

ED5151 COMPUTER APPLICATIONS IN DESIGN

DETAILED SYLLABUS

UNIT I INTRODUCTION TO COMPUTER GRAPHICS FUNDAMENTALS

Output primitives (points, lines, curves etc.), 2-D & 3-D transformation (Translation, scaling, rotation) windowing - view ports - clipping transformation.

UNIT II CURVES AND SURFACES MODELING

Introduction to curves - Analytical curves: line, circle and conics – synthetic curves: Hermite cubic spline- Bezier curve and B-Spline curve – curve manipulations. Introduction to surfaces - Analytical surfaces: Plane surface, ruled surface, surface of revolution and tabulated cylinder – synthetic surfaces: Hermite bicubic surface- Bezier surface and B-Spline surface- surface manipulations.

UNIT III NURBS AND SOLID MODELING

NURBS- Basics- curves, lines, arcs, circle and bi linear surface. Regularized Boolean set operations - primitive instancing - sweep representations - boundary representations – constructive solid Geometry - comparison of representations - user interface for solid modeling.

UNIT IV VISUAL REALISM

Hidden – Line – Surface – solid removal algorithms shading – coloring. Introduction to parametric and variational geometry based software's and their principles creation of prismatic and lofted parts using these packages.

UNIT V ASSEMBLY OF PARTS AND PRODUCT DATA EXCHANGE

Assembly modeling - interferences of positions and orientation - tolerances analysis – mass property calculations - mechanism simulation. Graphics and computing standards– Open GL Data Exchange standards – IGES, STEP etc– Communication standards.

For Syllabus, Question Papers, Notes & many More

REFERENCES:

1. David F. Rogers, James Alan Adams “Mathematical elements for computer graphics” second edition, Tata McGraw-Hill edition.
2. Donald Hearn and M. Pauline Baker “Computer Graphics”, Prentice Hall, Inc., 1992.
3. Foley, Wan Dam, Feiner and Hughes – Computer graphics principles & practices, Pearson Education – 2003.
4. Ibrahim Zeid Mastering CAD/CAM – McGraw Hill, International Edition, 2007.
5. William M Neumann and Robert F.Sproul “Principles of Computer Graphics”, Mc Graw Hill Book Co. Singapore, 1989.

OBJECTIVE:

To impart knowledge on computer graphics which are used routinely in diverse areas as science, engineering, medicine, etc.