

2. COMPUTER AIDED DESIGN AND MANUFACTURING (CAD/CAM)

Module I (6 hours)

Fundamentals of CAD: Design process, Applications of computer for design, Creating the Manufacturing Database, The Design workstation, Graphical Terminal, Operator input Devices, Plotters and other devices, Central Processing Unit, Memory types.

Module II (12 hours)

Computer graphics Software and Database: Configuration, Graphics Packages, Constructing the Geometry, Transformations of geometry, Database structure and content, Wire frame versus solid modeling, Constraint– Based modeling, Geometric commands, Display control commands, Editing.

Module III (10 hours)

Geometric Modeling: Types of Curves and Curve Manipulations, Types of Surfaces and Surface Manipulations, Solids: Introduction, Geometry and Topology, Solid Entities, Fundamentals of Solid Modeling, Boundary Representation (B-rep), Constructive Solid Geometry (CSG) – examples, Sweeps and Solid Manipulations Feature based Modeling: Introduction, Feature Entities, Parametrics, Feature Manipulations

Module IV (8 hours)

CAM – Numerical Control and NC Part Programming: Numerical Control, Numerical Control elements, NC Coordinate system, NC motion control system, Manual and Computer Aided programming, the APT language, Miscellaneous Functions, M, Advanced part-programming methods.

Problems with conventional NC, NC technology: CNC, DNC, Combined DNC/ CNC system, Adaptive control manufacturing systems, Computer Integrated Manufacturing system, Machine Tools and related equipment, Materials Handling system: AGV, Robots, Lean manufacturing. Group Technology: Part Classification and coding, OPIZE and MICLASS code system.

Text and Reference Books:

1. CAD/CAM Computer Aided Design and Manufacturing, M.P.Goover and E.W.Zimmers, Jr., Pearson
2. CAD/CAM Theory and Practice, Zeid and Subramanian, TMH
3. CAD/CAM Principles, Practice and Manufacturing Management, McMahon and Browne, Pearson Education
4. CAD/CAM Concepts and Applications, C.R.Alavala, PHI
5. Computer Aided Design and Manufacturing, Lalit Narayan, Mallkarjuna Rao and Sarcar, PHI
6. CAD/CAM Theory and Concepts, K.Sareen and C.Grewal, S.Chand Publication
7. CAD/CAM/CAE, N.K.Chougule, Scitech
8. Principle of Interactive Computer Graphics, W.W.Newman, R.F.Sproull, TMH