

**Faculty of Computers and Information Technology**

**Computer Graphics**

**Information :**

**Course Code :** ITC 341

**Level :** Undergraduate

**Course Hours :** 3.00- Hours

**Department :** Department of Computer Science

**Instructor Information :**

Title	Name	Office hours
Lecturer	Heba Hamdy Ali Hussien	
Teaching Assistant	Mahmoud Magdy Mohamed Abdo	6

**Area Of Study :**

Introduction, history and survey of graphics applications. Overview of graphics systems and output devices. Output primitives including points, lines, circles, splines, area filling, and character generation. Attributes of output primitives. Two dimensional transformations, windowing and clipping. Interactive input methods. Introduction to three-dimensional graphics. Principals of Color

**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, shear, reflection, composite); Three dimensional Viewing and Camera Model. Visible surface detection algorithms; Reflection and illumination models; Rendering algorithms for 3-D objects; Parametric representation of 3-D objects ; Shadows algorithms; 2-D texture mapping ; 3-D texture mapping; Ray tracing; Volume rendering; Anti-Aliasing ; Introduction to fractals; 3-D computer animation ; Color Space in Computer Graphics.

**Course outcomes :**

**a.Knowledge and Understanding: :**

1 - To understand the principles of computer graphics

**b.Intellectual Skills: :**

1 - Understand the mathematics, algorithms design, and Programming skills needed to develop graphics applications

**c.Professional and Practical Skills: :**

1 - Use OpenGL programming language, and associated libraries, to develop graphics objects

**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to Graphics	4	2	2
Display Technology	4	2	2

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Topic	No. of hours	Lecture	Tutorial / Practical
Output primitives	4	2	2
Attributes of graphics primitives	4	2	2
Geometric transformation-1	4	2	2
Geometric transformation -2	4	2	2
Midterm -1	3	1	2
2-D Viewing	4	2	2
3-D Concept	4	2	2
Midterm-2	3	1	2
3_D Object Representation	4	2	2
3-D Transformation geometric & Modeling	4	2	2
3-D Viewing	4	2	2
Graphics Color	4	2	2

### Teaching And Learning Methodologies :

Lectures  
Exercises  
Presentation  
Projects  
Open Discussion  
E. Learning  
Web-Site searches  
Self Studies  
Case Study

### Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	5.00	4	
Attendance	5.00	2	
Final Exam	40.00	12	
Midterm Exam I	15.00	7	
Midterm Exam II	15.00	10	
Project	20.00	11	To develop graphics objects

### Recommended books :

1. Francis S. Hill, Jr., Computer Graphics Using OpenGL, 2nd edition, Prentice Hall, 2000.
2. Foley J., Van Dam, A., Feiner, S., Hughes, J., C Edition, Interactive Computer Graphics: Principles and Practice, 2nd edition, Addison . Wesley, 1996.