University of Arkansas – Fort Smith
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General Syllabus

CS 3323 Computer Graphics

Credit Hours: 3   Lecture Hours: 3   Laboratory Hours: 0

Prerequisite: CS 2003 Data Structures

Effective Catalog: 2018- 2019

I.   Course Information

A. Catalog Description
Examines the generation and manipulation of computer images and digital media. Topics include basic theories and concepts around computer graphics, hardware, geometric modeling, and display algorithms and data structures.

B. Additional Course Information
This course is used to satisfy the requirements for the Data Analytics Concentration in the Information Technology degree. It may also be used as an upper level elective in all other concentrations of the IT degree.

II.   Student Learning Outcomes

A. Subject Matter
Upon successful completion of this course, the student will be able to:

1. Analyze the common uses of digital media and graphics.
2. Explain, design and utilize the basic concepts of computer graphics.
3. Assess how the limits of human perception affect choices about the digital representation of analog signals.
4. Evaluate the differences between lossy and lossless image compression techniques.
5. Create and implement various graphics transformations and filters.
6. Analyze and explain the concept and applications of texture mapping, sampling and anti-aliasing.
7. Create programs that use various modeling approaches with respect to space and time complexity and quality of image.

B. University Learning Outcomes
This course enhances student abilities in the following areas:

Communication Skills (written and oral)
Students will apply programming documentation, demonstrations and technical explanations to concepts and code execution.

Analytical Skills
Critical Thinking Skills: Students will design algorithm requirements and properties to implement the appropriate programming code solution or application implementation to solve the given problem.

III.   Major Course Topics

A. Fundamentals of Computer Graphics
B. Mathematics for Computer Graphics
C. Digital Media
D. Lossy and Lossless Compression Algorithms
E. Basic Rendering and Techniques
F. Geometric Modeling
G. Animation
H. Composition
I. OpenGL