# College of IT and Management Education

## Lesson Plan

**Sub** : Computer Graphics and Multi Media (MCC-402)
**Branch** : MCA
**Semester** :**4th** Semester MCA(Jan-June,2017)
**Name of the Faculty** : Susanta Kumar Behera
Total Credit Point: 3 Total Number of Classes: 40

| Sl. No. | TOPIC PLANNED | SESSION |
|---|---|---|
| | **MODULE-I** | **17 Hours** |
| 1 | Survey of Computer graphics, Overview of Graphics System | 1 |
| 2 | Video Display Devices, Raster-Scan Systems, | 1 |
| 3 | Input Devices, Hard-Copy Devices, Graphics Software, | 1 |
| 4 | Introduction to OpenGL Graphics Output Primitives: Point and Lines | 1 |
| 5 | Simple DDA line –drawing algorithm | 1 |
| 6 | Bresenham's Line drawing | 1 |
| 7 | Midpoint Circle Drawing Algorithm ,Midpoint Ellipse generation | 1 |
| 8 | Filled-Area Primitives. Attributes of Graphics Primitives: Point, line, curve attributes, | 1 |
| 9 | Fill area attributes, fill methods for areas with irregular boundaries | 1 |
| 10 | Anti-aliasing, Geometric Transformations (both 2-D & 3-D): Basic Geometric Transformations in Matrix form | 1 |
| 11 | Homogeneous Representation and Composite Transformation | 1 |
| 12 | Reflection, shear, Transformation between coordinate systems, Affine Transformations | 1 |
| 13 | Two Dimensional Viewing: Viewing pipeline, Clipping Window, Normalization & Viewport | 1 |
| 14 | coordinate Transformations, Clipping Algorithms: Point clipping, Line clipping | 1 |
| 15 | Sutherland Hodgmann Polygon clipping. | 1 |
| 16 | Projection Transformations Orthogonal, Oblique parallel | 1 |
| 17 | Perspective projection | 1 |
| | **MODULE-II** | 14 |
| 18 | Three Dimensional Object Representations: Curved Surfaces, Quadratic Surfaces | 1 |
| 19 | Spline Representations, Bezier Spline Curves and Surfaces | 1 |
| 20 | B-Spline Curves and Surfaces | 1 |
| 21 | Octrees, BSP Trees | 1 |
| 22 | Fractal Geometry Methods, Shape Grammars. | 1 |
| 23 | Back Face Detection Algorithms, | 1 |

| | | |
|---|---|---|
| 24 | Depth-Buffer method, A-Buffer Method, | 1 |
| 25 | Scan line and Depth Sorting, Area subdivision Method, | 1 |
| 26 | Ray Casting Method. | 1 |
| 27 | Illumination Models: Basic Illumination Models, | 1 |
| 28 | Displaying light Intensities, Halftone Patterns and Dithering techniques | |
| 29 | Polygon-Rendering Methods (Gouroud Shading, Phong Shading) | 1 |
| 30 | Ray Tracing Methods (Basic Ray-Tracing Algorithm, Ray-Surface Intersection Calculations). | 1 |
| 31 | Computer Animation, Hierarchical Modeling (introductory idea only). | 1 |
| | **MODULE-III** | 9 |
| 32 | Multimedia & Hypermedia, WWW, Multimedia software tools, Multimedia Authoring and Tools, Graphics and Image Data Representation | 1 |
| 33 | Color Models in images & video | 1 |
| 34 | Fundamental Concepts in Video. Basics of digital Audio. | 1 |
| 35 | Basics of Information Theory, Run length coding, Variable length coding | 1 |
| 36 | Lossy Compression Algorithms (distortion measure, quantization, Discrete Cosine transform) | 1 |
| 37 | Basic Image Compression standard-JPEG | 1 |
| 38 | JPEG | 1 |
| 39 | Basic Video Compression standard-MPEG (MPEG-1&2) | 1 |
| 40 | MPEG | 1 |

Text Books:


1. Donald Hearn & M. Pauline Baker, "*Computer Graphics with OpenGL*", Third Edition, 2004, Pearson Education, Inc. New Delhi.
2. Ze-Nian Li and Mark S. Drew, "*Fundamentals of Multimedia*", First Edition, 2004, PHI Learning Pvt. Ltd., New Delhi.


Reference Books:


1. Jennifer Burg, "*The Science of Digital Media*", First Edition, 2009, Pearson Education Inc., 2. Francis S. Hill & Stephen M. Kelly, "*Computer Graphics using OpenGL*", Third Edition, 2007, PHI Learning Pvt. Ltd., New Delhi.
3. Zhigang Xiang, Roy A. Plastock, "*Computer Graphics*", Second Edition, 2007, McGraw-Hill Education (India), New Delhi.
4. Leen Ammeral, Kang Zhang, "*Computer Graphics for Java Programmers*", Second Edition, 2007, Wiley India Pvt. Ltd., New Delhi.
5. Edward A. Angel, "*Interactive Computer Graphics: A Top-Down Approach Using OpenGL*", Fifth Edition, 2009, Pearson Education Inc., New Delhi.


**Faculty** **Course Coordinator** **Principal**