



Course Syllabus

Course Instructor	Prof. Zahir M. Hussain					
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Title	Computer Graphics					
Course Description	This course focuses on using computer to make general 2D & 3D graphics and shapes. Also, it handles shape operations (like scaling, translation, rotation). Design of algorithms with implementation in c++ is a must.					
Course Objective	Teach students how to design algorithms and implement them in c++ (and, if necessary, basic MATLAB) to make graphics. For example, how to draw geometric shapes like lines, circles, general mathematical functions, and specific shapes like a home or an electrical circuit. 3D graphics are also handled.					
Textbook	Z. M. Hussain, Computer Graphics, University of Kufa Press, 2013.					
References	D. Hearn, M. P. Baker, Computer Graphics, Prentice-Hall, 1991.					
Course Assessment	Tests	Laboratory	Quizzes	Project	Assignments	
	80%	20%			Team	individual
General Notes						



Course Weekly Outline

Week	Date	Topics Covered	Lab. Experiment	Notes
1	Week 1	1-General introduction	Intro to Visual C++	
2	Week 2	2- line drawing algorithms - Analysis - General method	Line Segment Drawing	
3	Week3	3-line drawing algorithms - General method - Bresenham algorithm	Design of Bresenham Algorithm	
4	Week 4	4. 3-line drawing algorithms - DDA algorithm	Design of DDA Algorithm	
5	Week 5	5. Circle drawing algorithms • General method • Bresinham algorithm	Design of Circle Bresenham Algorithm	
6	Week 6	6. Analysis Design of Polygons	Design of triangles and general polygons	
7	Week 7	Exam1		
8	Week 8	Analysis and Plotting of general mathematical functions using c++	Design of algorithms for mathematical functions	
9	Week 9	Exam2		
10	Week 10	Two Dimensional Representation 1. General Introduction	Design of simple 2D drawings	
11	Week 11	2. Matrix Representation of object	Design of matrices using c++	
12	Week 12	3. Shape Processing -I • Scaling • Shifting	Implementation of scaling, shifting of shapes	
13	Week 13	4. Shape Processing -II • Rotation about the origin • Rotation about arbitrary point	Implementation of rotation algorithms	
14	Week 14	5. Intro to Synthetic Images	Design of basic images	
15	Week 15			
16	Week 16			

17	Week 17	Three Dimensional Representation 1. General Introduction	Design of general shapes- example 1: home	
18	Week 18	2. Matrix Representation of object	Design of general shapes- example 2: electric circuit	
19	Week 19	3. Intro to Vector Analysis	Vectors on C++	
20	Week 20	4. Equations of line in 3D	Design of 3D line, sphere	
21	Week 21	5. 3D Shape Processing -I i. Scaling ii. Shifting	Design of 3D scaling	
22	Week 22	6. 3D Shape Processing -II iii. Rotation about x, y, x	Design of 3D rotation-I	
23	Week 23	7. 3D Shape Processing -III iv. Rotation about any point	Design of 3D rotation-II	
24	Week 24	Exam3		
25	Week 25	8. Different 3D Examples	Examples on 3D processing	
26	Week 26	9. Reflection of 3D about axis	Design of 3D reflection-I	
27	Week 27	10. Reflection of 3D about a 3D line	Design of 3D reflection-II	
28	Week			
29	Week			
30	Week	Final exam		



Instructor Signature:

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