

Course Syllabus – Fall 2022

Course Information

<i>Course Number/Section</i>	CS 4361.001
<i>Course Title</i>	Computer Graphics
<i>Term</i>	Fall 2022
<i>Days & Times</i>	TR 11.30am – 12.45pm
<i>Location</i>	ECSS 2.306

Professor Contact Information

<i>Instructor</i>	Dr. Pushpa Kumar
<i>Email Address</i>	pkumar@utdallas.edu
<i>Office Location</i>	ECSS 4.407
<i>Office Hours</i>	Wed 11am – 1pm or by appt. on Teams

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: MATH 2418, CE/CS/TE 2336, CE/CS/SE 3345 or equivalent

Course Description

CS 4361 Computer Graphics (3 semester credit hours) Review of graphic display architecture and graphic input devices. Two- and three-dimensional transformations, matrix formulations, and concatenation. Clipping and windowing. Data structures for graphics systems, segmented display files, rings, etc. Hidden line and surface elimination. Shading. Graphics packages and applications.

Student Learning Objectives/Outcomes

- Ability to understand the goal and applications of computer graphics
- Ability to understand and apply coordinate systems and their transformations
- Ability to understand basic 2-D drawing primitives and their implementations
- Ability to understand and apply 3-D viewing and perspective transformations
- Ability to understand hidden-line elimination problems and implement solutions

- Ability to understand hidden-face elimination problems and implement solutions
- Ability to understand the concepts of fractals and their applications
- Ability to develop user-interfaces with interactive drawing

Required Textbooks and Materials

Text: Leen Ammeraal and Kang Zhang, *Computer Graphics for Java Programmers*, 3rd Edition, John-Wiley & Sons, 2017.

References: F.S. Hill, Jr, *Computer Graphics Using Open GL*, Third Edition, Prentice-Hall, 2006.
 John F. Hughes, et al. *Computer Graphics: Principles and Practice*, Third Edition, Addison-Wesley Professional, 2014.
 J.D. Foley, et al. *Introduction to Computer Graphics*, Addison-Wesley, 1994.

Grading Policy

Grades will be determined by assignments, class participation, group project, and two exams. A student must perform satisfactorily in the assignments, project, class participation, and exams in order to pass the course. Their weightings are as follows:

Assignments:	20%
Class Participation:	5%
Term Project	25%
Exam 1:	25%
Exam 2:	25%

Letter Grade Scale

98–100=A+,	92-97=A,	90-91=A-,
88-89=B+,	82-87=B,	80-81=B-,
78-79=C+,	72-77=C,	70-71=C-,
68-69=D+,	62-67=D,	60-61=D-, 0-59=F

Assignments & Academic Calendar

Chapters 1 – 8 will be covered from the textbook. Lectures will be posted on eLearning. Reading assignments should be completed before the class lecture.

Topics will cover: Graphics rendering pipeline, Rasterization, Mathematical basics for applied geometry, Transformations, Clipping, 3D viewing, Hidden Line Elimination, Hidden Surface Elimination, Fractals, and Color Theory.

Project: A team programming project will be assigned. Details will be announced in class.

Course Schedule

<i>Dates</i>	<i>Topic</i>	
08/22/22 - 08/28/22	Introduction, Graphics Rendering Pipeline	Ch 1
08/29/22 - 09/04/22	Co-ordinate systems, Mapping modes	Ch 1
09/05/22 - 09/11/22	Line Drawing, Circle Drawing,	Ch 4
09/12/22 - 09/18/22	Applied Geometry, 2D, 3D Geometrical Transformations	Ch 2, 3
09/19/22 - 09/25/22	Line and Polygon Clipping Algorithms	Ch 4
09/26/22 - 10/02/22	Exam 1 Review, Exam 1	
10/03/22 - 10/09/22	Projections and Transformations	Ch 5
10/10/22 - 10/16/22	Hidden Line Detection Algorithms	Ch 6
10/17/22 - 10/23/22	Hidden Surface Detection Algorithms	Ch 6
10/24/22 - 10/30/22	3-D Object file formats, Fractals	Ch 5, 8
10/31/22 - 11/06/22	Fractals, Mandelbrot and Julia Sets	Ch 8
11/07/22 - 11/13/22	Color Theory and Shading Models, Exam 2 Review	Ch 7
11/14/22 - 11/20/22	Exam 2, Project Presentations	
11/21/22 - 11/27/22	Thanksgiving Break, No class	
11/28/22 - 12/04/22	Project Presentations	
12/05/22 - 12/08/22	Project Presentations (12/08 is last day of semester)	

Course & Instructor Policies

Good classroom citizenship is expected. Disruptive behavior in the classroom will not be tolerated. Please silence your cell phones during class.

Students are expected to attend all class lectures. If absent, students are responsible for any material covered in class.

Please complete and submit the pre-requisite survey form (under Assignments tab) required by the department before starting any homeworks.

There is a 10% reduction in grade per day for any late submissions under normal circumstances; no late submissions accepted more than four days after original due date.

Students have one week after the results of an assignment or test is returned to request a review/correction of their grade. No extra credit allowed.

Exams 1 & 2 will be held at the UTD testing center. Students must reserve an exam seat online through RegisterBlast tool

<https://www.registerblast.com/utdallas/> no later than 72 hours prior to the exam time. There are no walk-in appointments allowed, so please plan ahead and reserve your seat early and in advance.

Please include course name and number "CS 4361.001" in the subject line for any email communication.

Exceptional cases, such as illness and accidents, will be handled on an individual basis (Instructor must be notified prior and proof presented – otherwise a score of zero will be given).

You will each be responsible for your own actions, which include following along in class, completing all assignments, and working with your team on the project.

The details of this Syllabus are subject to change at any time during the course, it is the responsibility of the student to check for updates.

In case of eLearning difficulties, please contact 24/7 eLearning help desk at URL: <https://ets.utdallas.edu/elearning/helpdesk> or Phone: 1 866 588 3192

Class Materials

The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in 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](#).

Class Attendance

The University's attendance policy requirement is that individual faculty set their course attendance requirements. Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. In some courses, instructors may have special attendance requirements; these should be made known to students during the first week of classes.

Class Participation

Regular class participation is expected. Students who fail to participate in class regularly are inviting scholastic difficulty. A portion of the grade for this course is directly tied to your participation in this class. It also includes engaging in group or other activities during class that solicit your feedback on homework assignments, readings, or materials covered in the lectures (and/or labs). Class participation is documented by faculty. Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements is a violation of the [Student Code of Conduct](#).

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](#).

NOTE: if the instructor records any part of the course, then the instructor will need to add the following syllabus statement:

The instructor may record meetings of this course. These recordings will be made available to all students registered for this class if the intent is to supplement the classroom experience. If the instructor 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.

Off-campus Instruction and Course Activities

(Below is a description of any travel and/or risk-related activity associated with this course.)

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 see <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 catalog sections regarding the [credit/no credit](#) or [pass/fail](#) grading option and withdrawal from class.

Please go to <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.