10 ME 41A COMPUTER INTEGRATED MANUFACTURING

IV B.Tech I Semester

(with effect from the academic year 2013-2014)

Credits: 4

Lectures/week: 4 Hrs. *Sessional Marks: 40*

University Exam:3 Hrs *End Examination Marks: 60*

UNIT-I

AUTOMATION: Types of Automation, Reasons for Automation, CAD, CAM, CIM, FMS, CAPP, Concepts. Conventional Manufacturing Vs CIM, Functions in Manufacturing, Processing operations, Organization, Database for CIM, Shop Floor Control, Factory data collection system, Business Functions, e-Governance, e-Manufacturing.

UNIT-II

NC, DNC and CNC: NC – Position and Motion control in NC, Accuracy and Repeatability, Basic types of Machining Processes – Punched tape and Taped format – Part Programming Methods: Manual Part Programming, Computer Assisted Part Programming (including APT and Mohr's statements), Manual Data Input, NC Part Programming using CAD/CAM, Computer Automated Part Programming.

UNIT-III

Materials Handling: Analysis of M.H. Systems, Design Considerations of conveyor systems. Automated Guided Vehicle Systems (AGVS). Definition, Types, Vehicle guidance technologies, applications. Analysis of AGVS. Applications of Robots in Materials Handling. Material Storage: Storage system performance, Automatic Storage and Retrieval Systems (AS/RS), Definition, concepts, types, basic components, applications. Concept of automated WIP storage, advantages. Interfacing handling and storage with manufacturing.

UNIT-IV

Adaptive Control (AC), Concepts, Types of AC systems, Working and benefits. Automatic identification of Bar code, Radio frequency, magnetic strip, OCR, and Machine Vision Technology (concepts). Information Retrieval; Computer Networks in Manufacturing. Hierarchy of concepts in Manufacturing, Advantages, Networks Topologies: Star, Ring, Bus, LAN, WAN, Communication and Transmission – Twisted – Pair wire, Coaxial Cable, Fibre Optic Lines, Manufacturing Automation Protocol (MAP).

UNIT-V

Simulation in Manufacturing : definition, different types of Simulation, simulation methodology, applications of simulation in manufacturing advantages and drawbacks of simulation, salient features of the simulation languages like GPSS, SIMSCRIPT, SIMAN /CINEMA and SLAM. Salient features of simulation packages in manufacturing and materials handling like Auto Mod-II, Pro model, SIM FACTORY, X cell +, and Quest.
Economic justification of CAD /CAM/CIM Technologies in Indian Context.

TEXT BOOKS:

1. Automation, Production System and CIM : M.P. Groover (PHI, Ltd)
2. CAD/CAM/CIM : P.Radha Krishnan, S.Subramanyam (Wiley Eastern)

REFERENCES:

1. CAD/CAM : Besant and Lui (East West Press Ltd.)
2. CAD/CAM : P.N.Rao (TMH)
3. Simulation Modeling and Analysis: Law, Kelton (TMH)