



Course title and number VIST 270-501, Computing for Visualization I (3-0). Credit 3.
Term Fall 2015
Meeting times and location TR 11:10am – 12:25pm, ARCC 307

Course Description and Prerequisites

This course provides an introduction to the theory and practice of visual computer based problem solving; system tools; scripting; software design principles and practice; basics of interactive programming and interface design; development concepts and principles useful in digital art and visualization production.

Understanding the technical basis for computer-based visualization allows the student to venture beyond the limitations of existing software applications. VIST 270, Computing for Visualization I, introduces the fundamentals of visualization management and developmental techniques. Emphasis will be placed on 2D concepts and techniques. These principles provide the background for higher level coursework, personal exploration/practices, and basic research within the context of visualization and/or real-time graphics.

Prerequisites: MATH 151 or equivalent

Learning Outcomes or Course Objectives

The learning objectives for the course are as follows:

- Discuss mathematical and data organizations useful in computer graphics programming.
- Discuss the history, theory and terminology relevant to computing, design and visualization.
- Define programming concepts and procedures.
- Examine the basics of 2D graphics programming using a high level language and graphics library.
- Outline the visualization computing environment, tools, practices and procedures.

Instructor Information

Name Michael Ringham
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Email address ringham@email.tamu.edu
Office hours By appointment
Office location Student Computing Center, Room 4.210B

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++ programming and one book on OpenGL programming. Additional books and references may be provided on the course website.

- *Linux for Programmers and Users*
Graham Glass & King Ables
Prentice Hall, ISBN: 0-13-185748-7
- *C++ Primer Plus (5th Edition)*
Stephen Prata
Sams, ISBN: 13:978-0672326974
- *Introduction to Programming with C++ (2nd Edition)* by Daniel Liang,
Prentice Hall, ISBN: 0-13-609720-0
- *Computer Graphics with OpenGL (3rd Edition)*
Donald Hearn & Pauline Baker
Prentice Hall, ISBN: 0-13-015390-7
- *Computer Graphics: Programming in OpenGL for Visual Communication*
Steve Cunningham
Prentice Hall, ISBN: 0-13-145254-1
- *OpenGL Programming Guide*
Dave Shreiner, Mason Woo, Jackie Neider & Tom Davis
Addison-Wesley, ISBN: 0-321-17348-1
- *Python Phrasebook* by Brad Dayley, ISBN: 0-672-32910-7
- *How to Think like a Computer Scientist: C++* by Allen Downey
<http://greenteapress.com/thinkcpp/>
- *Think Python: How to Think like a Computer Scientist* by Allen Downey
Green Tea Press
<http://www.greenteapress.com/thinkpython/thinkpython.html>
- *Dive Into Python* by Mark Pilgrim
<http://diveintopython.net/>

Grading Policies

Grading

Assignments	50%
Exams	40%
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

Midterm exam during week 7

Week	Topic	Required Reading
1	Course Introduction; Computing Basics; Linux basics – 1 (utilities, file management, shell commands)	Course notes – Sections 1 & 2
2	Linux basics – 2 (utilities, file management, shell commands); Introduction to programming; C/C++ programming: Language overview; Program structure and organization; Basic output	Course notes – Sections 3 & 4
3	C/C++ programming: Data types/operators; Expressions; Function parameters; Control flow; Decision controls and loop variants; Basic input	Course notes – Sections 5 & 6
4	C/C++ programming: Advanced data types (Arrays, strings); Functions; Flow control	Course notes – Sections 7
5	C/C++ programming: Sorting	Course notes – Sections 8
6	OpenGL programming: Introduction to OpenGL and GLUT; Window management	Course notes – Sections 9 & 10
7	OpenGL programming: Introduction to OpenGL and GLUT; Window management; OpenGL callback routines; Midterm	Course notes – Section 11
8	OpenGL programming: Input devices; C/C++ programming: Introduction to classes	Course notes – Sections 12 & 13
9	C/C++ programming: working with structures; scope of variables; introduction to pointers	Course notes – Sections 14 & 15
10	C/C++ programming: Dynamic memory and linked lists	Course notes – Sections 16
11	C/C++ programming: Input and output with files	Course notes – Sections 17
12	OpenGL programming: Callback registrations	Course notes – Sections 18
13	Scripting: Python programming	Course notes – Section 19
14	Final review	

Final Exam: 3:00 PM – 5:00 PM, Friday December 11, 2015

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.