

# *Computer Graphics I (4003-570-02 / 4005-761-02)*

## Course Information

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**Phone:** (585) 475-6181

**Office hours:** Monday, Wednesday, 1:00PM – 2:00PM, Room 70-3517  
Friday, 10:00AM – NOON, Room 70-3517

**Class times:** Monday, Wednesday, 4:00 PM - 5:50 PM, Room 70-1455

**Course URL:** [http://www.cs.rit.edu/~rjb/CG1\\_20081.htm](http://www.cs.rit.edu/~rjb/CG1_20081.htm)

## Description

Computer Graphics I is a study of the hardware and software principles of interactive raster graphics. Topics include an introduction to the basic concepts, 2D and 3D modeling and transformations, viewing transformations, projections, rendering techniques, graphical software packages and graphics systems. Students will use computer graphics packages and implement fundamental computer graphics algorithms.

## Course Goals

- Students will have an appreciation of the history and evolution of computer graphics, both hardware and software.
- Students will have an understanding of 2D graphics and algorithms including: line drawing, polygon filling, clipping, and transformations. They will be able to implement these.
- Students will understand the concepts of and techniques used in 3D computer graphics, including viewing transformations, hierarchical modeling, color, lighting and texture mapping. Students will be exposed to current computer graphics research areas.
- Students will be able to use a current graphics API (OpenGL).
- Students will be introduced to algorithms and techniques fundamental to 3D computer graphics and will understand the relationship between the 2D and 3D versions of such algorithms. Students will be able to reason about and apply these algorithms and techniques in new situations.
- Students will be able to read and analyze technical papers in the field.

## Prerequisite

Third Year Standing or permission of instructor

**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.

## Texts

### **Required:**

Donald Hearn and M. Pauline Baker, [Computer Graphics with OpenGL \(3rd Edition\)](#), Prentice-Hall, 2003, ISBN: 0130153907

### **Recommended:**

OpenGL Architecture Review Board, [OpenGL Programming Guide: The Official Guide to Learning OpenGL, Version 1.4, Fourth Edition](#), Addison-Wesely, 2003, ISBN: 0321173481

OpenGL Architecture Review Board, [OpenGL\(R\) Reference Manual : The Official Reference Document to OpenGL, Version 1.4 \(4th Edition\)](#), Addison-Wesley, 2004, ISBN: 032117383X

## Requirements and Grading

	Undergraduate	Graduate
Exams	45%	35%
Assignments	45%	40%
Homework	10%	10%
Grad Report		15%

### **Exams:**

Two exams are scheduled for this course:

- Midterm: two-hour exam.
- Final: two-hour exam during finals week. The final exam will not be comprehensive

Both exams will be weighted equally in the calculation of your final grade.

**Note to graduate students:** A deeper understanding of the material is expected of graduate students. Hence, the graduate and undergraduate versions of the exams may not be the same.

### **Homework:**

Homework will be announced in class and posted on the course website. Due dates will also be posted on the website. Generally, students will have 1 week to complete homework assignments.

### **Programming Assignments:**

There will be four programming projects this quarter. Project descriptions will be posted on the course website. Generally, students will have 2 weeks to complete programming assignments.

### **Grad Report (graduate students only):**

Each graduate student is expected to research a topic relative to computer graphics and prepare a 10-15 page report. Please see <http://www.cs.rit.edu/~rjb/RITcourses/20081/ComputerGraphics1/public/gradreport.pdf> for specific information.

## Policy on Late Submissions:

It is extremely important to continue to make progress as the course progresses. As such, late deliverables will not be allowed. If you foresee any problems with meeting a deadline, please see the instructor well in advance of the deadline to work out alternate arrangements.

## Tentative Schedule

The tentative schedule is available on the course website.

**Lecture Notes:** When slides are presented in class they will be posted on the mycourses website at: <https://mycourses.rit.edu/index.asp>

All **assignments, readings, and homework** will be posted on the course website. Special events such as homework and exam dates will also be posted. **Please stay informed by visiting the course website regularly throughout the quarter.**

Dropboxes will be available on the mycourses website for submission of homework, assignments, and the grad report.

## Academic Honesty

It is a shame that this must be stated at all, but there are always a few students who do not abide by the rules of proper academic conduct. For the record:

- You may discuss the homework the assignments freely with each other.
- However, this does **not** mean that someone else can *do* your work for you. Any work you submit must contain a significant intellectual contribution by you.
- The corollary is that you may not do someone else's work for them either. Both the supplier and recipient of the material are guilty of cheating and will be treated as such.
- Any help you receive from someone **must be acknowledged in the work submitted**. Please be specific (what exactly did you get help with). Failure to acknowledge the source of a significant idea or approach is considered plagiarism and not allowed.
- Helping someone **does not** mean giving them a copy of your code. **You will get a zero for submitting someone else's code as your own. You will get a zero for distributing your code to others.** Please do not risk it!

The complete policy of the Department of Computer Science regarding Academic Honesty is attached and can also be found at: [http://www.cs.rit.edu/deptInfo/DCS.honesty\\_policy.pdf](http://www.cs.rit.edu/deptInfo/DCS.honesty_policy.pdf). Please read and be aware of the consequences.

Additional information regarding cheating and classroom conduct can be found at the following links

- Code of conduct for use of Department of Computer Science facilities: <http://www.cs.rit.edu/deptInfo/codeOfConduct.html>
- RIT policy on general student conduct: <http://www.rit.edu/academicaffairs/Manual/sectionD/D18.html>

## **Important Links** (more will be posted on the website throughout the quarter)

- Official page for OpenGL: <http://www.opengl.org/>
- Official Page for GLUT: <http://www.opengl.org/resources/libraries/glut.html>
- Nate Robbins home page (GLUT for Windows / OpenGL tutorials): <http://www.xmission.com/~nate/opengl.html>
- GLUT for Mac OS X: <http://developer.apple.com/samplecode/glut/index.html>
- Using OpenGL with Visual Studio .NET2003 (courtesy of Jonathon Donaldson): <http://csf11.acs.uwosh.edu/cs371/visualstudio/>

**Links from previous offerings of this course** (please take some time to go through these links. Lots of good information, code samples, tutorials, and other resources are available.

- Warren Carither's list of links: <http://www.cs.rit.edu/~wrc/courses/cg1/common/links.shtml>
- Nan Schaller's list of links: <http://www.cs.rit.edu/~ncs/Courses/570.shtml#resources>