Course Syllabus – Spring 2022

Course
CS 6319.001
Course Title
Computational Geometry
Professor
Kyle Fox
Term
Spring 2022
Meetings
11:30am–12:45pm, Tuesdays and Thursdays in SCI 3.220

Professor’s Contact Information
Office Phone
(972) 883-4168
Office Location
ECSS 4.224 (meetings over MS Teams unless other arrangements made in advance)
Email Address
kyle.fox@utdallas.edu
Office Hours
Tuesdays 2:30pm–3:30pm and Wednesdays 10:00am–11:00am via MS Teams (tentative)
Other Information
Please email Kyle directly for additional help or to request additional office hours.

General Course Information
Pre-requisites
CS 5343
Course Description
This course will cover basic computational geometry topics, such as computing convex hulls, computing Voronoi diagrams and Delaunay triangulations, motion planning, and the main methods for developing geometric algorithms. We will also discuss various geometric data structures for point location and range searching and additional topics at the discretion of the instructor, such as geometric approximation and high dimensional data analysis.

Learning Outcomes
• Knowledge of basic geometric data structures such as Voronoi diagrams, quad trees, and range trees.
• Knowledge of basic geometric algorithms, including line sweep, point location, and convex hull.
• Knowledge of useful techniques and geometric structures, including duality, arrangements, and Delaunay triangulation.
• Ability to design and implement a geometric algorithm.
• Ability to apply computational geometry techniques to real world problems.

Required Texts & Materials

Suggested Texts, Readings, & Materials
The instructor will provide their own lecture notes on the course website
https://personal.utdallas.edu/~kyle.fox/courses/cs6319.001.22s/.
Assignments & Academic Calendar
Homework will be assigned every couple weeks. There will be four or five homework assignments released. Students will also participate in some sort of project involving a short survey, implementation, or research. Students will propose their project midway through the semester via a two page paper. They will then submit a longer paper on their results at the end of the semester.

Course Policies

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<th>Classroom Conduct Requirements Related to Public Health Measures</th>
<th>UT Dallas will follow the public health and safety guidelines put forth by the Centers for Disease Control and Prevention (CDC), the Texas Department of State Health Services (DSHS), and local public health agencies that are in effect at that time during the Spring 2022 semester.</th>
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<tr>
<td>Class Attendance</td>
<td>Regular class attendance is expected, and students who fail to attend class regularly are inviting scholastic difficulty. Your attendance helps Kyle to gauge how well the lecture is going, and it gives you an opportunity to ask questions as the lecture is being delivered. However, we understand you may not be able to attend all classes for any number of reasons. Kyle will broadcast each lecture live over MS Teams and later upload a video of the lecture to be made available via MS Teams. If you are unable to attend class in person or simply want to review lectures you’ve attended, please watch these videos. <strong>You do not need to ask permission or offer an explanation for missing class.</strong></td>
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| Class Recordings | Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

Kyle intends to record meetings of this course. These recordings will be made available to all students registered for the course. If Kyle or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law. |
| Grading (credit) Criteria | Four or five homework assignments will be released during the semester. Students will also submit a project proposal and a final project report. Each homework problem will be given equal weight (later assignments may have fewer problems to allow for more time for the project). Grades are determined with a weighted sum of homework worth 50%, the project proposal worth 10%, and the final project report worth 40%.

Pairs of students may work together and turn in homework, the project proposal, and/or the final project report as a single submission. Individual submissions are fine as well. All assignments should be turned in via eLearning. eLearning is not well designed for group submission, so each |
group should have exactly one of its members turn in the assignment. The grade for one submission will be given to all group members.

It is expected that students be able to solve homework problems using only course material and the work within their homework group. If necessary though, students are permitted to use any outside source or person as long as they cite the source and rewrite the solution in their own words. A full citation of an article or website should describe the specific work or webpage used. Students may also work with others outside their group, but again, they must cite all collaboration with other students in the class outside their group. Properly cited and rewritten outside material is still worth full credit. Material not cited or not rewritten in students’ own words will be considered an act of academic dishonesty and suspected incidents will be reported to the Office of Community Standards and Conduct. Students do not need to cite anything from this course or prerequisite courses, but when in doubt, they should cite anyway just to be safe.

Final grades are determined by each student’s performance relative to the class average. However, there is no fixed curve. If everybody performs well, then everybody can get top grades. Please talk to Kyle about grades before considering dropping the course.

Requests for a regrade must be made within one week of the homework assignment or exam being returned. The problem in question will be completely regraded, so the score may go down.

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<th>Extra Credit</th>
<th>While not guaranteed, there may be a small amount of extra credit available through additional homework questions. Outside sources cannot be used for extra credit questions. The existence of extra credit points will not affect the percentage cutoffs for students’ final grades.</th>
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<td>Late Work</td>
<td>Students must request extensions via email for any late work they plan to submit. Extensions of up to 24 hours for all assignments will be automatically approved, but the student must still make an explicit request. Longer extensions may be approved at the instructor’s discretion based on the circumstances involved.</td>
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| Comet Creed  | This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:  
As a Comet, I pledge honesty, integrity, and service in all that I do.” |
| Academic Support Resources | The information contained in the following link lists the University’s academic support resources for all students.  
Please go to [http://go.utdallas.edu/academic-support-resources](http://go.utdallas.edu/academic-support-resources). |
| UT Dallas Syllabus Policies and Procedures | The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus. Please review the sections regarding the credit/no credit grading option and withdrawal from class.  
Please go to [http://go.utdallas.edu/syllabus-policies](http://go.utdallas.edu/syllabus-policies) for these policies. |
The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.