2012-13

PVP SIDDHARTHA INSTITUTE OF TECHNOLOGY

(COURSE STRUCUTRE FOR AUTONOMOUS SCHEME)

I Year M. Tech. (Machine Design) M.E.	**T**	**P**	**C**
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MEMD2T5A - GEOMETRIC MODELING

(Elective-III)

UNIT-I

Introduction: Definition, Explicit and implicit equations, parametric equations. Transformations: Cartesian and homogeneous coordinate systems two dimensional and three Dimensional transformations – scaling, rotation, Shearing, Zooming, viewing transformation, reflection, rotation about an axis, concatenation.

UNIT-II

Cubic Splines-1: Algebraic and geometric form of cubic spline, tangent vectors, parametric space of a curve, blending functions, four point form, reparametrization, truncating and subdividing of curves.

UNIT - III

Bezier Curves: Bernstein basis, equations of Bezier curves, properties, derivatives.

UNIT – IV

B-Spline Curves: B-Spline basis, equations, knot vectors, properties and derivatives.

UNIT – V

Introduction: Surface Models, Surface Representation. Parametric Representation of Analytic Surfaces - Plane Surface, Ruled Surface, Surface of Revolution, Tabulated Cylinder.

UNIT – VI

Parametric Representation of Synthetic Surfaces - Hermit Bi-cubic Surface, Bezier Surface, B-Spline Surface, Coons Surface, Gaussian curvature.

UNIT – VII

Solid modeling concepts: Wire frames, Boundary representation, half space modeling, spatial cell, cell decomposition, classification problem.

UNIT – VIII

Solids: Tri-cubic solid, Algebraic and geometric form.

Text Books:

1. Geometric Modeling by Micheal. E. Mortenson, McGraw Hill Publishers
2. Elements of Computer Graphics by Roger & Adams Tata McGraw Hill.