

III Year B.Tech. Mechanical Engg. II - Semester	L	T	P	To	C
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ME324 CAD / CAM

Course Description & Objective:

To familiarize the students with drafting, design, modeling and manufacturing aspects using computers.

Course Outcomes:

1. Students will understand the basic structure of CAD, CAM and product development.
2. They got the knowledge on working of various input and output devices in computer.
3. They will understand the, how the line was generated on computer screen.
4. They learn, the mathematical form of object/drawing transformations in 2D and 3D.
5. They will understand, the methodology developed for representation of curves and importance of parametric form.
6. Got the knowledge on usage of Boolean operations in solid modeling.

UNIT - I Introduction to CAD/CAM:

Definitions, Applications, product life cycle, Automation, Types of automation, Advantages of CAD/CAM, Basic structure, Input & output devices, CAD procedure, DDA algorithm.

UNIT - II Transformation of Geometry:

2-D, 3-D and Homogenous Coordinate systems, Translation, Scaling, Reflection and Rotation.

Geometric modeling- Requirements, Primitives and Boolean operators, Wireframe model, Curve representation, Cubic Splines, B-splines, Bezier-Curves, Surface model, Solid model - Sweep representation.

UNIT - III NC/CNC Machines:

Introduction, NC components, NC procedure, NC coordinate systems and NC motion control Systems. Applications of NC, Economies of NC, NC Machining center. Computer controls in NC-Introduction to CNC, DNC.

UNIT - IV NC Part Programming:

NC co-ordinate system. Axis movements and interpolation with other axes. Application of rotary axis, Part programming fundamentals. Manual part programming - Programming formats, G-codes and M-codes. Introduction to

Computer Assisted part programming-APT language. Computer aided process planning (retrieval type system and generative type system).

UNIT - V Group Technology & Flexible Manufacturing System:

Introduction, part families, parts Classification and Coding systems, design and manufacturing attributes, Production Flow Analysis (Rank order clustering technique), Benefits of GT. Basics of FMS and lean-manufacturing methods.

TEXT BOOKS:

1. Ibrahim Zeid, "CAD/CAM Theory and Practice", 2nd ed., Tata Mc Graw Hill, 5th reprint, 2010.
2. Koren, "Computer Control of Manufacturing Systems", 2nd ed., Tata Mc Graw Hill, 2nd reprint 2006.

REFERENCE BOOKS:

1. Groover M.P., "Automation Production Systems and Computer Integrated Manufacturing", 4th ed., Prentice Hall of India, 2014.
2. P.N.Rao, "CAD/CAM Principles and Applications" 3rd ed., Tata McGraw Hill, 2nd reprint 2010.
3. David F.Rogers and J.Alan Adams, "Computer Graphics", 2nd ed., Tata McGraw Hill, 2002,
4. Kundra T.K. Rao P.N. & Tewari N.K, "Computer Aided Manufacturing", 1st ed., Tata McGraw Hill, 13th reprint 2008.