MISSOURI WESTERN STATE UNIVERSITY

SCHOOL OF LIBERAL ARTS AND SCIENCES

DEPARTMENT OF COMPUTER SCIENCE, MATHEMATICS, AND PHYSICS
Undergraduate Program

COURSE NUMBER: CSC328
COURSE NAME: COMPUTER GRAPHICS

COURSE DESCRIPTION:

A course in the techniques for picture transformation structure; organization of graphical systems; use of the microcomputer as tools for displaying g, curve and surface approximation; study and implementation of graphical languages and data raphical data.

PREREQUISITES:

A grade *of* C or higher in CSC 285 and either MAT 137 or MAT 167.

TOPICS COVERED:

- Introduction, Motivation, Uses, History
- Graphics Systems and Models
- Graphics Programming : Getting started with OpenGL
- Input and Interaction in OpenGL
- Geometrical Objects and Transformations in 2D and 3D, homogeneous coordinates, matrix representation, windows and viewports
- Viewing in 3D, projections, hidden surface removal
- Light, shading and materials. Illumination and Shading, light sources, (surface detail, ray tracing, radiosity)

ADVANCED TOPICS:

- Vertices to Fragments : modeling, geometry processing, rasterization, fragment processing. Clipping, hidden surface removal, antialiasing.
- Discrete techniques: buffers, bit and pixel operations, texture mapping, compositing.
- Programmable shaders : OpenGL shading language, fragment shaders, cub and bump maps.
- Modelling Techniques, trees, scene graphs.
- Curve and surface representation
- Advanced rendering techniques: ray tracing, radiosity, image based rendering.

REQUIRED TEXTS:

This course does not require any textbooks.