

Faculty of Computers and Information Technology

Computer Graphics

Information :

Course Code : DM341

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Department of Computer Science

Instructor Information :

Title	Name	Office hours
Lecturer	Mohamed Ahmed Hussein Ali	

Area Of Study :

Use and adopt fundamental and basic mathematics in transformation for 2D and 3D drawing.
 Use all available principles and tools to optimize line drawing.
 Comprehend deeply the basic concepts of computer graphics to be ready for further and continuous learning.
 Show a complete understanding of drawing curves and design a solution for these requirements.
 Develop and evaluate the texture and lighting techniques.
 Compare and evaluate different methods to perform filling areas

Description :

Introduction to Computer Graphics; Overview of Graphics systems; Line drawing algorithms; Circle drawing algorithms; Ellipse drawing algorithms; Area filling algorithms; Polygon filling algorithms; Line clipping algorithms; Polygon clipping algorithms; Two dimensional transformations; (translation . Rotation . Scaling . General transformations . Composite transformations); Three dimensional object representation and Projections; Three dimensional modeling and transformations (translation . Rotation . Scaling . Sheer . Reflection . Composite); Three dimensional Viewing and Camera Model. Visible surface detection algorithms; Reflection and illumination models

Course outcomes :

a. Knowledge and Understanding: :

1 -	Explain the principles and techniques of lighting to a seen based on local reflection model
2 -	Identify the difference between 2-D and 3-D transformations
3 -	Describe the projection of 3-D views on 2-D plane using parallel and perspective projection

b. Intellectual Skills: :

1 -	Differentiate between the computer generated pictures and raster images
2 -	Propose a set of alternative solutions to implement transformation of shapes
3 -	Analyze complex computation problems with less computational approaches, and decompose a complex problem to set of tasks

c. Professional and Practical Skills: :

1 -	Deploy effective supporting tools to implement texture and lighting models on pictures
2 -	Apply effective information to perform transformations and its inverse to the 2D and 3D pictures
3 -	Apply effective information to design and implement graphics based applications in 2D and 3D views using OPENGL

d.General and Transferable Skills: :

1 -	Write technical Report
2 -	Communicate with others and work in a team and involvement in group discussion and seminars

ABET Course outcomes :

1 -	Use and adopt fundamental and basic mathematics in transformation for 2D and 3D drawing
2 -	Use advanced techniques and tools to optimize line drawing
3 -	Demonstrate adequate understanding of basic concepts of computer graphics to be ready for further and continuous lifelong learning
4 -	Demonstrate adequate understanding of drawing curves and design a solution for these requirements
5 -	Develop and evaluate texture and lighting techniques
6 -	Compare and evaluate different methods to perform filling areas

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Computer generated picture elements, attributes and uses.	4	2	2
Mapping real window with coordinates to a device window.	4	2	2
Rastering line segment, polyline and polygon.	4	2	2
Graphics Output Primitives	4	2	2
General functions drawing and 2D transformations.	4	2	2
Filling Region Techniques	4	2	2
Parallel and Perspective Projections	4	2	2
3D Transformations	4	2	2
Mid Term Exam	2		
Textures	4	2	2
Lightening	4	2	2
Clipping and Containments	4	2	2
Project Presentation	4	2	2
Final Exam			

Teaching And Learning Methodologies :

Interactive Lectures including Discussions
Tutorials
Practical Lab Sessions
Self-Study (Project / Reading Materials / Online Material / Presentations)
Case Studies

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	5.00	4	

Final Exam	40.00	14	
Midterm Exam (s)	20.00	9	
Others (Participations)	5.00		
Quizzes	10.00	5	
Team Work Projects	10.00	12	

Course Notes :

An Electronic form of the Course Notes and all the slides of the Lectures is available on the Students Learning Management System (Moodle)

Web Sites :

IEEE Computer Graphics and Applications.
<https://www.computer.org/cga/>