

B.Tech. VIII SEMESTER MECHANICAL ENGINEERING							
COURSE CONTENTS (AICTE FLEXIBLE CURRICULA)							
ME-8301	Computer Integrated Manufacturing	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	-	2	4	70	22

Unit I

Introduction: Introduction to CIM, modern manufacturing, integration and rationalization, elements of CIM system, CIM hardware and software, implementing CIM, advantages and limitations.

Unit II

Product Development in CIM: Product development cycle, sequential and concurrent engineering, implementation of concurrent engineering, soft and hard prototyping, Taguchi method, value engineering, product life cycle.

Unit III

Graphics and Geometric Modeling: Raster scan, coordinate systems, database for graphic modeling, PDM, PIM, EDM, basic transformation of geometry – translation; scaling; rotation and mirror, need for CAD data standardization, developments in drawing data exchange formats, 2D and 3D line, surface and volume models, linear extrusion and rotational sweep, constructive solid geometry, basics of boundary presentation – spline, Bezier, b-spline and NURBS, sculpture surfaces.

Unit IV

Computer Aided Manufacturing (CAM): Principles of NC machines, CNC, DNC, NC modes of point to point, line and 2D, 3D contouring, NC part programming, preparatory functions (G), miscellaneous (M) codes, ATC, modular work holding and pallets, adaptive control, simple part programming examples.

Unit V

Robot, Automated Material Handling and Storage System: Robot anatomy, robot configuration, robot control systems, accuracy, repeatability, end effectors, robot programming, robot application, automated material handling and storage system, type of material handling system, automated guided vehicle system, automated retrieval systems.

Recommended Books:

1. Automation, Production Systems and CIM by Mikell P. Groover; Pearson Education.
2. Computer Integrated Manufacturing by A. Alavudeen and N. Venkateshwaran; Prentice-Hall of India.
3. CAD/CAM Principles and Applications by P.N. Rao; Tata McGraw-Hill.
4. CAD/CAM/CIM by P. Radhakrishnan, S. Subramanyan and V. Raju; New Age Publication.

Suggested list of experiments:

1. Introduction of basic commands of AutoCAD.
2. Generation of two-dimensional model by using AutoCAD.
3. Generation of three dimensional models by using AutoCAD.
4. Introduction of CIM and its importance in manufacturing environment.
5. Study and demonstration of CNC lathe machine.
6. Study and demonstration of CNC milling machine.
7. Generation of G&M codes manually for lathe operations.
8. Generation of G & M codes manually for milling operations.
9. CNC part programming for lathe operations on CAM software.
10. CNC part programming for milling operations on CAM software.
11. Study of 4 axis robotic arm.

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2021-22 Jeyan

ME-8302

Code - ?

B.Tech. VIII SEMESTER MECHANICAL ENGINEERING							
COURSE CONTENTS (AICTE FLEXIBLE CURRICULA)							
HS-8302	Operations Research	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	-	2	4	70	22

Unit I

Introduction to Operations Research: Historical background, definitions, interrelationship with operations management, salient features of OR, various models of OR, methodologies and tools, application and pitfalls in the use of OR for decision making, limitations and future directions of OR, use of computers in modeling and problem solving, software like LINDO, LINGO, TORA, use of MS Excel in solving OR models.

Unit II

Linear Programming: Introduction, formulation of LPP, graphical method of solving LPP. limitations of Graphical method, simplex algorithm, solving LPP using simplex method, Big-M and Two-phase methods, special cases of multiple optima, infeasibility, unbounded solution and degeneracy, sensitivity analysis, unit contribution of resources, basic idea of primal and dual linear programming, application of LP model and its limitations.

Unit III

Transportation and Assignment Model: Introduction, terminology used in transportation model, assumptions, solution of transportation model, Balancing the unbounded model, North-West corner method, row minima and column minima method, initial solution. MODI method for optimal test, special cases of transportations model, degeneracy in transportation model, Hungarian method, maximization using assignment model, special cases of assignment model.

Unit IV

Waiting Line (Queuing) and Game Theory: Introduction, objectives and models of queuing. Important terms used in queuing theory, benefits and limitations, types of queuing models, single channel model, multichannel models, Little's formula, queue discipline etc.

Game Theory: Introduction, terms used, objectives and limitation of game theory, two-person- zero-sum game, pure and mixed strategies, saddle point, dominance, graphical, algebraic and LP methods for solving game theory problems.

Unit V

Project Management: Introduction to project management, appraisal of projects, network diagram, AOA and AON diagrams, PERT and CPM, slacks and floats, critical path determination, probability and project planning, project crashing etc., use of computer in project management.

Simulation: Introduction, scope, advantages and limitations of formulation, Monte-Carlo simulation technique, use of computers in simulation.

Recommended Books:

1. Introduction to Operations Research by F.S. Hillier and G.J. Lieberman; Tata McGraw Hill.
2. Operations Research principles and Practice by Ravindran, Philips and Solberg; Wiley India.
3. Theory and Problems of Operations Research by R. Bronson; Schaum Series; Tata McGraw Hill.
4. Introduction to Mathematical Programming by W.L. Winston; Duxbury Press.
5. Operations Research by H. Taha; Pearson Education.
6. Operations Research-Algorithms and Applications by R.P. Sen; Prentice-Hall of India.
7. Operations Research by Heera and Gupta; S. Chand.

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 2024-22
 Sem 2

BE VIII SEMESTER COMPUTER SCIENCE & ENGG.							
COURSE CONTENTS (AICTE FLEXIBLE CURRICULA)							
CS-8322	Data Science & Analytics	L	T	P	C	Max. Marks	Min. Marks
Duration	3 Hours	3	-	-	3	70	22

Unit I:

Introduction to Data Science: Concept of Data Science, What is Data science, When to use data science, Why we are using data science, advantages of data science, DATA various application of data science in real scenarios.

Unit II:

Models: Models in data science, Fields of data science, Concept of Data Mining, data virtualization, data warehousing, Business intelligence using data science.

Unit III:

Programming Tools for Data Science: Introduction to R, Basics of R, Visualizing Data: Bar Charts, Line Charts, Scatterplots, Working with data: Reading Files.

Unit IV:

Machine learning: Overview of Machine learning concepts, Types of Machine learning – Supervised, Unsupervised, Semi-supervised, Classification and Regression algorithms, support vector machines (SVM), decision trees and induction rules, Linear Regression-model, Analysis of Time Series, random forest, Neural Networks.

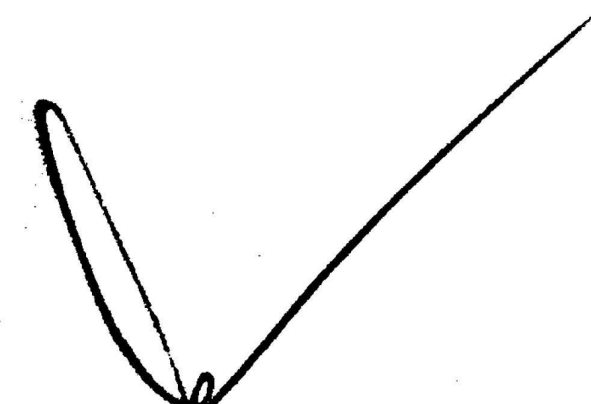
Unit V:

Case Study: Case Studies of Data Science Applications and Project, Weather forecasting, Stock market prediction, Object recognition, Real Time Sentiment Analysis

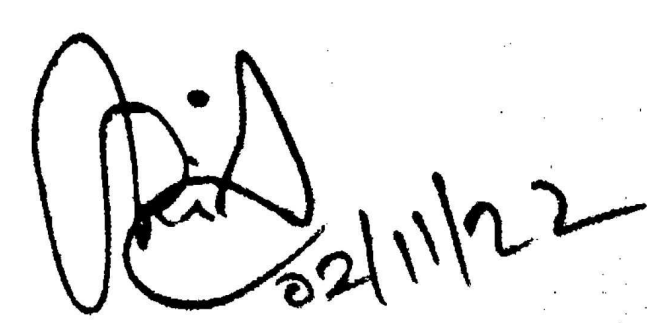
Suggested Reading:

1. R for data science by Hadley wickham
2. Machine learning with R by Brett lantz
3. R in Action by Robert I.Kabacoff.
4. Data visualization in R by Thomas rahlf


HOD (CS)


(B.O.S Member)


(B.O.S Member)


(B.O.S Chairman)