The University of Texas at Tyler  
Master of Science in Computer Science  

Course Syllabus

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<th>Course Number:</th>
<th>COSC 5345</th>
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<td>Course Title:</td>
<td>Computer Graphics</td>
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**Course Description:**
An introduction to computer graphics stressing interactive graphics. Basic theory and applications will be covered. Open GL graphics and concepts in 3-D graphics will be given.

**Pre-requisites:**

**Credits:**


**Languages Used:**
C with Open GL graphics package

**Topics:**

1) Introduction 3 hours
2) Hardware for Graphics Systems 3 hours
3) 2-D Transformations, Window, Viewport, Clipping 15 hours
4) OpenGL Graphics Package and graphics programming techniques. 6 hours
5) 3-D Transformations, Projection equations, representation of 3-D shapes 12 hours
6) 3-D Surfaces-Polygon Mesh, Parametric Cubic Patches Interactive Graphics 3 hours

**Evaluation Method:** (only items in dark print apply)

1. Examination/Quiz
2. Homework
3. Paper/Report
4. Computer Program
5. Project
6. Presentation
7. Class Participation
8. Peer Review
9.  
10.  

**Additional Materials:**
### Course Objectives

By the end of this course students are expected to:

1. Explain the difference between vector graphics and raster graphics [1,7]
2. Explain mapping of two-dimensional objects from the window to viewport [1,7]
3. Analyze and demonstrate two-dimensional transformations such as translation, scaling, shear, reflection, and rotation[1,7,4]
4. Explain with mathematical equations how three dimensional objects in the world coordinate system are mapped to a two dimensional viewport [1, 7].
5. Analyze transformations such as translation, rotation, scaling, reflection, and shear for three dimensional objects with homogeneous coordinate system [1, 4, 7].
6. Explain the concept of viewing pyramid and projection methods such as perspective projection and parallel projection [1, 4, 7].
7. Build a software system to map wire objects in the world coordinate system to the viewport to produce view of objects from multiple viewpoints [4].
8. Explain methods for representing surfaces such polygon meshes and parametric cubic patches [1, 7].

Numbers in bracket refer to method(s) used to evaluate the course objective.

### Relationship to Program Outcomes

This course supports the following computer science graduate program outcomes, which state that our students at the time of graduation are expected to:

1. possess an enhanced breadth of knowledge in computer science, combined with a depth of knowledge in critical core areas of computing; [2,3,4,5,8]
2. possess the skills and knowledge for lifelong learning in computer science;
3. possess knowledge of the theoretical foundations of computing and have strong practical application experience;[2,3,4,5,7]
4. posses and demonstrate oral and written communication skills;
5. understand and respect the professional standards of ethics expected of a computer scientist and be knowledgeable concerning the history of computing field;
6. possess a knowledge of computer security and computer security management;
7. analyze and compare relative merits of alternative software design, algorithmic approaches, and computer system organization, with respect to a variety of criteria relevant to the task (e. g. efficiency, scalability, security); [7] and
8. implement algorithms in multiple programming languages, on multiple hardware platforms, and multiple operating system environments.

Numbers in brackets refer to course objective(s) that address the Program Outcome.

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Date: 07/02/2009

Reviewed By:  
Date: