COSC 5327 Introduction to Computer Graphics  
Department of Computing Sciences  
Spring 2016

A. COURSE INFORMATION
   Course number/section:  COSC 5327.001  
   Class meeting time:  MWF 12:00-12:50PM  
   Class location:  OCNR-255  
   Course Website:  blackboard and sci.tamucc.edu/~sking/Courses/COSC4328

B. INSTRUCTOR INFORMATION
   Instructor:  Scott A. King  
   Office location:  CI 341  
   Office hours:  M 10-11:00, W 2:3:00 R 9-12:00  
   Telephone:  361 825 5877  
   e-mail:  Scott.King@TAMUCC.edu  
   Appointments:  Schedule through email. Appointments are expected to be kept and on time.

C. COURSE DESCRIPTION
   Catalog Course Description
   This graduate course provides students with a foundation in basic principles and techniques for computer graphics on modern graphics hardware. Students will gain experience in interactive computer graphics using the OpenGL API. Topics include: graphics hardware, rendering, perspective, lighting, and geometry.

   Extended Course Description
   This course will introduce students to all aspects of computer graphics including hardware, software and applications. Students will gain experience using a graphics application programming interface (OpenGL) by completing several programming projects.

   This course is an elective in the Scientific Computing and Visualization Group

D. PREREQUISITES AND COREQUISITES
   Prerequisites
   COSC 2437, MATH 2413. MATH 331.

   MATH 3311 Linear Algebra is recommended

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Textbook(s)


Optional Textbook(s) or Other References

The following books might also be useful:

- P Shirley, Fundamentals of Computer Graphics, 2e, AK Peters, 2005
- Foley and Van Dam, Fundamentals of Interactive Computer Graphics
- Moller and Haines, Real-time Rendering, AK Peters,

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Have a basic understanding of lighting
2. Understand the use of transformations and spaces
3. Be capable of using OpenGL to create interactive computer graphics.
4. Understand how a typical modern graphics pipeline works, and how to take advantage of one.
5. Use geometry and topology to model objects

G. INSTRUCTIONAL METHODS AND ACTIVITIES
This course will be a mixture of lectures, discussions, and demonstrations. The student is expected to actively participate in all class activities. The student is also expected to do outside work on assignments and to complete several pieces of software.

H. MAJOR COURSE REQUIREMENTS AND GRADING

The majority of your grade will come from programming assignments. There will be several projects using OpenGL. You will also have a larger project to create a ray tracer. There will be a midterm exam and a final exam. Programming assignments are open-ended and the student can earn extra points for them. These extra points can be used instead of any grade earned on the final exam.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Midterm</td>
<td>20</td>
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<tr>
<td>Final</td>
<td>25</td>
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<tr>
<td>Assignments</td>
<td>45</td>
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<tr>
<td>Quizzes, Class Participation</td>
<td>10</td>
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I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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<tbody>
<tr>
<td>1 Intro/ half week</td>
<td>Ch 1</td>
<td></td>
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<tr>
<td>2 Intro + OpenGL Introduction</td>
<td>Ch 5</td>
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<tr>
<td>3 OpenGL</td>
<td>Ch 16</td>
<td>Lab 1</td>
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<td>4 Interaction</td>
<td>Ch 21</td>
<td>Lab 2</td>
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<td>5 Geometry</td>
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<td>Lab 3</td>
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<td>6 Transformations</td>
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<td>7 Models/viewing</td>
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<tr>
<td>8 Modeling</td>
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<td>Lab 4</td>
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<td>9 Scenes</td>
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<tr>
<td>10 Ray Tracing</td>
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<td>Lab 5</td>
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<tr>
<td>11 Ray Tracing</td>
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<tr>
<td>12 Adv Ray Tracing</td>
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<tr>
<td>13 Midterm</td>
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<td>Lab 6</td>
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<td>14 Textures</td>
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<td>15 Geometry Shaders</td>
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<tr>
<td>Tue 08 Dec</td>
<td>8:00-10:30am Final Exam</td>
<td>Lab 7</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness

- Most quizzes are at the beginning of class for the first 5 minutes, if you are late, you may miss the quiz entirely or have less time to complete it.

Late Work and Make-up Exams

- No makeup exam without adequate doctor's excuse explaining your absence. Makeup exams will not be the same exam. If for any reason you have a conflict you must see me as soon as you know about the conflict!
- Late assignments will be marked off at a rate of: 10% for 1 day, 25% for 2 days, 60% for 3 days, 100% thereafter

Extra Credit

- Each lab has opportunity for extra credit which counts towards the assignments, and can spill over into your final grade.

Cell Phone Use

- Turn off cell phones and pagers before class. If any cell phone goes off in class, even mine, it is quiz time.

Others

- Incompletes only with documented reasons in accordance with the university policy.
- **All work must be your own, group work is CHEATING, and all group members will receive a zero**
- Unless otherwise noted, the due time will be 11:59:59PM, 12:00:01AM is 10% off.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or
plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

- **Deadline for Dropping a Course with a Grade of W (University)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at
http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage at http://sci.tamucc.edu/students/GradeAppeal.html. For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

- **Disability Services**
  The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)

- **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

**L. OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely
manner during regularly scheduled lecture periods.