



Department of Computer Science

CS 4722 – Computer Graphics and Multimedia Course Syllabus

Instructor:	Dr. Alan Shaw Email: ashaw8@kennesaw.edu [Use D2L Email] Phone: 470-578-4479 Virtual Office hours: 2:30pm - 2:00pm, TR (Online) <i>Other hours will be by appointment</i>
Course Room:	Meeting Times: TR 5:00 PM - 6:15 PM Location: J-251
Course Description:	The basic principles and practices of interactive computer graphics and multimedia systems are covered in this introductory course. The design and implementation of state-of-the-art computer graphic rendering and visual multimedia systems are the main part of the course. The sub-topics of the course deal with specific input/output hardware devices and their technology, software and hardware standards, programming methods for implementing 3-dimensional graphical applications and interactive multimedia applications, and a study and evaluation of the effectiveness of graphic/multimedia communications. A large component of the class is the building of a large-scale application.
Class Design:	The course will be delivered as lectures and with supporting exams and assignments. All lecture notes will be provided via KSU D2L Brightspace (http://d2l.kennesaw.edu/). The variety of online tools draws on individual learning styles and helps students become more versatile learners.
Textbook and Resources:	None [ALG No Textbook Course - Affordable Learning Georgia] Supplemental resources: Software This course revolves around writing, compiling, and running programs. The needed software is available for students to download as described in the "Course Technology Requirements" Content Link on D2L. At this link you will be provided with software to install onto your own computer if you do not already have it.

Prerequisites:	CS 3305
Course Learning Outcomes:	<p>After successful completion of this course, a student should be able to:</p> <ul style="list-style-type: none"> • Demonstrate an understanding of how graphical information is represented to a graphics system and encoded by the system to create images • Organize graphical information in a program in order to create images with a graphics API • Use events in a graphics system to create interactive graphics displays • Use a modern graphics API (such as OpenGL, DirectX, or WebGL) to create effective 3D images • Construct programs and demonstrate proficiency using shaders written in languages such as HLSL, Cg, or GLSL. <p>SPECIAL NOTICE: This course will make use of a laboratory work and homework exercises. In order to participate in any of the course labs or other assignments (required to earn a passing grade in this course), each student is advised to locate and read KSU's Information Technology Computer Usage Policies (which can be found at https://policy.kennesaw.edu/policy/information-technology).</p>
Table of Contents:	<p>Module 1 - Introduction Slides: Course Overview Intro to Computer Graphics with WebGL</p> <p>Module 2 - Graphics Programming Slides: WebGL and JavaScript From OpenGL to WebGL Using Shaders</p> <p>Module 3 - Interactions and Animation Slides: Animation and Rotation Cube Rotation Position and Input</p> <p>Module 4 - Geometric Objects and Transformations Slides: Geometry and Matrix Transformations Matrix Math</p> <p>Module 5 - Viewing and Projections Slides: Classical Types of Viewing Projections Camera View Projections Orthographic and Perspective Projections</p> <p>Module 6 - Lighting, Shading and Texture Mapping</p>

	<p>Slides: Lighting Lighting and Shading Texture Mapping</p> <p>Module 7 - Modeling and Hierarchy: Building Scenes Slides: Matrix Stacks Skyboxes</p> <p>Module 8 - Modeling and Hierarchy: Building Scenes Slides: Matrix Stacks Scene Graphs</p>
Turnaround Time on Assignments:	All in-class and online assignments and assessments will be graded and posted within a week after the due dates.
Response Time to Emails and Voicemails:	I will respond to all emails and voicemails within 24 hours on weekdays and 48 hours on weekends. Please email me via D2L (http://d2l.kennesaw.edu/).
Tracking Learning Progress:	Students have continuous opportunities to track their learning progress via the Gradebook Tool provided inside of D2L (http://d2l.kennesaw.edu/).

POLICIES

Attendance:

The instructor expects your attendance on D2L daily, or at a minimum of 2-3 times per week. Grade performance is a demonstrated function of participation in online activities. Students in this class should realize the nature of the course in which they are enrolled. This is an online class with no on-campus meetings scheduled. Therefore, there are no planned face-to-face interactions between students or between students and the instructor. Students are encouraged to visit the instructor on campus during office hours, but this is not required. Students will interact with each other and with the instructor virtually, through online discussions in D2L, email, chat sessions and instructor feedback.

It is easy to fall behind in any course, but especially in an online course where it is up to the student to formalize a time to work on course materials. In order to ensure a student does not fall behind it is **STRONGLY** encouraged that students keep to the schedule suggested in this syllabus [basically one course module per 2 weeks during Fall and Spring semesters, one course module per 1 week during a 7 week Summer Semester, and two per week during a 4 week Summer Semester]. There is an activity and assignment due for every module. This is a way to keep the student focused and for the instructor to assess student progress. Students must make a concerted effort to

maintain currency and not wait until the last minute to complete assignments. The course is designed to enhance student learning, but the student is ultimately responsible to ensure that the learning takes place.

Evaluation criteria explained:

- Students are expected to be active participants in each class meeting. Full credit for participation will be extended to students who regularly ask questions, share observations, and contribute relevant personal experiences.
- Examinations will consist of program assignments and technological comprehension that cover the lecture material, and assigned readings.
- Students will be given specific guidance on the amount of collaboration permitted for each assignment.

Exams:

There will be quizzes in each Module and two (2) primary examinations (cumulative Midterm & Final Exam). The content will come from the text and other material presented in the readings and lectures, as well as in the homework assignments.

There will be no make-up examinations. It is the student's responsibility to arrange for an excused absence before the exam. A grade of zero will be assigned for all exams missed without an excused absence. If an emergency arises on the day of a midterm, and the instructor deems that the absence is excused, then the weight of the final exam may be increased to replace the midterm.

Assignments:

Assignments are due throughout the term. Each of these assignments is weighted as noted in the assessment section below.

You lose 20% of your score if you turn in a homework assignment late, and late assignments will only be accepted up to one week after the due date!

Assignments must be submitted through D2L by 11:59pm on the designated due date for each assignment.

Student Course Evaluation:

A standard questionnaire will be administered during the last two weeks of the semester in all courses. Additional questions developed by the college or instructor(s) may be included as well. It is important that each student provide meaningful feedback to the instructor(s) so that changes can be made in the course to continually improve its effectiveness. We value student feedback about the course, our teaching styles, and course materials, so as to improve our teaching and your learning. At a minimum, the following two questions will be asked:

1. Identify the aspects of the course that most contributed to your learning (include examples of specific materials, exercises and/or the faculty member's approach to teaching and mentoring), and
2. Identify the aspects of the course, if any, that might be improved (include examples of specific materials, exercises and/or the faculty member's approach to teaching and mentoring).

Assessment: The Distribution of Graded Material is as follows:

Quizzes (20pts per Module, 8 Modules)	160
Assignments/Projects (50pts per Module, 8 Modules)	400
Test #1 - Midterm Exam (<i>Comprehensive</i>)	200
Test #2 - Final Exam (<i>Comprehensive</i>)	240
Total	1000

Grading Scale:

Grade	Percentage	Point System
A	90% - 100%	900 - 1000
B	80% - 89%	800 - 899
C	70% - 79%	700 - 799
D	60% - 69%	600 - 699
F	59% or below	0 - 599

Acquiring Final Grades:

In an effort to better utilize our technology resources, Kennesaw State University has instituted the reporting of end of term grades by phone. This is in addition to the web version of grades, which has been in effect for several terms. All current semester term students may call 770-420-4315 and select Option Number 4 to secure their end of term grades. With this new development, printed grade reports will not be mailed at the end of the term. Students needing verification of grades or enrollment should request either an official transcript or an enrollment verification through the Office of the Registrar.

Withdrawal Policy:

The last day to withdraw without academic penalty is [shown on the Registrar's Semester Calendar](#). Ceasing to participate in the class or oral notice thereof DOES NOT constitute official withdrawal from the course. Students who simply stop attending classes without officially withdrawing usually are assigned failing grades. Students wishing to withdraw after the scheduled change period (add/drop) must obtain and complete a withdrawal form from the Academic Services Department in the Registrar's Office.

Incomplete Policy:

The grade of "I" denotes an incomplete grade for the course, and will be awarded only when the student has done satisfactory work up to the last two weeks of the semester, but for nonacademic reasons beyond his/her control is unable to meet the full requirements of the course. A grade of "I" must be removed (by completing the course requirements) within one calendar year from the end of the semester in which the "I" was originally assigned.

Enrollment Policy:

Only those students who are enrolled in the online course may visit the lectures, receive assignments, take quizzes and exams, and receive a grade for the course via D2L. If a student is administratively withdrawn from this course, they will not be permitted to participate in any online course activities nor will they receive any grade for the course.

Email Messages:

Remember to put the course name and section number in the subject field of every email message that you send me. Email messages that are missing this information are likely to be automatically redirected to a folder I seldom check.

Diversity Statement:

All courses offered by the Computer Science department will adhere to the KSU policy that prohibits discrimination on the basis of race, religion, color, sex, age, disability, national origin or sexual orientation.

Disability Statement:

Any student with a documented disability needing academic adjustments is requested to notify the instructor as early in the semester as possible, and must do so before the mid-term exam. Verification from KSU disabled Student Support Services is required. All discussions will remain confidential. http://www.kennesaw.edu/stu_dev/dsss/dsss.html

CS Department Policies:

Students are minded that the CS Department has certain policies in place that govern practices within the department. Including:

- All courses used toward any undergraduate degree in the CS Department must be completed with an assessed performance grade of "C" or better. This means that all prerequisite courses from the CS Department must have been completed with a "C" or better in order for a student to enter the next course in a sequence.
- All requests for course overloads must be made through the department chair's office. The Instructor of any course is not permitted to authorize course overloads.
- All requests for prerequisite bypasses must be made through the department chair's office. The Instructor of any course is not permitted to authorize course overloads.

Students who are not recorded under their intended major may find that they may be limited from registering for courses they require to complete their intended program of study.

To answer any questions about these or other departmental policies, please contact the chair's office.

Academic Integrity Statement:

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the University's policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an "informal" resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct's minimum one semester suspension requirement.

Students are encouraged to study together and to work together on class assignments and lab exercises; however, the provisions of the STUDENT CONDUCT REGULATIONS, II. Academic Honesty, KSC Undergraduate Catalog will be strictly enforced in this class.

Frequently students will be provided with "take-home" exams or exercises. It is the student's responsibility to ensure they fully understand to what extent they may collaborate or discuss content with other students. No exam work may be performed with the assistance of others or outside material unless specifically instructed as permissible. If an exam or assignment is designated "no outside assistance" this includes, but is not limited to, peers, books, publications, the Internet and the WWW. If a student is instructed to provide citations for sources, proper use of citation support is expected. Additional information can be found at the following location.

<http://www.virtualsalt.com/antiplag.htm>

Acknowledgment and Acceptance of Academic Integrity Statement:

In any academic community, certain standards and ethical behavior are required to ensure the unhindered pursuit of knowledge and the free exchange of ideas. Academic honesty means that you respect the right of other individuals to express their views and opinions, and that you, as a student, not engage in plagiarism, cheating, illegal access, misuse or destruction of college property, or falsification of college records or academic work. As a member of the Kennesaw State University academic community you are expected to adhere to these ethical standards. You are expected to read, understand and follow the code of conduct as outlined in the KSU graduate and undergraduate catalogs. You need to be aware that if you are found guilty of violating these standards you will be subject to certain penalties as outlined in the college judiciary procedures.

These penalties include permanent expulsion from KSU. Students are required to complete the Academic Integrity Quiz in D2L Brightspace to acknowledge the receipt of this syllabus and to acknowledge that they agree to abide by the class policies and the academic integrity policies of the University.

Schedule:

Please see the link from the D2L Brightspace page for the course schedule. It will be updated online during the semester.

Tentative Course Schedule: Subject to change

Modules & Due Dates	Course Assignments
Module 1 Module Tasks Due Jan 25	Welcome Video/Overview - Login to D2L: http://d2l.kennesaw.edu/ Go to Course Learning Modules - Start Module 1 Lecture PowerPoints/Video Clips Introduction Assignment Exercises and Quiz <i>(Refer to Module 1 on D2L)</i>
Module 2 Module Tasks Due Feb 8	Lecture PowerPoints/Video Clips Graphics Programming Assignment Exercises and Quiz <i>(Refer to Module 2 on D2L)</i>
Module 3 Module Tasks Due Feb 22	Lecture PowerPoints/Video Clips Interactions and Animation Assignment Exercises and Quiz <i>(Refer to Module 3 on D2L)</i>
Module 4 Module Tasks Due Mar 7 Midterm Exam	Lecture PowerPoints/Video Clips Geometric Objects and Transformations Assignment Exercises and Quiz <i>(Refer to Module 4 on D2L)</i> Midterm Exam - Comprehensive (Modules 1-4)
Module 5 Module Tasks Due Mar 29	Lecture PowerPoints/Video Clips Viewing and Projections Assignment Exercises and Quiz <i>(Refer to Module 5 on D2L)</i>

Module 6 Module Tasks Due Apr 12	Lecture PowerPoints/Video Clips Lighting, Shading and Texture Mapping Assignment Exercises and Quiz <i>(Refer to Module 6 on D2L)</i>
Module 7 Module Tasks Due Apr 26	Lecture PowerPoints/Video Clips Modeling Hierarchy: Shadow Maps / Skyboxes Assignment Exercises and Quiz <i>(Refer to Module 7 on D2L)</i>
Module 8 Module Tasks Due May 3	Lecture PowerPoints/Video Clips Modeling Hierarchy: Building Scenes Assignment Exercises and Quiz <i>(Refer to Module 7 on D2L)</i>
Final Exam: May 7	Final Exam - Comprehensive (Modules 1-8)