and Steerable Visualizations
 - Dimensional Reduction
- Applications
 - Volume Visualization
 - Molecular Visualization
 - Geographical Visualization
 - Graph Visualization

- Information Visualization