

AMM-25 COMPUTER AIDED GRAPHICS AND PRODUCT DESIGN

UNIT-1 INTRODUCTION TO CAD

- 1.1 Design process, Fundamentals of CAD: Role of computers in design. Computer Graphics: Raster scans graphics, Coordinate system, Database structure for graphic modeling
- 1.2 Transformation of geometry: Translation, Rotation, Reflection, Scaling, Homogenous representation, Projection: Orthographic projection, Isometric Projection.

UNIT-2 GEOMETRIC MODELING:

- 2.1 Requirement of Geometric Modelling, Geometric models, Geometric Construction Methods, Wireframe modeling, Curves representation, Curve fitting,
- 2.2 Synthetic Curves: Cubic splines, Bezier curve.
- 2.3 Surfacing: Surface of revolution, ruled surface. Solid Representation concepts: B-Rep, CSG.
- 2.4 CAD Standards: Standardization in graphics, Exchange of modeling data- IGES, Standard for the exchange of product model data (STEP), Drawing Exchange Format, DMIS.

UNIT-3 INTRODUCTION PRODUCT DESIGN:

- 3.1 Definition, Design by Evolution, Design by Innovation, Essential factors of Product Design, Morphology of Design, Role of Allowance,
- 3.2 Primary design phases and flow charting, Process capability and Tolerance in detailed design and assembly, Product strategies, Product characteristics,
- 3.3 Designer and his role, Basic design considerations, Types of Models designed by designers.

UNIT-4 COMPUTER & DESIGN

- 4.1 Product cycle & CAD/CAM, Role of computer in design process. Modern approaches to
- 4.2 Product Design: Concurrent Design, Quality function deployment. New Product
- 4.3 Development: New product development, Model utilized in various phases, managing product life cycle,
- 4.4 Diffusion models: Models of first purchase.

Reference books:

1. Rogers, D. F. and Adams, A., Mathematical Elements for Computer Graphics, McGrawHill Inc., NY, 1989.
2. Groover and Zimmer, CAD / CAM : Computer Aided Design & Manufacturing, Prentice Hall, 1984.
3. Karl.T.Ulrich, Steven D.Eppinger, Anita Goyal Product Design and Development Tata McGrawHill , 2009