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**  

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