

Course Title: **Advanced Applications in Scientific Visualization**
Course Number: **9400130**
Course Credit: **1**

Course Description:

This course provides students with instruction in advanced imaging techniques relative to both static and dynamic visualization. In addition to digital imaging, students receive instruction in video editing and the integration of animated 3-D rendered data model. Students will create visualizations related to biological cells, plate tectonics, DNA and gel electrophoresis, and one of simple machines. The ultimate output of this course is a portfolio created by the student from a scenario. The portfolio should include a narrative description of the scenario, the approach to data collection, resulting renderings, and an interpretation of each chart/graph. Research references should be cited appropriately. Given the advanced nature of this course and the need to illustrate skills in dynamic renderings, students should produce the portfolio using presentation software suitable for dissemination via the Internet.

CTE Standards and Benchmarks	NGSSS-Sci
62.0 Apply advanced tools of visualization. – The student will be able to:	
62.01 Describe how computers store information.	
62.02 Define how to apply pixel values to digital images.	
62.03 Apply pixel values to digital images.	
62.04 Identify trends in scientific and technical visualization tools.	
63.0 Demonstrate advanced principles of visualization. – The student will be able to:	
63.01 Recognize advanced 2D design concepts.	
63.02 Describe advanced imaging techniques.	
63.03 Identify advanced presentation techniques.	
63.04 Demonstrate advanced presentation techniques.	
63.05 Identify basic web page design.	
63.06 Demonstrate basic web page design.	
64.0 Demonstrate advanced visualization processes. – The student will be able to:	
64.01 Summarize advanced 3D modeling.	
64.02 Interpret advanced animation techniques.	

CTE Standards and Benchmarks	NGSSS-Sci
64.03 Describe video-editing techniques.	
64.04 Demonstrate video-editing techniques.	
65.0 Demonstrate advanced scientific visualization. – The student will be able to:	SC.912.L.14.1, 2; 16.3, SC.912.E.6.3
65.01 Recognize cells and their parts.	
65.02 Create a visualization of the cell and its parts.	
65.03 Recognize plate tectonics.	
65.04 Create a visualization of plate tectonics.	
65.05 Describe DNA and gel electrophoresis.	
65.06 Create a visualization of DNA and gel electrophoresis.	
65.07 Explain different simple machines.	
65.08 Create a visualization of simple machines.	
65.09 Create an advanced visualization.	
66.0 Demonstrate preparedness for the future. – The student will be able to:	
66.01 Summarize different types of portfolios.	
66.02 Synthesize an electronic portfolio.	
66.03 Create an electronic portfolio of their work.	