

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)**Scheme of Teaching & Examination****M. Tech. in CAD - CAM****III Semester**

S. No.	Board of Study	Subject Code	Subject	Periods per Week			Scheme of Examination			Total Marks	Credit L+(T+P)/2
				L	T	P	Theory / Practical				
							ESE	CT	TA		
1	Mech. Engg	558311 (37)	Database Management System	3	1	-	100	20	20	140	4
5	Refer Table – III		Elective-III	3	1	-	100	20	20	140	4
6	Mech. Engg	558321 (37)	Preliminary work on dissertation	-	-	28	100	-	100	200	14
7	Mech. Engg	558322 (37)	Seminar Based on dissertation	-	-	3	-	-	20	20	2
Total				6	2	31	300	40	160	500	24

L-Lecture, T- Tutorial, P- Practical, ESE- End Semester Examination, CT- Class Test, TA- Teacher's Assessment

Note : Duration of all theory papers will be of Three Hours.

Table-III

ELECTIVE- III			
S.No.	Board of Study	Subject Code	Subject
11	Mech Engg	558331 (37)	Computer Integrated Manufacturing
2	Mech Engg	558332 (37)	Computer Aided Production Management
3	Mech Engg	558333 (37)	Computational Fluid Dynamics

Note (1) – 1/4th of total strength of students subject to minimum of twenty students is required to offer an elective in the college in a Particular academic session.

Note (2) – Choice of elective course once made for an examination cannot be changed in future examinations.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **M. E. III**
Subject: **Database Management System**
Total Theory Periods: **40**
Total Marks in End Semester Exam. : **100**
Minimum number of class test to be conducted: **02**

Branch: **Mechanical Engineering**
Code: **558311 (37)**
Total Tutorial Periods: **12**

UNIT 1

Introduction: Data, Information, Record, File, File Organization like: Sequential, Indexed Sequential Random. Traditional file processing approach. Database approach of data management, Advantage of database approach over file processing approach.

Data Definition, Abstraction Models, Independence, Data Manipulation language, Data base manager and Administrator's System Signature.

UNIT 2

Entity Relation Model: Entity - Relationship, Attributes, Mapping constraints, Keys, E – R Diagrams and reduction to tables, Generalization and Aggregation, Extended E - R diagram.

UNIT 3

Relation Model: Structure, Relational algebra and calculus, Modification and views, SQL, QUEL, Integrity Constraints, Functional Dependencies.

UNIT 4

Relational Data Base Design: Pitfalls in RDB Design, Normalization using functional, Multivalued, Join dependencies, Domain key normal form, alternative approaches.

UNIT 5

SQL: Query languages, SQL as DDL, SQL as Query language, SQL as DML, Views in SQL.

TEXT BOOKS

1. H. K. Korth A. Silberschatz - Database System Concepts
2. C. J. Date – Introduction to Database System

REFERENCE BOOKS

1. J. D. Ullman – Principles of Database System
2. Bipin C. Desai -- Introduction to Database System, Galgotia Publication
3. Database Management system – R. Paneerselvan, PHI Publication
4. Fundamental of database system – R. Elmars, S. Navathe, Pearson Education

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **M. E. III**
Subject: **Computer Integrated Manufacturing**
Total Theory Periods: **40**
Total Marks in End Semester Exam. : **100**
Minimum number of class test to be conducted: **02**

Branch: **Mechanical Engineering**
Code: **558331 (37)**
Total Tutorial Periods: **12**

UNIT 1

Introduction: Evolution of CIM, scope of CIM, segments of generic CIM, Automated Process Planning – Process planning, group technology, variant and generative process planning methods, AI in process planning, process planning software. CNC technology – Principles of numerical control, features of CNC systems, programming techniques, capabilities of a typical NC CAM software, integration of CNC machines in CIM environment, DNC – Flexible manufacturing systems- Architecture, work stations.

UNIT 2

Manufacturing Systems: MRP II software, production control software, forecasting, master production schedule, materials requirements planning, capacity requirements planning, shop floor control, shop floor data collection techniques, inventory management, purchase orders, bill of materials, standard product routing, job costing, marketing applications.

UNIT 3

Robotics, Automated Assembly and Inspection: Types of robots and their performance capabilities, programming of robots, hardware of robots, kinematics of robots, product design for robotized manufacturing, selecting assembly machines, feeding and transfer of arts, applications of robots in manufacture and assembly, sensors. Automated quality control types of CMM, non-contact inspection methods, in process and post process metrology, flexible inspection systems. Computer Aided Inspection and on line quality monitoring.

UNIT 4

Data Communications and Technology Management: Technology issues, configuration management, database systems, management of technology, networking concepts, Local area Network (LAN), SQL fundamentals, Manufacturing Automation protocols (MAP) and Technical and office protocols (TOP) fundamentals.– CIM models, economics of CIM, implementation of CIM.

UNIT 5

Collabarative Engineering: Introduction, Faster Design throughput, Web based design, Changing design approaches, extended enterprises, concurrent engineering , supply chain management (SCM), customer relations management(CRM) Virtual Reality and Factory simulation, Agile and lean manufacturing, reverse engineering , Rapid prototyping.

TEXT BOOKS

1. Manufacturing Engineering and Technology – Serope Kalpakjian, and Steven R. Smith, Pearson education.
2. Automation , Production systems and Computer Integrated Manufacturing System – Mikell P.Groover, PHI Publication.

REFERENCE BOOKS

1. Computer Integrated Manufacturing Hand Book – Eric Teicholz and Joel Orr, McGraw Hill Publication.
2. Computer Integrated Manufacturing – Paul G. Ranky, CIMware Publishers.
3. CAD / CAM / CIM – Radhakrishnan, New Age International Publication.

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **M. E. III**
Subject: **Computer Aided Production Management**
Total Theory Periods: **40**
Total Marks in End Semester Exam. : **100**
Minimum number of class test to be conducted: **02**

Branch: **Mechanical Engineering**
Code: **558332 (37)**
Total Tutorial Periods: **12**

UNIT 1

Production Planning and Control (PPC) :Traditional PPC and its problems ,Symptoms of poor PPC system ,Operating priorities and principles ,Computer-integrated production management system, its need and requirement

UNIT 2

Forecasting: Various methods , Comparison of various methods and suitability to different products ,Use of computer in demand forecasting. **Aggregate Planning**: Performance measures ,Qualitative and quantitative methods.

UNIT 3

Master Production Scheduling: Types of scheduling and need for re-scheduling ,Use of computers in planning activities. **Cost planning and control ,Capacity planning, its need and different methods**: Manufacturing Resource Planning (MRP-II) ,Importance of Inventory and inventory management, Inventory management systems, Material requirement planning (MRP),Working and benefits of different types of inventory system ,Performance measures ,Lot sizing methods, Comparison with MRP ,Structure and functions, Computer based MRP-II systems.

UNIT 4

Just In Time (JIT): Introduction and its comparison with MRP, Pull and push system ,Kanban-Types and benefits. **Shop Floor Control (SFC) and Computer Process Monitoring**: Functions of SFC ,SFC system ,Operation scheduling and techniques of operation scheduling ,Factory Data Collection System ,Computer process monitoring.

UNIT 5

Supply Chain Management: Supply Chain management models, Cost benefit analysis. **Enterprise Resource Planning (ERP)**: Component and applications, ERP systems ,Tools for ERP, Problems in ERP.

TEXT BOOKS

1. Production Planning and Inventory Control – N.S.L. Mc Leavey, D.W. & P. J. Billington, PHI Publisher
2. Production Systems Planning Analysis and Control – J.L. Riggs, John Wiley & Sons.

REFERENCE BOOKS

1. Systems Approach to Computer Integrated Design and Manufacturing – Singh Nanua, John Wiley & Sons New York.
2. Manufacturing Planning and Control System – T.E. Volmann, W.L. Bery, D.C. Whybark, Galgotia Publicaiton.
3. Computer Aided Production Management – P.B. Mahapatra, PHI Publisher

CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI (C.G.)

Semester: **M. E. III**

Subject: **Computational Fluid Dynamics**

Total Theory Periods: **40**

Total Marks in End Semester Exam. : **100**

Minimum number of class test to be conducted: **02**

Branch: **Mechanical Engineering**

Code: **558333 (37)**

Total Tutorial Periods: **12**

UNIT 1

Typical partial differential equation in fluid dynamics. Types of second order equations, second order wave equations, system of first order equations, Finite difference and finite volume discretisation, Equation of Parabolic Type.

UNIT 2

Equation of hyperbolic type: Explicit schemes, Lax-Wendroff scheme and variants, Implicit schemes, Second order wave equation, Method of characteristics for second order hyperbolic equations, Equation of elliptic type: the laplace equation in two dimension, iterative methods for solution of linear algebraic systems, solution of the pentadiagonal system.

UNIT 3

The basic equations of fluid dynamics: Basic conservation principals, Unsteady Navier-Stokes equation it Integral form, Navier-Stokes equation it Differential form, Boundary conditions for Navier-Stokes equation. Reynolds averaged Navier-Stokes equations, Boundary layer, thin layer and associated approximations. Grid generation.

UNIT 4

Inviscid Incompressible Flow, Potential flow problem, panel Methods, panel methods for subsonic and supersonic flows, Inviscid compressible flow: Small perturbation flow, Numerical solution of the full potential equation.

UNIT 5

Boundary Layer flow: Physical consideration , the boundary layer equations, computations of laminar boundary layer, Turbulent boundary layers, Viscous Incompressible flow computation, stream function Vorticity approach, Viscous compressible flow, RANS, Turbulence Modelling, Basic computational methods for compressible flow.

TEXT BOOKS

1. Computational Fluid Dynamics -- T. J. Chung, Cambridge University Press
2. Text book of Fluid Dynamics – Frank Chorlton, CBS Publications.

REFERENCE BOOKS

1. Computational Methods for Fluid Dynamics – Gerziger and Peric, Springer Publication.
2. Numerical Methods in Fluid Flow & Heat Transfer – Dr. Suhas Patankar.
3. Introduction to Computational Fluid Dynamics -- P.Niyogi, S.K. Chakrabartty and M.K.Laha, Pearson education
4. Computational Fluid Dynamics -- J.A. Anderson, McGraw-Hill Publication