# **CP209: Computer Graphics**

<b>Teaching Scheme</b>			Credits	Marks Distribution				
				Theory Marks		Practical Marks		Total
L	Т	P	С	ESE	CE	ESE	CE	Marks
4	0	2	6	70	30	30	20	150

#### **Course Content:**

Sr.	T	Teaching
No.	Topics	Hrs.

## 1 **Basic of Computer Graphics:**

05

Basic of Computer Graphics; Applications of computer graphics; Display devices; Random and Raster scan systems; Graphics input devices; Graphics software and standards.

## **2** Graphics Primitives:

12

Points; lines; circles and ellipses as primitives; scan conversion algorithms for primitives; Fill area primitives including scan-line polygon filling; inside-outside test; boundary and flood-fill; character generation; line attributes; area-fill attributes; character attributers.

#### 3 **2D** transformation and viewing:

15

Transformations (translation; rotation; scaling); matrix representation; homogeneous coordinates; composite transformations; reflection and shearing; Affine transformations; viewing pipeline and coordinates system; window-to-viewport transformation; clipping including point clipping; line clipping (Cohen-Sutherland; Liang- Bersky; NLN); polygon clipping (Sutherland Hodgeman & Wailer-Atherton).

# 4 <u>3D transformation and viewing:</u>

08

3D scaling; rotation and translation; composite transformation; viewing pipeline and coordinates; parallel and perspective transformation.

5	3D object representation:	12
	Surface modeling; Polygon mesh representation; curved and surfaces; quadric surfaces; spline representation; cubic spline; interpolation methods; Bazier curves and surfaces; B-spline curves and surfaces.	
6	Advanced topics:	05
	Visible surface detection concepts; back-face detection; depth buffer method; Illumination and Shading.	
7	Study of Recent Developments in Multicore Graphics Processors:	03

#### **Reference Books:**

- 1. D. Hearn and P. Baker, "Computer Graphics", Pearson Education C Version.
- 2. Foley and van Dam, "Computer Graphics"; Person Education.
- 3. Hearn and Baker, "Computer Graphics with Open GL", Pearson.
- 4. David F Rogers, "Procedural Elements for Computer Graphics", TMH.
- 5. David F Rogers, "Mathematical Elements for Computer Graphics", TMH.
- 6. Jason Sanders and Edwards Kandrot, "CUDA by example, an introduction to generalpurpose GPU programming", Addison-Wesley.

**60** 

Total Hrs.