



## Department of Computer Science & Engineering (CSE)

**CISC 4391 – Graphics Games Programming – TR 11:00 AM – 12:20 PM. DAV RM 122**

### **Contact Information:**

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UMHB MyCampus/Canvas ([mycampus.umhb.edu](http://mycampus.umhb.edu))

Office Hours: MW 08:00 AM – 09:00 AM, TH 1:00 – 5:00 PM  
Other times: By appointment

### Overview:

This course is designed to introduce students to various game engine and techniques while working with 2/3 dimensional graphics. That is in addition to algorithms, techniques, principles for design, use and understanding of graphical display.

### **Course Description:**

CISC 4391 01 – Special Topics: Graphical Games Programming (3 hrs.). *Important notice:* At least fifteen (15) contact hours, as well as a minimum of thirty (30) hours of student homework is required for each credit hour. Mode of delivery will consist of lectures and lab work. Prerequisite: CISC 3321 or equivalent. In this course, students work both independently, and in groups, to develop, either from the scratch or template, meaningful graphical games using the Java language. Students study various graphical game engines & techniques, i.e. real-time 2D/3D graphics, lighting, terrain and texture mapping, visibility and occlusion, collision detection and avoidance, character animation, and Artificial Intelligence characters. We will explore two-dimensional and three-dimensional renderings of mathematical and scientific data (such as fractals), as well as photo-realistic objects using C++.

### Course Objectives:

Topics covered in this course include the following:

- Simple Game Design
- Interactivity and User Interface
- Collections
- Sound Effect and Music
- Lists and Collision Detection
- 2D and 3D games
- Multi-Player Game
- 3D Objects and AI
- Attributes and use of output primitive

- Introduction to DirectX.
- Drawing objects.
- Pointing
- Viewing
- Color and Lighting.
- Special effects.

Upon completion of the course, the student will be able to:

- Develop a strong background in game theory and practice.
- Produce useful games using the Java Language.
- Incorporate artificial intelligence into their games.
- Detect and avoid (if necessary) collision.
- Add sounds and special effects into the game play.
- Learn the basic terminology, principles and methods of Computer Graphics.
- Develop skills in the use of Computer Graphics as a Computer Science tool.
- Gain confidence in solving a variety of Computer Graphics problems.
- Be introduced to windowing graphics and the OpenGL and DirectX graphical languages.

Course Goals:

- Achieve personal understanding and gain the ability to develop high moral character and principles in the world of business and science.
- Develop computer science skills necessary to pursue excellence and effectiveness within the field of computing.
- Have a proper balance between the theory and practice. This is because a strong theoretical foundation of the hardware and software aspects of computer science, as well as the practical application and knowledge of current practice is imperative.

Computer Science BA/BS Student Learning Outcomes: Note that student learning outcomes (SLOs) related to this course are highlighted in blue

- *Application of Knowledge:* An ability to apply fundamental principles of computing and mathematics as appropriate to the discipline of computer science
- *Problem-Solving Design:* An ability to analyze a problem and to utilize appropriate methodologies to identify and define the computing requirements appropriate to solve a computer science problem (C = Mastery)
- *Application of Skills and Knowledge:* An ability to design, implement, and evaluate a computer-based system, process, component or program to meet project design goals in order to satisfy a client's needs subject to constraints (C)
- *Data Analysis:* An ability to interpret graphical, numerical, and textual data to use current techniques, skills and tools necessary for computing practice (C)
- Teamwork: An ability to function effectively in teams to accomplish a common goal
- Communication: An ability to communicate effectively with a wide range of audience

- Responsibility: An understanding of ethical, professional, legal, security, and social responsibilities of computer scientists
- *Professional Development*: Recognition of the necessity for, and an ability to engage in, continuing professional development (C)
- *Diversity*: An ability to analyze the local and global impact of computing on individuals, organizations, and diverse cultures and traditions

### **Course Material/Textbooks/Other Information:**

Projects and programming assignments will be given weekly. Our computer lab will have the proper software installed for this course (NetBeans and FANG Engine) if you choose to use the lab or I will give you the necessary directives to complete the assignments in advance. Always have an external storage (flash drive, for example) to save and backup your work.

### Textbooks and Readings:

Textbook: Introductory Programming with Simple Games Using Java and the Freely Available Networked Gaming Engine (1<sup>st</sup> edition) by Ladd & Jenkins & Interactive Computer Graphics: A Top-down Approach with Shader-Based OpenGL (6<sup>th</sup> edition by Angel and Shreiner.

### **Academic Honesty:**

The UMHB policy (cited below for your convenience) on academic integrity applies in this course: "The University of Mary Hardin-Baylor expects the highest standards of academic integrity among all members of the campus community. All acts of plagiarism or violations of academic honesty are considered serious offenses and may result in failure of the assignment or the course."

### **Disabled Student Services and Accommodations**

"It is the student's responsibility to request disability accommodations. If you require an accommodation for a disability, contact the UMHB Counseling, Testing & Health Services (temporarily located at 201 W. 11<sup>th</sup> Avenue) as early as possible in the term. The Course Catalog, Student Handbook and UMHB website provide more details regarding the process by which accommodation requests will be reviewed."

Nate Williams, MA, LPC  
 Director of Counseling, Testing & Health Services  
 Accommodation & Student Assistance Program  
 Mabee Student Center, Suite 310  
 900 College Street  
 UMHB Station Box 8437  
 Belton, TX 76513-2599  
 Office: (254) 295-4696  
 Fax: (254) 295-4196  
 Email: [nwilliams@umhb.edu](mailto:nwilliams@umhb.edu)

### **Assignments and Grading:**

Grades will be calculated based on two tests, in-class quizzes and participation, programming assignments/projects and a final exam. Your final grade will be the sum of the percentages you earned in each category as shown below:

Quizzes/participation -----10%  
Tests (2) -----30%  
Projects/Programming assignments-----40%  
Final Project -----5%  
Final Exam -----15%

Grading scales:

A	91-100
B	81-89
C	71-79
D	61-69
F	Below 61

Projects/Programming Assignments:

All projects/programming assignments will be available on the class webpage or Mycampus.

- Point value will vary depending on the level of difficulty.
- All assignments/projects must be “submitted” *no later than the cutoff time* (cutoff time online or beginning of the class on the due date). Late assignments receive **NO** (zero) credit. Please be aware of the due date/time and submit ALL assignments in a timely manner.
- All submitted assignments should be “backed up” in both soft copy (electronic version) on your PC’s hard drive or other media such as a USB flash drive (*labeled with your name and class period*) and hard copy (printout). This backup will be requested in the event errors occur during the “submit” process.

Homework: relevant homework will be given periodically to help you prepare for programming assignments. This is in addition to all the programming assignments, which are also considered as homework. An out-of-class preparation and successful completion of these will determine how well you do in the course.

Quizzes:

Quizzes can be given on any day and at my discretion (usually when the attendance is very low – this is to encourage attendance) or be made available online during a given window and cannot be accessed once that window closes. No makeup on quizzes regardless of the circumstances.

### Tests and Final Exam:

Each test will cover lectures notes, assignments and other material up to that point. No cheating on tests and quizzes (see cheating below) will be tolerated. Final exam will be comprehensive but with emphasis on the new material. It is my expectation that you will comply with the UMHB Academic Honesty policy, as listed in the UMHB Undergraduate Bulletin.

Test and Quiz Makeup: I will give **NO** makeup tests. However, if you have a valid reason for missing a test (validity is determine by me) given before the test, I will replace the missed test with your final exam (i.e. your final exam will count both as a test and final exam). This is one time deal. So you cannot miss two tests and expect the same deal to hold for both. See quiz makeup policy above.

### **Student Decorum:**

Cheating: Don't do it! I will not tolerate neither cheating nor plagiarism. I am a very nice guy, but I have a very short temper when it comes to these. Copying assignments, submitting your friends or classmates' assignments as your own, wandering eyes on tests or quizzes are just a few examples. The consequences for these kinds of activities could be severe with lower limit being an "F" for the course and the upper limit being a referral to the Dean of students for a possible dismissal from UMHB.

Attendance: It is highly recommended. Remember that participation in the class discussion is important in grasping the material (you cannot participate if you are not here). If you miss more than 4 class meetings without a valid excuse, then I will hand down the necessary punishment (to be determined).

Mycampus for communication: We will extensively utilize this Learning Management System (LMS) known as mycampus (mycampus.umhb.edu) for a lot of class related activities, and especially for communication. So check your e-mail often (preferably twice a day).

Use of electronic device during class: Use of any electronic device (not sanctioned by me) is prohibited. Those who are caught doing this will be asked to leave the class. No discussion.

### **Tentative course schedule and important Dates:**

Drop Deadline: Friday September 19, 2014. After this date, you cannot drop this course with a "W". November 14 is the drop deadline for WP/WQ\*

Labor Day: Monday September 1, 2014 – classes do not meet

Thanksgiving Holidays: Wednesday November 26 – Friday November 28, 2014 – classes do not meet

Final Exam: Thursday December 11, 2014 (time: 10:30 AM– 12:30 PM)

### **Week of August 26**

Tuesday – Review Class Policy, Syllabus, etc. Reading assignment, ch1 & 2.

Thursday – lecture; assignment 1.

### **Week of September 2**

- Tuesday – lecture; assignment 1 revisited  
 Thursday – lecture; discuss assignment 1;
- Week of September 9**  
 Tuesday – lecture; assignment 1 due  
 Thursday – lecture; discuss assignment 2
- Week of September 16**  
 Tuesday – lecture; assignment 2 due; assignment 3, Reading assignment, ch3.  
 Thursday – lecture; discuss assignment 3
- Week of September 23**  
 Tuesday – lecture; assignment 3 due; assignment 4  
 Thursday – lecture; discuss assignment 4
- Week of September 30**  
 Tuesday – lecture; assignment 4 due; assignment 5, Reading assignment, ch4.  
 Thursday – lecture; discuss assignment 5
- Week of October 7**  
 Tuesday – lecture; assignment 5 due; assignment 6  
 Thursday – lecture; discuss assignment 6
- Week of October 14**  
 Tuesday – lecture; assignment 6 due; assignment 7, Reading assignment, ch5.  
 Thursday – lecture; discuss assignment 7
- Week of October 21**  
 Tuesday – lecture; assignment 7 due; assignment 8  
 Thursday – lecture; discuss assignment 8
- Week of October 28**  
 Tuesday – lecture; assignment 8 due; assignment 9, Reading assignment, ch6.  
 Thursday – lecture; discuss assignment 9
- Week of November 4**  
 Tuesday – lecture; assignment 9 due; assignment 10  
 Thursday – lecture; discuss assignment 10
- Week of November 11**  
 Tuesday – lecture; assignment 10 due; assignment 11, Reading assignment, TBA.  
 Thursday – lecture; discuss assignment 11
- Week of November 18**  
 Tuesday – lecture; assignment 11 due; assignment 12  
 Thursday – lecture; discuss assignment 12
- Week of November 25**  
 Tuesday – lecture; assignment 12 due, Reading assignment, TBA.  
 Thursday – no class
- Week of December 2**  
 Tuesday – lecture; no assignment  
 Thursday – Final exam review
- Week of December 9**  
 Final exams and Commencement

**Definition of a credit hour for this course:**

At least fifteen (15) contact hours, as well as a minimum of thirty (30) hours of student homework is required for each credit hour

Other definitions:

*Laboratory courses*, with little outside work, require a minimum of forty-five (45) contact hours. If moderate outside work is required, thirty (30) contact hours are required.

*Art courses* follow the recommendations for awarding credit as recommended by The National Association of Schools of Art and Design (NASAD) and the Texas Association of Schools of Art (TASA). In lecture courses, like art history, normally one hour of credit represents one 50-minute session each week of the term. For our studio classes, normally a ratio of one hour of credit = two hours of contact time and one hour of outside work per week, for example a 3-credit hour course would require six faculty contact hours per week. Note: Faculty contact must be sufficient to ensure the development of knowledge and skills required by each course. Normally, faculty contact is greater at the foundation or introductory level than at the advanced studio level.

*Music courses* follow the recommendations for awarding credit as required by The National Association of Schools of Music (NASM). Normally, a semester hour of credit represents at least three hours of work each week for a period of fifteen or sixteen weeks. In lecture classes, such as music history, normally one hour of credit is given for one 50-minute session plus two hours of homework each week of the term. For ensembles, like laboratory classes, normally one hour of credit is given for two to four 50-minute rehearsal sessions per week, this depends on the ensemble. For applied lessons, normally we give one hour of credit for each three hours of practice, plus the necessary individual 30-minute lesson per week with the instructor. For example, a two credit hour applied lesson would meet for two 30-minute lessons per week.

*Internships, clinical and field experiences* require a minimum of forty-five (45) clock hours for each credit hour.

*For online, hybrid and other nontraditional modes of delivery*, credit hours are assigned based on learning outcomes that are equivalent to those in a traditional course setting; forty-five (45) hours of work by a typical student for each hour of credit.

\*Note: the syllabus is subject to change