Course Description

Course Home Page: http://www.cs.rit.edu/~sps/courses/cg1
Course Schedule: http://www.cs.rit.edu/~sps/courses/cg1/schedule_frame.html
Course Meeting times: T, R: 6-7:50pm – Bldg 70-1620
Course Credit Hours: 4
Course Newgroup: server = news.cs.rit.edu, group = rit.cs.courses.4003.570

This course involves the study of the hardware and software principles of computer graphics. Topics include an introduction to the basic concepts: 2-D transformations, viewing transformations, display file structure, geometric models, picture structure, interactive and non-interactive techniques, raster graphics fundamentals, 3-D fundamentals, graphics packages and graphics systems. Students use and develop a graphics software system based on an accepted graphics standard. Programming projects are required.

Contact Information

Instructor’s Name: Sean Strout
Instructor’s Office: 70-3637 (Golisano, 3rd floor, East side)
Instructor’s E-mail: sps@cs.rit.edu
Instructor’s Home Page: http://www.cs.rit.edu/~sps
Instructor’s Office Hours: M: 2-4pm, W: 1-3pm
Instructor’s Schedule: http://www.cs.rit.edu/~sps/schedule_frame.html

Prerequisites

The following courses are prerequisites for Undergraduates:
  • ICSS 4003-231: Computer Science 1
  • ICSS 4003-232: Computer Science 2
  • ICSS 4003-233: Computer Science 3
  • ICSS 4003-334: Computer Science 4

The following courses are prerequisites for Graduates:
  • ICSS 4003-707: Advanced Programming

Please see me as soon as possible if you haven't reached this level. If you aren't at least a third-year student, or you have not come through an equivalent preparatory programming sequence, there is a very good chance that you don't have sufficient programming experience to allow you to succeed in this course.

Textbook

There is one required textbook for the course. All other material for the course will come in the form of slide presentations, notes and online tutorials. I have also selected optional reference textbooks for C, C++ and OpenGL.
*** MANDATORY ***

Title: Computer Graphics with OpenGL 3/E  
Author: Donald Hearn and M. Pauline Baker  
ISBN: 0-13-015390-7  
Publisher: Prentice Hall  
Copyright: 2004

*** OPTIONAL ****

Title: The C++ Programming Language (Special 3rd Edition)  
Author: Bjarne Stroustrup  
Publisher: Addison-Wesley  
Copyright: 2000

Title: C: A Reference Manual (Fifth Edition)  
Author: Harbison & Steele  
Publisher: Prentice Hall  
Copyright: 2002

Author: OpenGL Architecture Review Board  
Publisher: Addison-Wesley  
Copyright: 1999

### Grading Policy

This course consists of the activities shown below, which are weighted as indicated to compute the final grade:

**Undergraduate**

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<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Project 1</td>
<td>15%</td>
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<tr>
<td>Project 2</td>
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<tr>
<td>Project 3</td>
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<tr>
<td>Project 4</td>
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<tr>
<td>Midterm Exam</td>
<td>15%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
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Graduate

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<td>Project 2</td>
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<tr>
<td>Midterm Exam</td>
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<tr>
<td>Final Exam</td>
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<tr>
<td>Research Report</td>
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Numerical grades will be converted to letter grades according to the following scale:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Numerical Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
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<tr>
<td>B</td>
<td>80-89%</td>
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<tr>
<td>C</td>
<td>70-79%</td>
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<tr>
<td>D</td>
<td>60-69%</td>
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<tr>
<td>F</td>
<td>0-59%</td>
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</tbody>
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**Lecture Notes**

All lecture notes are available in .pdf format by selecting the Notes button in the menu bar to the left of the course homepage. You will need to install Acrobat Reader on your system to view these files. All notes are password protected and I will provide you with access information at the start of the quarter. Lecture notes will typically be available two hours before class begins. I will also provide you with hard copies in class. If you miss a class and want access to hard copies, look outside my office bin folder. I will typically keep extra handouts from the past several weeks in there.

**Project Assignments**

There will be four substantial programming projects throughout the quarter. These projects must all be coded in C or C++, using the GBA or OpenGL. The projects write-ups will be available off the course web page under the Projects link (http://www.cs.rit.edu/~sps/courses/cg1/projects_frame.html). Although you will be using your creative, artistic talents in doing the user portions of your programming assignments, most of the work will involve programming the underlying graphics routines. This course requires a significant amount of programming. You may wish to reconsider whether you want to take additional programming courses along with it.

Significant effort must be put into each project. You must submit a solution, on time, which compiles and shows reasonable effort, or else you will automatically fail the course. Please do not wait until the last minute to notify me of serious problems with your project. I recommend starting your projects well in advance of the due date, and to come and talk with me if you have any questions or problems. I am more than happy to sit down at a terminal and look over your projects with you — to debug, troubleshoot and provide assistance. The due date for the project is a hard deadline and I will not accept late submissions.
Midterm

The midterm exam is a 2 hour exam and is worth 15% of your final grade. The exam is closed book and notes. The date of the midterm will be announced around the second or third week of the quarter. The graduate and undergraduate versions of the exams may not be the same. A somewhat deeper understanding of the material is expected of the graduate students.

You are expected to take exams during the scheduled period. In general your instructor will not give make-up exams. However, some situations might arise that would prevent you from taking the exam: severe illness, accidents, family emergencies, etc. Should this occur, you must inform your instructor prior to the exam. You can either email your instructor, or leave a message with the staff in the Computer Science Department office (tel. 585.475.2995). Once you return, your instructor will make specific arrangements regarding the missed exam. If you miss an exam and did not make prior arrangements for a makeup, you will receive a zero for it.

Final

The final exam is 2 hours and is worth 25% of your final grade. The final exam is comprehensive and is closed book and notes. The final will be administered during the regularly scheduled final exam period. The date of the final will typically be announced during the sixth or seventh week of the quarter. The graduate and undergraduate versions of the exams may not be the same. A somewhat deeper understanding of the material is expected of the graduate students.

RIT’s Academic Senate approved new Final Examination Policies on May 3, 2001. Here is a brief summary of the revised policy.

Research Report

Each graduate student is expected to research a current topic relative to computer graphics and prepare a 10-15 page report. You should pick a topic that interests you enough that to do some detailed research on. I expect you to use current research articles that have been published within the last 5 years. The Wallace Memorial Library is an excellent resource. They have many publications and research databases at your disposal. Our college representative is Roman Koshykar. He is an excellent resource who is willing to show you around the library. I will try to schedule a group orientation meeting with Roman sometime during the quarter when all interested graduate students can attend.

In addition to the written report, you must also submit a working program that demonstrates some aspect of your research topic. The program must be written entirely by you. You will be submitting a proposal for the paper and the project early in the quarter. See me if you have any questions.

Class Participation and Attendance

While class participation and attendance is not directly baked into the final grade calculation, it can be a determining factor when your final grade is “on the bubble”. In this instance, students who make the effort to attend all the classes and participate in class discussions will be awarded the higher grade. It is also common for bonus points to be awarded to class participants on random days when attendance is sluggish.

Disputing Your Grade

If you feel that an error was made in grading your project or exam, you have one week from the moment the graded work was handed back to dispute your grade. It is best to contact me in person with the disputed assignment in hand, either directly after class or during office hours. If, for some reason, you are unable to meet within the allotted timeframe, please send e-mail.

Academic Dishonesty

The DCS Policy on Academic Dishonesty will be enforced.

You should only submit work that is completely your own. Failure to do so counts as academic dishonesty and so does being the source of such work. Submitting work that is in large part not completely your own work is a flagrant violation of basic ethical behavior and will be punished in accordance with the DCS Policy.
Those who behave in a dishonest or unethical manner in computer science courses, or in their dealings with the DCS, are subject to disciplinary action. In particular, dishonest or unethical behavior in the execution of assigned work in a computer science course will be treated as follows:

1. For a first offense, the student involved will receive a grade of zero on the assignment. [A stronger penalty may be exacted, if, in the judgment of the instructor, the offense involves a flagrant violation of basic ethical standards.]
2. For a second offense in the same or a different course, the student will receive a failing grade for the course.
3. A third offense will be referred to judicial affairs.

Furthermore, the following action will be taken for each person involved in the incident, whether currently enrolled in the course or not:
- If the student is a computer science major, a letter recording the incident will be placed in the students departmental file.
- Otherwise, the letter will be forwarded to the student’s department chair or program coordinator.

I do not discourage you from seeking help from other students. It is an important part of your school career to build good working relationships with your fellow classmates. The responsibility is on you to use your best judgment when receiving help such that it does not alter the work you submit as being anything but your own.

**Getting Help**

There are many people on campus who are both willing and able to help you when you have trouble understanding something. Resources include: your instructor and lab assistants.

- **Instructor** – At times your instructor can be one of the most under utilized resources at your disposal. Despite what some people may say, your instructor is on your side and wants to help you succeed. But you must make the effort to seek extra help! Do not be afraid to communicate with your instructor – either verbally and/or through e-mail. Your instructor has assigned office hours when they are committed to being available to students for any questions or problems that they may have. No matter how busy someone appears to be, their office hours are there for you and you are always welcome. Your instructor is also available by prior appointment if you can’t come during an office hour - please check their personal schedule for “By Appt” times and contact them in advance.
- **Lab Assistants** – A lab assistant is on duty whenever the CSL is open. The lab assistant monitors the lab, retrieves listings printed on the high speed printers and plays nethack whenever humanly possible. The lab assistant is a curious beast, well suited to the cold, harsh environment known as the computer laboratory. Nothing makes the lab assistant happier than answering your questions about UNIX problems, workstation issues, simple programming language problems, and where the curly brace should go in C code.

**Revision History**

- v1.00, 8/27/2003 4:02 PM, sps
  Initial revision.
- v1.01, 11/26/2003 10:23 AM, sps
  20032 updates.
- v1.02, 3/1/05 11:59 AM, sps
  20043 updates.
- v1.03, 11/28/05 2:36 PM, sps
  20052 updates.