

Introduction to Computer Graphics

COMP 360

Instructors

Professor

Ron Goldman

DH -- 3116

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T,Th 1:30–2:30 P.M. or by appointment

Labbie

Linda Hill

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M, W 10:00-11:00AM. or by appointment

Web Page

Exams

- Posted the Week of the Exam

Labs

- Posted 2-3 Weeks Before Due Date

Grading

Exams

- HW + Midterm + Final -- Probably Take Home
- 50% of Final Grade

Required Labs

- 3 Programming Assignments
 - each approximately 2-3 weeks long
- 50% of Final Grade

Extra Credit Lab (Optional)

- At End of Semester
- Worth up to a Full Letter Grade

Required Labs

- 3 Programming Assignments
 - Length -- each approximately 2–3 weeks long
- Work in self selected pairs
- Change partners after every assignment
- Language -- C++ and OpenGL
- Lab -- Symonds II

Tutorial on C++ and OpenGL

Place

Symonds II Lab

Time

Wednesday 7:00 PM

or

Thursday 7:00 PM

PC Password for Symonds II Account

See Instructions -- Comp 360 Web Page

Symonds II Lab

Access Restricted

Will Obtain Access for All Students

Required Labs -- Grading

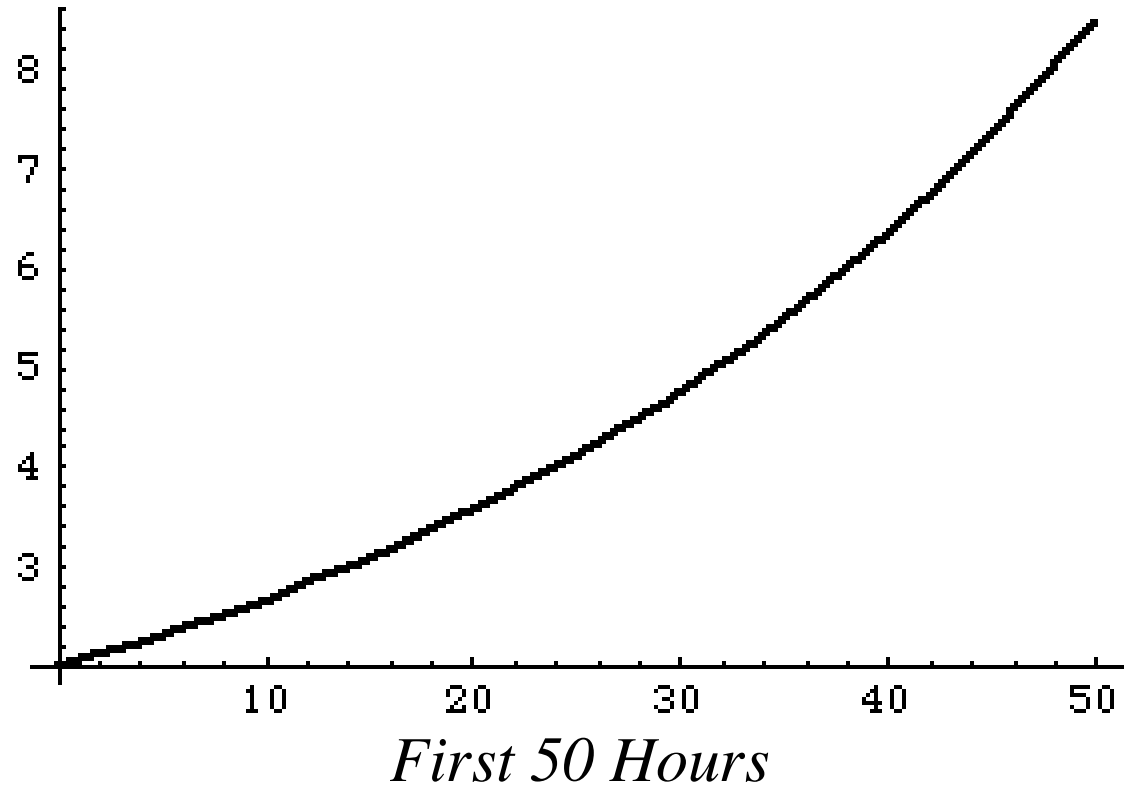
- 50% of Final Grade
- Late Policy: $G_{Late} = G_{OnTime} - 2 \times 2^{H/24}$
 - $G = Grade$
 - $H = Hours Late$
- Consulting -- Permitted
- Copying Code = Cheating

Late Policy

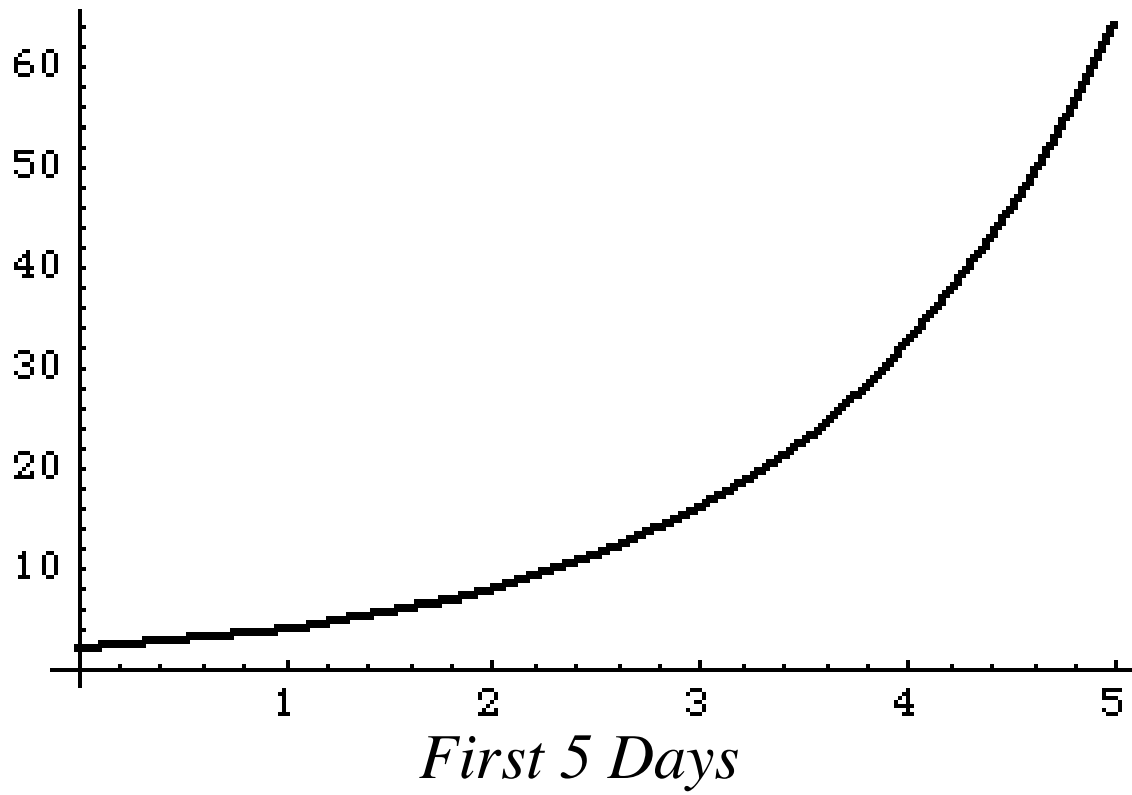
$$G_{Late} = G_{OnTime} - 2 \times 2^{H/24}$$

<u>$H=Hours\ Late$</u>	<u>$Penalty=2 \times 2^{H/24}$</u>
$0.00000001 = 10^{-8}$	2
12	2.8
$24 = 1\ day$	4
$2 \times 24 = 2\ days$	8
$3 \times 24 = 3\ days$	16
$4 \times 24 = 4\ days$	32
$5 \times 24 = 5\ days$	64

Penalty Function



Penalty Function



Grading (continued)

Final Grade

- $\text{Grade} = 50\%(\text{Exams} + \text{HW}) + 50\%(\text{Labs})$

Extra Credit Lab (Optional)

- at end of the course
- for students who did poorly on some previous assignments
- for A students who wish to be exempt from the final exam
- worth up to a full letter grade
- see programming projects at end of various chapters

Exams

Midterm and Final

- Probably Take Home
- 50% of Final Grade

Exam Questions

- 95%–100% from Exercises at End of Each Chapter

Required Text

*An Integrated Introduction to Computer Graphics and
Geometric Modeling*

-- Ronald Goldman

-- CRC Press

References

General References

- Computer Graphics: Principles and Practice
-- Foley, Van Dam, Feiner, Hughes
- Computer Graphics -- Hearn and Baker

Fractals

- Turtle Geometry -- Abelson and DiSessa
- Fractals Everywhere -- Barnsley

(On Reserve in Fondren)

References (continued)

Freeform Curves and Surface -- Bezier and B-Spline

- Curves and Surfaces for Computer Aided Geometric Design: A Practical Guide -- Farin
- Pyramid Algorithms: A Dynamic Programming Approach to Curves and Surfaces for Geometric Modeling -- Goldman

(On Reserve in Fondren)

Lectures

Class Discussion -- Informal

- Answer Questions on Contents of Each Chapter
- Solve Problems at End of Each Chapter

Preparation -- Crucial

- Read Text
- Submit Brief Written Essay and Questions
- Each Student Responsible for the Solution to One Exercise

Attendance -- Mandatory

- 1 Point Off Final Grade
 - For Each Class Missed Without Valid Excuse
 - For Each Class Attended Without Sufficient Preparation

Written Essay

Purpose

- To Prepare for Class Discussion

Format

- One Typed Page
- Grammatically Correct and Coherent English

Topic Headings

- Main Themes of the Chapter -- Not a Summary
- What I Learned from Reading the Text -- Not a Summary
- The Most Important Concept(s) in the Chapter
- What I Did Not Understand in the Text
- Errors in the Text
- Questions on the Text and on End of Chapter Problems

Syllabus

2-Dimensional Computer Graphics (Fractals)

- Turtle Graphics 1.5 Weeks
- Affine Graphics 1.5 Weeks

Mathematical Methods for Computer Graphics

- Coordinate Free Methods 1.5 Weeks
 - Dot and Cross Products
 - Determinants
- Vector and Matrix Techniques 1.5 Weeks
 - Affine and Projective Transformations
 - Quaternions

Syllabus (continued)

3-Dimensional Computer Graphics (Realistic Rendering)

- Recursive Ray Tracing 1 Week
- Surface Modeling 1 Week
- Solid Modeling 1 Week
- Polygonal Modeling 1 Week
 - Hidden Surface Algorithms -- 1 Lecture
 - Shading Algorithms -- 1 Lecture
- Radiosity 1 Week
- Freeform Curves and Surfaces 2 Weeks
- Other Topics As time permits

Prerequisites

Trigonometry

- Trigonometric Identities
- Law of Sines and Law of Cosines

Vector Geometry and Vector Algebra

- Addition, Subtraction, Scalar Multiplication
- Dot Product, Cross Product, Determinant

Matrix Algebra

- Matrix Multiplication

Calculus

- Differentiation