SUBJECT NO-ME21010, SUBJECT NAME- GEOMETRIC MODELLING FOR DESIGN AND MANUFACTURE

LTP- 3-1-0,CRD- 4

SYLLABUS :-

CAD and Geometric Modelling for integrated, manufacturing and quality engineering. Unified modelling approach to geometric approach design and conceptual design. Properties of geometric models and representation schemes; Fundamentals of surface modelling and volumetric modelling; tools and techniques. Set-theory. Constructive Solid Geometry (CSG), Boundary Representation (B-rep), Feature based modelling, Integrated Polytrees. Freeform surface modelling. Explicit v/s parametric surfaces. Continuity considerations.Model validation using Eulers, Euler-Poincare laws, completeness and unambiguity.Feature based Modelling; Graph theoretic models and representation of design.Solid Model kernels used in CAD. CAD data representation. Data formats for Analysis. Data exchange formats for geometric models. Information structures and Standards.Applications of the CAD towards downstream product design and manufacture stages: Prototyping and manufacturing Ã¢ÂÂ description and conversion to FEM/BEM Mesh; faceted and tessellated surfaces Ã¢ÂÂ STL etc. Geometric Modelling for mass-property representation.Advanced topics may be briefly referencedTolerance modeling: Variational Solid Modelling for Geometric Tolerance and Dimensioning. Interference analysis and Automated tolerancing.Modelling for Assembly: Spatial reasoning and constraint analysis. Automated assembly planning.