

TIME TABLE: 39523/39524 MWF 2:00PM – 2:50AM in Taft Hall 219.

CREDIT HOURS: 3 undergraduate hours. 4 graduate hours.

COURSE DESCRIPTION: Computational Geometry is devoted to the study of algorithms to solve geometrical problems. The development of the field is driven by applications to computer graphics, computer aided design, motion planning and visibility problems in robotics, geographic information systems, integrated circuit design, etc...

COURSE GOALS AND LEARNING OBJECTIVES: The goals of MCS 481 are

- (1) understand the statements and properties of geometric problems;
- (2) know algorithmic techniques to solve geometric problems; and
- (3) apply software to explore geometric algorithms.

PREREQUISITES: Grade of C or better in MCS 401; or consent of the instructor.

INSTRUCTOR: Jan Verschelde, Office: 1210 SEO.

Email: janv@uic.edu. URL: <http://www.math.uic.edu/~jan>.

OFFICE HOURS: At 1PM on Monday, Wednesdays, Fridays, in office or by appointment; via zoom <https://uic.zoom.us/my/profjanofficehour>.

MCS 481 SITE: See www.math.uic.edu/~jan/mcs481.html for notes, project descriptions, etc.

Backup site: <https://janv.people.uic.edu/mcs481>.

TEXTBOOK: *Computational Geometry. Algorithms and Applications* by M. de Berg, M. van Kreveld, M. Overmars, and O. Schwartzkopf. Springer-Verlag.

HOMEWORK: with every lecture three exercises are suggested. It is recommended that you try to solve these suggested exercises. Solutions to selected problems will be collected. Homework counts for 100 of the total 700 points.

CGAL is free and open source software, available at www.cgal.org. We will also use Python and the Jupyter notebook.

PROJECTS: Three projects will be assigned during the semester, worth a total of 200 points. Students may opt out of the exams and work on a computer project of their own research interest.

ACADEMIC HONESTY: No student shall claim or submit the work of another as ones own. You may discuss homework and projects with others, but must finish it and write the solution yourself without looking at others' work. Allowing someone to copy from you is also punishable.

All homework, projects, and exams in this class will be individual.

Verbatim copying the output of generative AI tools is plagiarism.

EXAMS: During the semester, there will be two exams worth 100 points each. There will be no makeup exams given. The final exam counts for 200 points. If an exam is missed, then greater weight will be placed on the final exam, especially on the material covered on the missing exam. Students may replace the final exam with a research computer project combined with a written technical report.

GRADING SCALE: 90 – 100% = A, 80 – 89% = B, 70 – 79% = C, 60 – 69% = D, 0 – 59% = E.

Your course grade is based on a total of 700 points: 100 from the homework, 200 from the projects, 200 from the exams during the semester, and 200 from the final exam.

POLICY FOR MISSED OR LATE WORK: Deadlines may be postponed. If you know you will be late, then it is better to apply for an extension of the deadline, instead of not submitting anything. For missed assignments, greater weight may be placed on the final project and/or final exam.

STUDENTS WITH DISABILITIES: UIC is committed to full inclusion and participation of people with disabilities in all aspects of university life. Students who face or anticipate disability-related barriers while at UIC should connect with the Disability Resource Center (DRC) at drc.uic.edu, drc@uic.edu, or at (312) 413-2183 to create a plan for reasonable accommodations. In order to receive accommodations, students must disclose disability to the DRC, complete an interactive registration process with the DRC, and provide their course instructor with a Letter of Accommodation (LOA). Course instructors in receipt of an LOA will work with the student and the DRC to implement approved accommodations.

CLASS ATTENDANCE: Students are expected to attend all class meetings. Any changes in this syllabus or in the scheduling of exams and other assignments will be announced during class meetings. We will also address the topics you need to implement the projects.

CLASSROOM CONDUCT POLICY: Be prepared to show your UIC i-card if requested. Respect others in the class. No cellphone usage is permitted. No food and no drinks are allowed. Students who engage in any behavior that results in the disruption of a class may be directed to leave the class room for the remainder of the class period.

SOME IMPORTANT DATES:

Monday 20 January : Martin Luther King Day. No classes.

Friday 24 January : Last day to register, last day to withdraw without W grade.

Friday 21 March : Last day for optional late drop for undergraduate students.

Monday 24 – Friday 28 March : Spring vacation. No classes.

Final exam : Wednesday 7 May 2025, 1:00PM-3:00PM, Taft Hall 219.

LAST REVISED: Monday 31 March 2025.