

Faculty of Computers and Information Technology

Computer Graphics

Information :

Course Code : DM341

Level : Undergraduate

Course Hours : 3.00- Hours

Department : Digital Media Technology

Instructor Information :

Title	Name	Office hours
Lecturer	Heba Hamdy Ali Hussien	
Teaching Assistant	Mona Mohamed Mohamed Ali Almakhton	
Teaching Assistant	Mahmoud Magdy Mohamed Abdo	

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

b.Intellectual Skills: :

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

c. Professional and Practical Skills: :

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

d. General and Transferable Skills: :

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

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	2		

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		
Practical Exam	10.00	11	
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/>