


**Scheme of Examination - THIRD SEMESTER**

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	CAD302T	Elective-V	3	-	-	3	30	70	100
2	CAD303T	Open Elective	3	-	-	3	30	70	100
3	CAD301P	Dissertation Phase-I	-	-	20	10	50	50	100
Total			6	0	20	16	110	190	300

CAD302T	Elective - V
CAD302T (i)	Supply Chain Management
CAD302T (ii)	Computational Fluid Thermodynamics



CAD303T	Open Elective
CAD303T(i)	Industrial Safety
CAD303T (ii)	Operations Research
CAD303T (iii)	Cost Management of Engineering Projects
CAD303T (iv)	Composite Materials
CAD303T (v)	Waste to Energy

		October 2022	1	Applicable for 2022-23
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Scheme of Examination - FOURTH SEMESTER

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	CAD401P	Dissertation Phase-II	-	-	32	16	200	200	400
Total			0	0	32	16	200	200	400

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**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
CAD302T(i)	Supply Chain Management	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
To provide knowledge of strategic importance of supply chain design and planning of an organization, the role of inventory management and forecasting in a supply chain, facility planning and scheduling models.	<ul style="list-style-type: none">• Define the goal of a supply chain and analysis the impact of supply chain• Decisions on the success of a firm and Identify drivers of supply chain performance.• Analyse demand forecasts and supply for both an enterprise and a supply chain• Apply operations planning, MRP, and aggregate planning concepts in a supply chain.• Design a supply chain network for a firm or organisation• Judge and select the best supplier for a firm or organisation

Unit I**[8Hrs]**

Introduction to Supply Chain Management: Understanding the supply chain, Supply Chain Performance- Achieving strategic fit and scope, complexity, key issues, Supply Chain Drivers and Metrics, Centralized vs. decentralized systems

Unit II**[8Hrs]**

Planning Demand and Supply in a Supply Chain: Forecasting-Need for forecasting, Quantitative methods. Inventory Management- Various costs in inventory management and need, Deterministic models and discounts, Probabilistic inventory management. Aggregate Planning The Role of Aggregate Planning, Aggregate Planning Strategies.

Unit III**[8Hrs]**

Facility Planning and Scheduling models: Facility layout and location-Qualitative aspects, Quantitative models for layout decisions, Product, process fixed position, group layout, Location decisions-quantitative models. Scheduling models-Scheduling in MRP system, Sequencing rules and applications, Batch production sequencing and Scheduling.

Unit IV**[8Hrs]**

Designing the Supply chain network: Distribution Networks-Design options for a distribution network, e-Business and the distribution network, Network design in an uncertain environment. Transportation Networks-Design options for a transportation network, Trade-offs in transportation design, Supply Chain Optimization

Unit V**[8Hrs]**

Managing Cross-Functional Drivers in a Supply Chain: Sourcing Decisions-Make or buy decisions, Third-and fourth-party logistics providers, Sourcing Processes. Pricing and Revenue Management in a Supply Chain, Information Technology in a Supply Chain, Coordination in a Supply Chain

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Supply Chain Management, strategy, planning, and operation	Chopra, S., and Meindl, P.	2nd	PHI
2.	Operations Management	Evans and Collier		
3.	Production and operations Management	R. Panneerselvan		Prentice Hall of India
4.				

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Logistics and Supply Chain Management	Christopher		Pearson Education Asia
2.	Manufacturing Operations and Supply Chain Management (The Lean Approach)	Taylor and Brunt		Business Press Thomson Learning, NY

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THIRD SEMESTER

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
CAD302T(ii)	Computational Fluid Thermodynamics	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
To provide knowledge of strategic importance of supply chain design and planning of an organization, the role of inventory management and forecasting in a supply chain, facility planning and scheduling models. The objective of the course is to impart knowledge on the fundamental aspects of computational methods used in the field of fluid and heat transfer. It discusses in detail the types of governing equations and their methods of solutions, types of boundary conditions, equations for turbulent flow and turbulent kinetic energy. It also aimed to discuss FDM and FVM and their applications in the field of diffusion, convection-diffusion and flow field problems.	<ul style="list-style-type: none">• Interpret the governing equations of the fluid flow, Heat transfer & Their Applications.• Have an in-Depth introduction to the methods and analysis techniques used In computational solutions of fluid mechanics And Heat transfer problems.• Explain the interaction of physical processes and Numerical techniques.• To develop mathematical model and write algorithms for the different fluid flow and Heat Transfer Problems. Be able to Use finite Differences And finite volume techniques

Unit I

[8Hrs]

Governing Equations And Boundary Conditions: Basics of computational fluid dynamics—Governing equations of fluid dynamics—Continuity, Momentum and Energy equations—Chemical species transport —Physical boundary conditions – Time-averaged equations for Turbulent Flow—Turbulent—Kinetic Energy Equations – Mathematical behaviour of PDEs on CFD -Elliptic, Parabolic and Hyperbolic equations.

Unit II

[8Hrs]

Finite Difference Method: Derivation of finite difference equations— Simple Methods – General Methods for first and second order accuracy—solution methods for finite difference equations—Elliptic equations—Iterative solution Methods—Parabolic equations – Explicit and Implicit schemes – Example problems on elliptic and parabolic equations.

Unit III

[8Hrs]

Finite Volume Method (FVM) For Diffusion: Finite volume formulation for steady state One, Two and Three-dimensional diffusion problems. One dimensional unsteady heat conduction through Explicit, Crank–Nicolson and fully implicit schemes.

Unit IV

[8Hrs]

Finite Volume Method For Convection Diffusion: Steady one-dimensional convection and diffusion—Central, upwind differencing schemes—properties of discretization schemes—Conservativeness, Boundedness, Transportiveness, Hybrid, Power-law, QUICK Schemes.

Unit V

[8Hrs]

Calculation Flow Field By FVM: Representation of the pressure gradient term and continuity equation—Staggered grid—Momentum equations—Pressure and Velocity corrections—Pressure Correction equation, SIMPLE algorithm and its variants. Turbulence models, mixing length model, Two equation (k- ϵ) models—High and low Reynolds number models.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Computational Fluid Dynamics	T. J. Chung		Cambridge University Press
2.	Computer Simulation of Flow and Heat Transfer	Ghoshdastidar, P.S		Tata McGraw Hill
3.	Computational Fluid Dynamics—The Basics with Applications	John D Anderson	1st	McGraw Hill

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Numerical Heat Transfer and Fluid Flow	Patankar, S.V.		Hemisphere Publishing
2.	Computations of Fluid Flow and Heat Transfer	Muralidhar, K., and Sundararajan, T		Narosa Publishing House

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**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
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CAD303T(i)	Industrial Safety	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
The objectives of subject is to prevent accidents in industry by reducing any hazard to minimum and to reduce workman's compensation, insurance rate and all the cost of accidents along with improvement in occupational health and safety and its management	<ul style="list-style-type: none">• Develop students to handle the complex industrial environment• Give knowledge about occupational health, industrial hygiene, accidental prevention techniques to the students.• Make the student aware about safety auditing and management systems, pollution prevention techniques etc.• Train the students about risk assessment and management in Industry

Unit I**[8Hrs]**

Occupation, Safety And Management; Occupational Safety, Health and Environmental Safety, Management – Principles & practices, Role of Management in Industrial Safety, Organization Behavior on Human factors contributing to accident. Global standards of safety.

Unit II**[8Hrs]**

Planning for Safety: Planning: Definition, purpose, nature, scope and procedure. Management by objectives and its role in Safety, Health and Management (SHE)

Unit III**[8Hrs]**

Monitoring for Safety, Health & Environment: Occupational Safety, Health and Environment Management System, Bureau of Indian Standards on Safety and Health: 14489 – 1998 and 15001 – 2000, ILO and EPA Standards. Principles of Accident Prevention: Definition: Incident, accident, injury, dangerous, occurrences, unsafe acts, unsafe conditions, hazards, error, oversight, mistakes etc.

Unit IV**[8Hrs]**

Education, Training and Employee Participation in Safety: Element of training cycle, Assessment of needs. Techniques of training, design and development of training programs. Training methods and strategies types of training. Evaluation and review of training programs. Competence Building Techniques (CBT), Concept for training, safety as a on-line function. Employee Participation: Purpose, areas of participation, methods, Role of trade union in Safety, Health and Environment Protection.

Unit V**[8Hrs]**

Management Information System: Sources of information on Safety, Health and Environment Protection. Compilation and collation of information, Analysis & use of modern methods of programming, storing and retrieval of MIS for Safety, Health and Environment. QCC HS Computer Software Application and Limitations.

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Industrial Safety , Health and Environment Management Systems	R.K. Jain and Sunil S. Rao		Khanna publishers, New Delhi
2.	Industrial Safety and Environment	A.K. Gupta		
3.				
4.				

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Industrial Safety, Health Environment and Security	Basudev Panda		

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**THIRD SEMESTER**

Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
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CAD303T(ii)	Operations Research	3	-	-	3	30	70	100

Course Objectives	Course Outcomes
<ul style="list-style-type: none">The objective of this subject is to apply optimization tools like LPP, dynamic programming problems, sequencing and scheduling, inventory models, project planning to Formulate and solve real life complex problems for strategic planning and decision making.	<ul style="list-style-type: none">Students should be able to apply the dynamic programming to solve problems of discrete and continuous variables.Students should be able to apply the concept of non-linear programmingStudents should be able to carry out sensitivity analysisStudents should be able to model the real world problem and simulate it.

Unit I**[8Hrs]**

Optimization Techniques, Model Formulation, models, General L.R Formulation, Simplex Techniques, Sensitivity Analysis, Inventory Control Models

Unit II**[8Hrs]**

Formulation of a LPP - Graphical solution revised simplex method - duality theory - dual simplex method - sensitivity analysis - parametric programming

Unit III**[8Hrs]**

Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem - max flow problem - CPM/PERT

Unit IV**[8Hrs]**

Scheduling and sequencing - single server and multiple server models - deterministic inventory models - Probabilistic inventory control models - Geometric Programming.

Unit V**[8Hrs]**



Competitive Models, Single and Multi-channel Problems, Sequencing Models, Dynamic Programming, Flow in Networks, Elementary Graph Theory, Game Theory Simulation

Text Books

S.N	Title	Authors	Edition	Publisher
1.	Operations Research, An Introduction	. H.A. Taha		PHI
2.	Principles of Operations Research	H.M. Wagner		PHI
3.	Introduction to Optimisation: Operations Research	. J.C. Pant		Jain Brothers, Delhi

Reference Books

S.N	Title	Authors	Edition	Publisher
1.	Operations Research	Hitler Libermann		McGraw Hill Pub
2.	Operations Research	Pannerselvam		Prentice Hall of India

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