

CS133 Computational Geometry

Winter 2003

1 Course Information

Instructor: Dimitrios Gunopulos, dg@cs.ucr.edu
Lecture: TTh 5:10 - 6:30 pm OLHM 1212
Office Hours: TTh 3:00 - 5:00 pm, Surge 324
TA: Sharmila Subramanian, sharmi@cs.ucr.edu
Textbook: *Computational Geometry in C (Second Edition)*
by Joseph O'Rourke, Cambridge University Press 1998.

2 Course objective

The course provides an introduction to the design of geometry algorithms. It covers the basic computational geometry concepts and techniques that arise in practical areas such as graphics, robotics or engineering design. Topics covered include polygons and polytopes, convex hulls, and voronoi diagrams.

Prerequisites: COS 141, MATH 113.

3 Grading Method

Assignments 30%, Quizzes 30%, Final 40%

4 Course organization

- *Quizzes*: There will be four or five quizzes. The lowest grade will be dropped.
- *Programming Assignments*: You will have three assignments.

The assignments will include theoretical problems as well implementation problems.

Good programming style is important.

Programs must compile without warnings.

Programs that do not compile will be given zero credit.

Partial credit will be given (but make sure to comment out portions that do not compile).

All assignments **MUST INCLUDE** the following at the top of the first page:

- I certify that this submission represents my own original work. (name, date)

All programming assignments **MUST INCLUDE** extensive documentation and a detailed explanation of the program, including asymptotic running time analysis of the implemented algorithm. There will be **NO** grade without complete documentation.

If you have a problem with the grading of an assignment bring your assignment at the latest one week after the assignment has been returned to you.

- *Lectures:* You should read and study the material before class. This should make the course much easier for you.

Questions during lectures are strongly encouraged.

You are responsible for knowing the material from both the lectures and the book.

- *Academic dishonesty:* Be forewarned that any cheating (copying programming assignments or homework, allowing programming assignments or homework to be copied, exam cheating, etc) will be punished to the fullest possible extent.

You are required to read the two handouts on cheating. The one entitled, **Additional Notes on Academic Dishonesty**, must be signed and returned to me.

5 Course Contents

1. Introduction
2. Polygon Triangulation
3. Convex Hulls in Two Dimensions
4. Convex Hulls in Three Dimensions
5. Voronoi Diagrams
6. Arrangements
7. Search and Intersection