Course Specifications

General Information

Course name	Computer Graphics
Course number	ITCS3310
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - Introduce students with the computer graphics concepts.

2 - Introduction to computer graphics goals and computer graphics applications.

3 - To introduce many important algorithms th at are useful for presenting data visually on a computer.

4 - Distinguish the capabi lities of different levels of graphics software and hardware and describe the appropriateness of each.

5 - .Explain the operation of the Bresenham algorithm for rendering a line on a pixel -based display .

6 - .Discuss attributes of output primitives .

7 - Discuss the basic tra nsformations (Trans lation, rotat ion, scaling, and reflection) in 2-D and 3-D

8 - .Explain viewing pipeline and clipping operat ions.

9 - Study of the three-dimensional concepts using to obtain photo realistic images.

10 - Introduce three-dimensional obje ct rep resen tations .

11 - Study of plane equation and 3D modeling

12 - Discuss computer animation

13 - Leraning animations of figures in 2D and 3D

14 - Learning 3D concepts, parallel projection and perspective projection

Intended Learning Outcomes

Knowledge and Understanding	* a1. Understand computer graphics software and hardware used in graphical systems * a2. Understand output primitives: lines, conics, filled polygons * a3. Understand principles, concepts, and algorithms of Computer Graphics
Intellectual Skills	* b1. Recognize coordinate representation and graphics functions of general graphics packages * b2. Compare between alternative 3D objects representations * b3. Analyze computer graphics algorithms
Professional Skills	* c1. Code developing * c2. Understanding relation of algebra and geometry to computation algorithms used in Computer Graphics
General Skill	* d1. Discuss various concepts of 3D projection, illumination and viewing * d2. Preliminary knowledge in an example of 3D geometry and connectivity * d3. Capacity to create graphical design, using appropriate output primitives, attributes and animation

Course Contents

1 - Output Primitives and Attribute of Output Primitives : Points. Line and circle Drawing Algorithms, Color and Gray Scale Level
2 - Applications of Computer Graphics, Introduce to Computer Graphics
3 - Two-Dimensional Geometric Transformations: Translation, Rotation, Scaling, Reflection
4 - Two-Dimensional Viewing: point clipping , Line clipping Algorithms, Polygon clipping
5 - Three-Dimensional Concepts, Three-Dimensional Object Representations, Three-Dimensional Geometric And Modeling Transformations

Teaching and Learning Methods

1 - Lectures
2 - Exercises
3 - Projects

Students Assessment

Assessment Method	TIME	MARKS
Mid-Term Exam	6th week	30
Projects and /or Assignments	12th week	20
Final Exam	16th week	50

Books and References

Course note	Lecture Notes
Essential books	Computer Graphics C version Second Edition, Donald Hearn and M. Pauline Baker, Prentice Hall Int., 1997

Knowledge and Skills Matrix

Main Course Contents	Study Week	Knowledge and Understanding	Intellectual Skills	Professional Skills	General Skill
Applications of Computer Graphics, Introduce to Computer Graphics	1-3	a1	b1	c1	d3
Output Primitives and Attribute of Output Primitives : Points. Line and circle Drawing Algorithms, Color and Gray Scale Level	4-6	a2	b2	c1, c2	d3
Two-Dimensional Geometric Transformations: Translation, Rotation, Scaling, Reflection	7-9	a3	b1, b3	c1, c3	d3
Two-Dimensional Viewing: point clipping , Line clipping Algorithms, Polygon clipping	10-12	a3	b3	c1	d3
Three-Dimensional Concepts, Three-Dimensional Object Representations, Three-Dimensional Geometric And Modeling Transformations	13-15	a3	b2	c1, c2	d1, d2, d3