Course Title: **Computer Graphics and Visual Computing**
Course Prefix: **COMP**  Course No.: **3213**  Section No.: **P01**

**Department of**  **Computer Science**  |  **College of**  **Engineering**

**Instructor Name:** Yonggao Yang  
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**U.S. Postal Service Address:** Prairie View A&M University, P.O. Box 2515, Prairie View, TX 77446

**Office Hours:** Mondays, Tuesdays, and Thursdays: 9:00am - 11:00pm, and by appointment  
**Virtual Office Hours:** Email / Phone

**Course Location:** S.R. Collins, Room 210  
**Class Meeting Days & Times:** Tuesdays and Thursdays at 12:30 – 1:50

**Catalog Description:** (3-0) Credit 3 semester hours. Principles of interactive computer graphics; Topics include fundamental techniques in graphics, graphic systems, graphic communication, geometric modeling, rendering, computer animation, visualization and virtual reality and other recent developments in computer graphics. Prerequisites: COMP 2013 and COMP 2103.

**Prerequisites:** Prerequisites: COMP2013 Data Structures and COMP2103 Discrete Structures. Students must be proficient at programming in C/C++.

**Co-requisites:** None

**Required Text:** None

**Recommended Text/Readings:**  
Title: Interactive Computer Graphics: a top-down approach using OpenGL  
Author: Edward Angel  
Edition: 4th  
Publisher: Addison Wesley

**Access to Learning Resources:** PVAMU Library:  
phone: (936) 261-1500;  
web: [http://www.tamu.edu/pvamu/library/](http://www.tamu.edu/pvamu/library/)

University Bookstore:  
phone: (936) 261-1990;  
web: [https://www.bkstr.com/Home/10001-10734-1?demoKey=d](https://www.bkstr.com/Home/10001-10734-1?demoKey=d)

**Course Goals or Overview:**  
This course provides a basic introduction to the theory and practice of 3D computer graphics (using C/C++ and OpenGL, WebGL), animation, and game design and implementation (using game engine Vizard). The focus is on fundamental topics in computer graphics, 3D animation and simulation, multimedia, and etc.
Course Outcomes/Objectives

At the end of this course, the student will have

**Outcome c:** An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
  c1: ability to understand and define requirements of the problem
  c2: Ability to design and implement a program to solve the problem

**Outcome i:** An ability to use current techniques, skills, and tools necessary for computing practice

Course Requirements & Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

- **Exams** – written tests designed to measure knowledge of presented course material
- **Exercises** – written assignments designed to supplement and reinforce course material
- **Projects** – project assignments designed to measure ability to apply presented course material
- **Class Participation** – daily attendance and participation in class discussions

Grading Matrix

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming assignments</td>
<td>25</td>
</tr>
<tr>
<td>Midterm</td>
<td>35</td>
</tr>
<tr>
<td>Final Project &amp; presentation</td>
<td>35</td>
</tr>
<tr>
<td>Attendance</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Grade Determination:**
A = 100 – 90pts;
B = 89 – 80pts;
C = 79 – 70pts;
D = 69 – 60pts;
F = 59 or below

Course Procedures

**Submission of Assignments and Exam Policy**

- **Exams**: Make-up exams and quizzes will be given ONLY for university sanctioned excused absences.
- **Assignment**: Late assignments will not be accepted except *adequate documentation of an emergency is provided*. Always hand in whatever you have on the due date for partial credit.
- **Scholastic Dishonesty**: Academic honesty is expected from all students. *Academic dishonesty will not be tolerated and violations will be dealt with severely!* You may discuss assignments in general terms, but you are not allowed to share any details of actual algorithms or of program code. *All work submitted for a grade must be your own work.*

Professional Organizations and Journals

- [https://www.opengl.org/](https://www.opengl.org/)
- WorldViz: Vizard
- IEEE Computer Graphics & Applications
- ACM Transactions on Graphics
16 WEEK CALENDAR

The following is a rough outline of the topics the class will cover, and the related chapters in the textbook. Note, however, that the lectures will not follow the book completely; some lecture materials will not appear in the book, and some material in the book will not be covered in lecture. As a general principle, the student will be responsible for the topics covered in lectures, and for topics covered in the book which are specifically assigned by the instructor.

- Unit01: Syllabus, Demonstration, Setup Programming Environment, Testing Example
- Unit02: Introduction to Computer Graphics
- Unit03: Computer Graphics Systems
- Unit04: Graphics Primitives
- Unit05: 3D viewing
- Unit06: Geometric Transformation
- Unit07: Computer Animation (Handout)
- Unit08: Lighting and Shading
- Unit09: Fog and Blending
- Unit10: Texture Mapping (Optional)
- Unit 11: WebGL
- Unit12: High-Level Graphics Tools and APIs (Vizard)
- Unit13: Course Project (design a 3D game)

University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):
You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:
1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.

2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else’s words, ideas, or data as
one’s own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one’s own work also constitutes plagiarism.

**Nonacademic misconduct (See Student Handbook)**
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor’s ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

**Sexual misconduct (See Student Handbook):**
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

**Attendance Policy:**
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student’s course grade being reduced or in assignment of a grade of “F”. Absences are accumulated beginning with the first day of class.

**Student Academic Appeals Process**
Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor’s assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.