II Year MCA II Semester　　　　　**L　T　P　To　C**

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MC218　COMPUTER GRAPHICS
ELECTIVE– II

Objective of the Course:

　　Computer graphics is the art and science of communicating information using images that are generated and presented through computation. This requires (a) the design and construction of models that represent information in ways that support the creation and viewing of images,(b) the design of devices and techniques through which the person may interact with the model or the view, and (c) the creation of techniques for rendering the model.The goal of this course in computer graphics is to engage the person's visual centers alongside other cognitive centers in understanding.

UNIT - I　　　　　　　　　　　　　　　　　　　　　**(10 Hrs)**

Introduction: Application areas of Computer Graphics, overview of graphics systems, video-display devices,raster-scan systems, random scan systems, graphics monitors and work stations and input devices.

UNIT - II　　　　　　　　　　　　　　　　　　　　　**(14 Hrs)**

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms.
Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms
Attributes of output primitives: Line attributes, character attributes and antialiasing.

UNIT - III　　　　　　　　　　　　　　　　　　　　　**(12 Hrs)**

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.
2-D viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT - IV　　　　　　　　　　　　　　　　　　　　　**(12 Hrs)**

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.
3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT - V　　　　　　　　　　　　　　　　　　　　　**(12 Hrs)**

3-D object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods.

Text Books :

1. Donald Hearn and M.Pauline Baker "Computer Graphics *version*",, Pearson Education.
2. Amerendra , N Sinha , and Arun D Udai, " Computer Graphics" , Tata McGraw Hill

Reference Books :

1. C, Foley, VanDam, Feiner and Hughes "Computer Graphics Principles & practice", second edition in C, Pearson Education.
2. Zhigand xiang, Roy Plastock, Schaum's outlines "Computer Graphics Second edition", , Tata Mc- Graw hill edition.
3. David F Rogers ,Procedural elements for Computer Graphics, Tata Mc Graw hill, 2nd edition.
4. Neuman and Sproul, "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Shalini Govil, Pai, Principles of Computer Graphics, 2005, Springer.
6.   Steven Harrington ,Computer Graphics, TMH.