



Course title and number    VIST 271-501, Computing for Visualization II (3-0). Credit 3.  
Term                            Spring 2016  
Meeting times and location   MWF 11:30am – 12:20pm, Architecture Bldg. C, Room 307

## Course Description and Prerequisites

This course is a continuation of Computing for Visualization I; concepts of object oriented programming; emphasis on principles and techniques useful for 3D visualization and real time graphics.

Building on the principles introduced in VIST 270, students will learn advanced topics in C++ programming and concepts of object-oriented programming in C++. In addition, students will learn the mathematical foundations for computer graphics. This course includes programming projects designed to promote familiarity with 2D and 3D graphics concepts.

Prerequisites: MATH 152 or equivalent, VIST 270 (Computing for Visualization I)

## Learning Outcomes or Course Objectives

The learning objectives for the course are as follows:

- Develop a comprehensive knowledge of C++, Data Structures, Algorithms and OpenGL
- Design and use object-oriented programs
- Write programs that manipulate, named 2/3D coordinate systems, points, vectors
- Develop analytical approaches to and solve problems relevant to computer graphics

## Instructor Information

Name                            Michael Ringham  
Telephone number        979.845.0703  
Email address            [ringham@email.tamu.edu](mailto:ringham@email.tamu.edu)  
Office hours                By appointment  
Office location            Student Computing Center, Room 4.210B

## Teaching Assistant

Name                            Bailey Currie  
Email address            [bcc107020@email.tamu.edu](mailto:bcc107020@email.tamu.edu)

## Textbook and/or Resource Material

You are not required to purchase all these books. However, it is recommended that you have at least one book on C/C++ programming and one book on OpenGL programming. Additional books and references may be provided on the course website.

- *C++ Primer Plus (5<sup>th</sup> Edition)*  
Stephen Prata  
Sams, ISBN: 13:978-0672326974
- *OpenGL: A Primer (3<sup>rd</sup> Edition)*  
Edward Angel  
Addison Wesley, ISBN: 13:978-0321398116
- *OpenGL Programming Guide (7<sup>th</sup> Edition)*  
Dave Shreiner  
Addison-Wesley, ISBN: 13:978-0321552624
- *How to Think like a Computer Scientist: C++* by Allen Downey  
<http://greenteapress.com/thinkcpp/>

### Grading Policies

#### *Grading*

Assignments	50%
Quizzes	20%
Final Exam	20%
Class Participation	10%

#### *Late work*

Submit all assignments before 11:59 PM (unless otherwise noted) on the day they are due. Penalties for work submitted after day and time it is due are the following:

- Within one week – 10%
- Between one week and two weeks – 15%
- More than two weeks – 20%
- More than three weeks – 30%

Points will be taken off after work is graded. You are responsible for submitting work correctly.

#### *Standard Letter Grading Scale:*

- A = 90-100
- B = 80-89
- C = 70-79
- D = 60-69
- F = <60

### Attendance Policy

"The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at <http://student-rules.tamu.edu/rule07>."

### Course Topics, Calendar of Activities, Major Assignment Dates

5 quizzes throughout semester

<b>Week</b>	<b>Topic</b>
1	Course Introduction; review of OpenGL
2	Sorts (insertion, selection, bubble); Dynamic Allocation and Lists
3	Stacks, Queues; Games and interactive techniques; Recursion
4	Recursively maintained linked lists; Binary Trees; Spatial Subdivision
5	Quad trees; Search trees with removal

- 6 C++; Object-oriented programming; Constructors and Destructors
- 7 Classes; Interface and implementation; Separate compilation
- 8 Operator overloading; Default parameters, overloading stream IO; Inheritance
- 9 Vectors, Basic operations and uses in graphics
- 10 Matrices and Vectors; Affine transformations and homogenous coordinates
- 11 Curve drawing; 2D parametric curves
- 12 Parametric curves; 3D graphics in OpenGL (transformations)
- 13 OpenGL modeling and viewing
- 14 OpenGL projections and shading

Final Exam: 10:30 AM – 12:30 PM, Tuesday May 10, 2016

### **Other Pertinent Course Information**

Plagiarism: In this course, we want to encourage collaboration and the free interchange of ideas among students and in particular the discussion of homework assignments, approaches to solving them, etc. However, we do not allow plagiarism, which, as commonly defined, consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have any questions regarding plagiarism, please consult the latest issue of the [Texas A&M University Student Rules](#), under the section on [Scholastic Dishonesty](#).

"It is unlawful for any person to damage or deface any of the buildings, statues, monuments, trees, shrubs, grasses, or flowers on the grounds of any state institutions of higher education (Texas Education Code Section 51.204)" The words damage or deface refer specifically to any and all actions, whether direct or indirect, that either diminish the value or mar the appearance of the physical environment.

### **Americans with Disabilities Act (ADA)**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>

### **Academic Integrity**

For additional information please visit: <http://www.tamu.edu/aggiehonor>

*"An Aggie does not lie, cheat, or steal, or tolerate those who do."*

*Note: Professor reserves the right to alter the syllabus if situations arise that deems it necessary to do so.*