

NIRMA UNIVERSITY
Institute of Technology, School of Engineering
M Tech Mechanical Engineering (CAD-CAM)
Proposed Teaching & Examination Scheme w.e.f. 2019-20

L	T	P	C
3	0	2	4

Course Code	3ME1213
Course Title	Computer Aided Manufacturing

Course Outcomes (COs):

After successful completion of the course, students will be able to-

1. illustrate the basic principles of part programming for CNC machining,
2. select and apply appropriate operations, cutting parameters, cutting tools and software to machine a part,
3. create and optimize a part program for machining a component,
4. justify the importance of FMS and CIM in manufacturing industry.

Syllabus:

Teaching Hours: 45

Unit I

05 hours

Numerical Controls: Types, evolution of controllers, components of NC/CNC system, specification of CNC system, classification of NC /CNC machines, transducers used, salient features, constructional details of CNC machines, axis designation, NC/CNC tooling.

Unit II

20 hours

Fundamentals of Part Programming: Types of format, word address format, manual part programming for lathe and milling machine operations, subroutines, do loops, canned cycles, parametric subroutines. Computer-assisted programming languages, Automatically Programmed Tools language-types of statement, command and programming, CAD based CNC programming using CAM software.

Unit III

10 hours

Flexible Manufacturing System: Definition, Group Technology, description and need of FMS, manufacturing cell, FMS application, System support equipment: Automated Guided Vehicle, Automated Storage and Retrieval Systems, Coordinate Measuring Machine, Cleaning and Washing stations, Analysis of FMS, Application of JIT and GT to FMS.

Unit IV

10 hours

Computer Integrated Manufacturing: Scope, need and benefits of CIM, CIM wheel, CIM database and database management systems, Fundamentals of networking and networking technologies.

Self-study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Laboratory work:

Laboratory work will be based on above syllabus with minimum 10 experiments/exercise to be incorporated.

Suggested Readings:

1. M P Groover, Automation, Production Systems, and Computer-Aided Manufacturing, Prentice-Hall.
2. T.K. Kundra, P.N.Rao, N.K. Tewari, Numerical Control and Computer Aided Manufacturing, Tata McGraw Hill Education.
3. S.K.Sinha, CNC Programming, Galgotia Publications.
4. P.Rathakrishnan, Computer Numerical Control (CNC) Machines, New Central Book Agency.
5. William W. Luggen, Flexible Manufacturing Cells and System, Prentice Hall
6. P. Radhakrishan and S. Subramanyam, CAD CAM and CIM, New Age International.
7. S. Kant Vajpayee, Computer Integrated Manufacturing, Prentice Hall of India.

L=Lecture T= Tutorial P=Practical, C=Credit

w.e.f. academic year 2019-20 and onwards