

MM9131 3D MODELING AND RENDERING

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UNIT I INTRODUCTION 9

3D rendering pipeline, 3D Geometric primitives – Bezier, B-Splines, NURBS, fractals, Particle systems, 3D transforms – Deform modifiers, Solid modeling – poly modeling, Surface modeling – tessellation - Extruded shapes - Mesh approximations to smooth objects – sphere, cylinder - Hierarchical modeling-Physically based modeling.

UNIT II TEXTURE MAPPING 9

Procedural and Bitmap textures - Texture mapping an image – Bump mapping – Environment mapping – Interpolation - Magnification and Minification, Mipmapped textures - Adding textures on to curved surfaces - Animated textures, Tiling - rendering textures.

UNIT III LIGHTS AND CAMERA 9

Shading models – Diffuse and specular reflections – Ambient light – Combining light contributions – Adding Color –Flat Shading – Smooth Shading -Phong, Gouraud. Camera Basics - Camera Movement - Directing the Camera.

UNIT IV RENDERING AND ANIMATION 9

Wire frame –Hidden surface removal– Ray tracing methods – Volume Rendering - Radiosity methods – Kinematics, Rigid body animation, collision detection.

UNIT V 3D GRAPHICS PROGRAMMING 9

3D Graphics programming using OpenGL and Java 3D or JOGL – Creating a 3D Scene by setting up objects – view - lights and other attributes.

TOTAL = 45

REFERENCES

1. F. S. Hill Jr., Stephen Kelly, "Computer Graphics Using OpenGL", 3rd Edition, Pearson Education/PHI Learning, 2007.
2. Mark Giambruno, " 3D Graphics and Animation", 2nd Edition, New Riders Press, 2002.
3. Donald Hearn, M. Pauline Baker, "Computer Graphics – C Version", Pearson Education/ PHI Learning, 2004.
4. Chen, Jim X., Chen, Chunyang, "Foundations of 3D Graphics Programming using JOGL and Java 3D, Springer, 2nd edition, 2008.
5. James D. Foley, Andries van Dam, K. Feiner, John F. Hughes, "Computer Graphics- principles and practice", Pearson Education, Second Edition, 2003.
6. Alan Watt, "3D Computer Graphics", Addison Wesley/Pearson Ed., 3rd Edition, December 1999.