

# AMS345/CSE355: Computational Geometry, Spring 2008

**Instructor:** Joe Mitchell, Math Tower 1-109, 632-8366, [jsbm@ams.sunysb.edu](mailto:jsbm@ams.sunysb.edu);

Office hours: Tentatively: Mon (12:00-1:00), Tue (12:30-2:00), or by appointment, or whenever you drop by and I am free (don't be shy!)

**Course Web Site:** <http://www.ams.sunysb.edu/~jsbm/courses/345/ams345.html>

**Teaching Assistant:** Roman Kogan ([romwell132@yahoo.com](mailto:romwell132@yahoo.com)); Office Hours in Harriman 010: Tues 3:00-5:00 or email for appointment.

**Lectures:** Mon/Wed 3:50-5:10 in Physics P-116.

**Text:** The main text is the book, *Computational Geometry in C*, Second Edition, by Joe O'Rourke. Another book (on reserve in the library) that may be useful is *Computational Geometry: Algorithms and Applications*, by de Berg, van Kreveld, Overmars, and Schwarzkopf.

**Prerequisites:** I will try to keep the prerequisites to a minimum and will review material as needed. You will find basic concepts of combinatorics (counting, graphs, recursion) to be very useful; AMS 301 or similar is good background. Knowledge of the design and analysis of algorithms is also very useful. Finally, it is useful to have some experience with C, C++, or Java. (You should at least be able to look a simple C program and understand it.) Some of the homeworks will ask you to write some small portions of code; there may be options, too, for students with more experience and interest in programming to do more.

**Homeworks:** There will be approximately 8 (equally-weighted) homework sets due throughout the course. They will usually be due on Wednesdays (at the beginning of class). I will drop the lowest score before computing your average.

**Homework Policy:** **No late homework will be accepted.** You may discuss homework problems with other students taking the course and with the instructor; however, the work that you turn in should always be *your own* write-up, and you should show that you personally understand everything that you write. **Please make certain that your writing is neat and clear, and that you have expressed your reasoning.** Please staple your pages!

**Exams:** There will be two equally-weighted exams: a midterm (tentatively given on March 26) and a (noncumulative) final (given during the first half of the assigned final exam period (Wed, May 14, 5pm-7:30pm). During the second half of the final exam period, you will have the option to take a "second chance" midterm exam; I will keep the higher of the two grades between the original midterm and the second-chance exam.

**Grades:** Your total average score will be based on 40% for each exam and 20% homework (after dropping lowest score). I will use your total average score to assign a letter grade; there is no pre-established scale or curve.

## Tentative Course Topics:

- Polygons, triangulation, visibility, art gallery problems
- Convex hulls
- Voronoi diagrams, Delaunay diagrams, proximity problems
- Point location search
- Arrangements of lines, hyperplanes; geometric duality
- Visibility graphs, shortest paths, motion planning
- Intersection problems

**Disability Policy:** If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information, go to the following web site: <http://studentaffairs.stonybrook.edu/disabilityservices/>.

**Academic Integrity Policy:** Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at the following url:

<http://www.stonybrook.edu/uaa/academicjudiciary/>.

**University Policy:** The University at Stony Brook expects students to maintain standards of personal integrity that are in harmony with the educational goals of the institution; to observe national, state, and local laws and University regulations; and to respect the rights, privileges, and property of other people. Faculty is required to report disruptive behavior that interrupts faculty's ability to teach, the safety of the learning environment, and/or students ability to learn to Judicial Affairs.