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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE211	DES	Enterprise Resource planning and MIS	2	1	0	3	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):
To introduction with (A) Basic concepts of MIS (B) Planning Techniques of MIS (C) CBIS (D) ERP (E) DSS

Course Outcomes (COs):
After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Characteristics and Importance of Management Information System (MIS)
2. Understand the basic concepts of the role of C.B.I.S. in Management.
3. Characteristic Evolution & Applications of D.S.S., Difference between DSS and M.I.S. Office Automation System (OAS).
4. Evolutionary stages of Enterprise Resource Planning(ERP)

Syllabus

Unit - I
Introduction – (A) Introduction: Characteristics and Importance of information, Search, Storage and Retrieval of Information, Information Feedback system.
(B) Management Information System (MIS): Objectives & Cost Benefits of MIS, Management and System concept, Decision and MIS. Decision Environment Model. Functional Applications of MIS: Production Subsystem, Marketing Subsystem, Personnel Subsystem, Financial Subsystem.

Unit – II
Planning, Design and Implementation of MIS - Planning Techniques, Project Proposal, Reporting and Controlling, Information needs and sources, Conceptual Design, Detailed Design.

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Selection of Final Design. Organization for implementation and Training of Operational Personnel. Data Collection, Evaluation, Control and Maintenance of Information Systems.

Unit - III

Computer Based Information System (CBIS) - Role of C.B.I.S. in Management, Hierarchy of C.B.I.S., M.I.S. and C.B.I.S. family. M.I.S. in total C.B.I.S. environment. Types of C.B.I.S. Transaction Processing System (TPS): Overview of T.P.S., Techniques of T.P.S. Processing Modes of TPS.

Decision Support System (DSS): Definition, Characteristic Evolution & Applications of D.S.S., Difference between DSS and M.I.S. Office Automation System (OAS): Definition, Importance, Planning and Implementation of OAS, Computer based Office Communication System.

Unit – IV

Evolutionary stages of Enterprise Resource Planning(ERP) - Need for ERP, Variety accommodation, Strategic and operational issues in ERP, Integrated and Business model of ERP, Zachmann enterprise architecture, MRP and MRP-II.

Unit – V

Introduction to Business Process Re-Engineering - ERP Implementation: Role of consultants, vendors and users, Guidelines and Procedure for ERP implementation, strategic advantage through ERP, ERP Domain.

Reference Books:

1. *Planning Men at Work. Enterprise Resource Planning, Concept and Practice, Chhabra, Ahuja & Jain, PHI*
2. *Business Process Re-Engineering, Jayaraman, , TMH.*
3. *ERP by Alexis Leon*
4. *Management Information System, Kanter, PHI.*
5. *Management Information System, Murdick & Ross, PHI. 6. D. Base –III, Alan Simpson.*

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B. Tech. in Mechanical Engineering

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY		PRACTICAL		
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE221	DES	Facility Layout and Design	2	1	0	3	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):
To introduction with (A) Study of production facilities, including location, planning, design and maintenance, (B) product flow, space and activity relationships, personnel requirements, (C) , material handling.

Course Outcomes (COs):
After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Student would be able to understand the need define and analyze product, process and schedule design.
2. Student would be able to understand various available design algorithms theoretically and using necessary modern engineering tools.
3. Student would be able to analyses solve facility design problems through analyzing layout models.
4. Students would be able to prepare and present a facilities planning project report by using facility layout models-algorithms and applying standards of professional and ethical responsibility.
5. Students would be able to design and analyze material handling systems through different material handling equipment and material handling principles used in the warehousing, manufacturing and supporting operations.

Syllabus

UNIT I
INTRODUCTION OF PLANT FACILITY

Concept of Plant Facility, It's Scope, Importance and objectives. Nature of Location Decision, Need for facility location planning, General procedures and Factors influencing location decisions, Facility Location Models, economics and cost analysis, Rural and urban location.

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UNIT II
PLANT LOCATION
Plant location analysis – factors, costs, location decisions – single facility location models, multi facility location models- set covering problem – warehouse location problems.

UNIT III
FACILITIES LAYOUT
Facilities requirement, objective of plant layout and principles, advantages , factors influencing plant layout, types of manufacturing system, types of layout, plant layout procedure, line balancing.

UNIT IV
LAYOUT DESIGNS
Design cycle – SLP procedure, Industrial plant design considerations, types of production types of layout, factors affecting layout tools, Techniques & procedure used in workstation and plant layout, quantitative techniques in plant layout, developing Product and Process Layouts, Comparing Layouts, criteria for computerized facility layout, concept of computerized layout programs like CRAFT, CORELAP, ALDEP & PLANTET.

UNIT V
MATERIAL HANDLING AND PLANT MAINTNANCE
MATERIAL HANDLING
Scope and functions of Material handling , Manual mechanical Handling ratio, Principles of material handling , Analysis of material handling problem, Classification of Material Handling system, Material Handling in stores and warehouses , automation in part handling ,handling and industrial robots, Optimum allocation of Material Handling equipment Principles, unit load concept, material handling system design, selection and specification, containers and packaging
PLANT MAINTNANCE
Role of maintenance management , Organization & systems of maintenance management , Different types of maintenance management , Their purpose and features, Preventive and Predictive maintenance techniques, Introduction to Total Productive Maintenance: Concepts, Tools and Procedure

References

1. Tompkins, J.A. and J.A.White, "Facilities planning", John Wiley, 2003.
2. Richard Francis.L. and John A.White, "Facilities Layout and location – an analytical approach",
PHI., 2002.
3. James Apple, M.Plant layout and "Material Handling", John Wiley, 1977.
4. Pannerselvam,R, "Production and Operations Management", PHI,2007
5. Telsang M., "Industrial engineering & Production Management" S.Chand,2013

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE231	**DES**	**Reliability Analysis and prediction**	2	1	0	3	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs)

Topics covered include (A) reliability mathematics, organization and analysis of data, reliability modeling and system reliability evaluation techniques. (B) Environmental factors and stresses are taken into account in computing the reliability of the involved components. (C) The limitations of models, methods, procedures, algorithms and programmers are outlined. (D) The treatment of maintained systems is designed to aid the worker in analyzing systems with more realistic and practical assumptions. (E) Fault tree analysis is also extensively discussed, incorporating recent developments.

Course Outcomes (COs)

Having successfully completed the module, you should be able to demonstrate knowledge and understanding of the following:

1. Reliability, its model and evaluation techniques.
2. Factor affecting reliability.
3. Limitations.
4. Fault Tree Analysis.

Syllabus

Unit-I

Reliability Engineering: An overview. Historical development, Reliability: A birth-to-death problem. Reliability: An interdisciplinary effort. Reliability education and research, Problems of developing countries, Reliability prediction and analysis, Problems in prediction and analysis. Challenges for future. Scope of the book.

Reliability Mathematics. Classical set theory. Boolean algebra. Sample space. Definitions of probability. Basic properties of probability. Independent events. Conditional probability. Multiplication theorem. Total probability theorem. Bayes' theorem. Random variables. Probability distributions. Cumulative distributions. Mathematical expectation. Variance. Covariance and correlation. Moments. Moment generating functions. Probability distributions. Joint probability distributions. Distributions of several random variables. Some useful limit

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theorems. Estimation theory. Laplace transform. Markov processes. Random number generation.

Unit-II

Reliability Data Analysis and Management. The reliability function. Mean time to failure. Variance. The bathtub curve. Linear hazard models. Other hazard models. Analysis of failure data. Probability graph papers. Illustrations. Hazard function plots. Selection of a distribution. Statistical estimation of failure data. Interval estimates. Reliability data management.

Unit - III

Reliability Prediction from Stress-Strength Models. Stresses due to internal and external environments. Physics of failures. Reliability from stress-strength distributions. Reliability from similar stress-strength distributions. Reliability from dissimilar stress-strength distributions. Graphical approach. Time dependent stress-strength models. Environmental factors. Environmental testing; Test specifications. Stress derating. Estimation of part failure rate.

System Reliability Modeling. System modeling. Assumptions for modeling. Two state modeling. Three-state models.

Unit – IV

Reliability Evaluation Techniques. Non path sets or cut sets approaches. Tie set and cut set approaches. Reliability evaluation of flow networks, Path sets/cut sets enumeration.

Maintainability Analysis Measures of system performance. State space approach. Network approach. Conditional probability approach. Three state systems. Preventive maintenance. Condition-based maintenance.

Unit-V

System Analysis Through Fault Trees. Important definitions. Event oriented analysis. Fault tree definitions and symbols. Structure function and coherence. Fault tree construction. Fault tree simplification. Fault tree evaluation. Importance measures of events. Measures of importance in multistate systems. Modularization in fault trees. Common cause/dependent failure analysis. Automatic synthesis of fault trees. Computer codes for fault tree analysis.

References:

1. *Reliability Analysis and Prediction, Volume 1, 1st Edition by K.B. Misra*
2. *Reliability Engineering and Life Testing by Naikan*
3. *Practical Reliability Engineering by Patrick D. T. O'Connor*

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE241	**DES**	**Decision Modelling**	2	1	0	3	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

To introduction with (A) the Problem Solving Process and the Analytic Modeling Process, (B) Descriptive Assessment criteria and weights, Values and Normative Choice, (C) Choice under Uncertainty.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Formulate quantitative business models for real business problems;
2. Develop and apply linear programming models to a variety of business problems using the graphical solution technique;
3. Student will be able to understand the Analytic Modeling Process.
4. Student will be able to solve problem based on Descriptive Assessment criteria and weights
5. Student will be able to analyze problem based on uncertainty.

Syllabus

UNIT 1

The Problem Solving Process: Overview of Problem solving, the problem solving process in policy management, Problem identification: the elements of decision making, actors and decision makers, Attributes, Criterion, Objective and Goal, Actions and Decision variables, Problem Definition (Evaluation measure, measurement scale, binary preference relations), Problem solution: Preference aggregation, Dominant and efficient alternative, preference graph, Sensitivity analysis.

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UNIT 2

The Analytic Modeling Process: Introduction to analytic modeling process, Model verification and validation,. The as abstraction of reality, the analytic modeling process, structure model: definition and elements, action, criteria. Formal models: general aspects, descriptive vs normative preference elicitation, Resolution Models: general resolution approach, resolution complexity.

UNIT 3

Descriptive Assessment criteria and weights: Introduction to Descriptive Assessment criteria and weights. Relative intensity and weights: consistent assessment, Relative importance and ratio scale. Hierarchical decomposition of criteria: structural model and formal model. Aggregation of criteria : differentiation power of criteria and computational aspects.

UNIT 4

Values and Normative Choice: Introduction, The structural model: conceptual aspect. Formal model of value theory: motivation and axioms of value theory, preferential independence, additive value functions, linear value functions, value function over time streams, Interpretation of 2 value functions. The Resolution Models: general approach, assessment of mutual preferential independence, elicitation of 2 dimensional value functions and component value functions.

UNIT 5

Choice under Uncertainty: Introduction, decision making under complete uncertainty: structural model, formal model (Wald's MaxMin rule, Savage's MinMax regrets rule, Hurwicz's Optimism-Pessimism Index), Resolution model. Decision making under risk: structural model, formal model; concept of probability theory. Decision rules: Individual risk, collective risk etc.

Text Books

1. Barbara von Halle, Larry Goldberg: The Decision Model: A Business Logic Framework Linking Business and Technology; CRS press.
2. James R. Evans: Statistics, Data Analysis, and Decision Modeling; Pearson Central Publication.
3. Cliff Ragsdale :Spreadsheet Modeling and Decision Analysis: A Practical Introduction to Business Analytics, ISBN: 978-1285418681
4. Stephen G. Powell and Kenneth R. Baker: The Art of Modeling with Spreadsheets

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE202	**DC**	**Operations Research Techniques**	2	0	2	3	60	20	20	30	20

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs)

Describe various theories of organizations, their characteristics, strengths, and weaknesses. (A) Identify what differentiates various types of organizations. (B) Analyze how organizations come to be the way they are, including the factors, pressures, and historical influences that shape them. (C) Describe the basic language and concepts of the modern organization.

Course Outcomes (COs)

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

1. Collaborative project experiences involving both written and oral presentations.
2. Courses with significant experiential learning components.
3. Experiences with identifying, accessing, evaluating, and interpreting information and data in support of assignments, projects, or research.
4. Course experiences with large-scale datasets.

Syllabus

Unit-I

Introduction History and development of Operations Research, Scientific Methods, Characteristics, Scope, Models in Operations Research. Linear Programming: Formulation, graphical methods, simplex method, Big- M- method

Unit-II

Linear programming models Assignment Models: Definition, Mathematical Representation, Formulation and Solution, Alternate optimal solution Transportation Model: Definition, Formulation and solution, Alternate optimal solution, Stepping stone method, Modified distribution (MODI) or u-v method Sequencing Models: Processing n jobs through two

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machines, m machines, and processing two jobs through m machines, Traveling salesman problem, and minimal path problem.

Unit-III

Waiting Line and Dynamic programming Model Models: Introduction, classification, state in queue, probability distribution of arrival and service times. Single server model (M/M/I). Multiple server model (MMS), Birth and death process. Dynamic Programming: Introduction, Distribution characteristic, dynamic programming approach, optimal subdivision problem.

Unit-IV

Game Theory and Simulation Theory of Game, Competitive game, two persons, zero sum games, maxim in and minimax Principles. Saddle point. Method of Dominance, graphical and algebraic method of solution by transforming into linear programming problem. Bidding problem. Building a simulation model, Monte-Carlo simulation and application.

Unit-V

Network Analysis Network diagram, Time estimation, Basic steps in PERT and CPM, PERT computation, CPM computation, critical path, Float, Cost analysis, crashing the network.

References

1. *Wayne L. Winston, Practical Management Science: spreadsheet modeling and applications*
2. *Tasha, Hamady, Operations Research, 7th edition, (USA: Macmillan Publishing Company), 2003*
3. *Perm Kumar Gupta, Dr. D.S Hira, Operations Research S.Chand publication.*
4. *Tasha, Operations Research, Tata Mc.Graw Hill.2002*
5. *Wagner, Operations Research, PHI. New Delhi, 2003*
6. *Ravi dram & Philips, Operations Research, Tata Mc.Graw Hill.2005*
7. *Gupta & Hira, Operations Research, S. Chand. 1e, 2008*
8. *Vohra N.D, Kataria S.K, Quantitative Techniques for Management. Tata Mc.Graw Hill, 2004*

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE203	**DC**	**Advanced Manufacturing Techniques and System**	2	0	2	3	60	20	20	30	20

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks

Course Objectives: -

This course provides concepts of advanced manufacturing processes like rapid prototype process, metal forming techniques, metal machining techniques along with conventional manufacturing processes.

Course Outcomes: -

After successfully completing this course, you should be able to:

1. Demonstrate an appropriate degree of competency in the evaluation of rapid manufacturing technologies and their application in modern manufacturing processes.
2. Impart through knowledge in various advanced manufacturing processes.
3. Acquaint with the principles, basic machine tools, and developments in the advanced manufacturing process and research trends in the area of advanced manufacturing process.
4. Make use of the above techniques while modelling and solving the engineering problems of different fields.
4. Use advanced forming and machining process as per requirement and done research work on any of the process.

SYLLABUS

UNIT – 01 INTRODUCTION-

Introduction of Conventional manufacturing Processes such as: Casting, Extrusion, Powder Metallurgy, Forging, Rolling, rod/wire drawing and tube drawing etc. Fundamentals of machining, machining processes i.e. Lathe, Milling, Drilling, Shaper, CNC etc.
Introduction of Advanced machining processes, intelligent manufacturing and micro manufacturing.

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UNIT – 02 ADVANCED MACHINING PROCESSES-

Principle, working, limitations and applications of processes such as: Ultrasonic machining (USM), Abrasive jet machining (AJM), Water jet machining (WJM), Abrasive water jet machining (AWJM), Electrochemical machining (ECM), Electro-discharge machining (EDM), Electron beam machining (EBM), Laser beam machining (LBM)

UNIT – 03 ADVANCED FORMING PROCESSE-1-

Advanced Metal Forming Processes
Details of high energy rate forming (HERF) process, Electro-magnetic forming, explosive forming, Electro-hydraulic forming, Stretch forming, Contour roll forming

UNIT – 04 ADVANCED FORMING PROCESSES-2-

Advanced Casting Processes
Metal mould casting, Continuous casting, Squeeze casting, vacuum mould casting, Evaporative pattern casting, ceramic shell casting.

Advanced Welding Processes
Detail s of electron beam welding (EBW), Laser beam welding (LBW), Ultrasonic welding (USW)

UNIT – 05 RAPID PROTOTYPING-

Working Principles, Methods, Stereo Lithography, Laser Sintering, Fused Deposition Method, Applications and Limitations, Rapid tooling, Techniques of rapid manufacturing

EVALUATION

Evaluation will be continuous and it will be integral part of class assessment as well as expert assessment.

Text Books:

- Advanced Machining Processes / V.K.Jain / Allied Publications.
- Introduction to Manufacturing Processes / John A Schey I Mc Graw Hill.
- "Material s and Processes in Manufacturing" (8th Edition),E. P. DeGarmo, J. T Black, R. A. Kohser, Prentice Hall of India, New Delhi (ISBN 0-02-978760).
- "Manufacturing Science" A. Ghosh, and A. K. Mallik, Affiliated East - West Press Pvt. Ltd. New Delhi.
- "Nontraditional Manufacturing Processes", G. F. Benedict, Marcel Dekker, Inc. New York (ISBN 0-8247-7352-7).

Reference Books:

- Intelligent Manufacturing Systems/ Andrew Kusiak/Prentice Hall.

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- Automation, production systems and computer integrated manufacturing/ Mikell.P Groover/PHI/3rd edition/2012
- Rapid Prototyping, M. Adithan, Atlantic Publishers & Distributors (P) Ltd, SBN: 9788126920549, 8126920548
- Engineering Design and Rapid Prototyping, Ali K. Kamrani & Emad Abouel Nasr, Springer
- Manufacturing Engineering and Technology I Kalpakijian / Adisson Wesley, 1995.
- Process and Materials of Manufacturing / R. A. Lindburg / 1th edition, PHI 1990.

List of Experiments

1. Study of advanced casting process & Welding Process.
2. Casting and analysis of L and T Junction in Metal casting process on different material. (by CAD)
3. Analysis of L and T joint in welding process. (by CAD)
4. Analysis of forging process with the help of any CAD tool.
5. Study of RP techniques.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE204	**DC**	**Logistics and Supply Chain Management**	3	0	0	3	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Objective: This course introduces the concept of supply chain management and logistics, models for planning inventory and transportation, models for managing uncertainty, management of logistics across different companies, and applications of supply chain management in different kinds of industries. This course provides an integrated view of purchasing, production, distribution and logistics function.

Course Educational Objectives (CEOs):

To introduction with (A) supply chain management, (B) supply chain integration, (C) Inventory Management and Risk Pooling, (D) Supply Chain Network Configuration.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes -

1. Students would be able to understand the need supply chain management, and its importance, need and key issues.
2. Students would be able to analyses basics supply chain integration systems.
3. Students would be able to understand inventory management and risk pooling in supply chain.
4. Students will be able to understand the forecasting in supply chain.
5. Student would be able to recognize methodology of aggregate planning in supply chain.
6. Students would be able to demonstrate various case studies based on Logistics and Supply Chain Network Configuration.

Syllabus

Unit - I

Introduction to Supply Chain Management

What is supply chain management, key issues in supply chain management, the importance of supply chain decisions, supply chain performance: achieving strategic fit. drivers of supply chain

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE204	**DC**	**Logistics and Supply Chain Management**	3	0	0	3	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
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4. Students will be able to understand the forecasting in supply chain.
5. Student would be able to recognize methodology of aggregate planning in supply chain.
6. Students would be able to demonstrate various case studies based on Logistics and Supply Chain Network Configuration.

Syllabus

Unit - I

Introduction to Supply Chain Management

What is supply chain management, key issues in supply chain management, the importance of supply chain decisions, supply chain performance: achieving strategic fit. drivers of supply chain

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performance, framework for structuring drivers, coordination in supply chain, information technology in supply chain.

Unit - II

Supply Chain Integration

Push, pull and push-pull systems, the impact of the internet on supply chain strategies, distribution strategies, direct shipment, cross-docking transshipment, centralized versus decentralized control, central versus local facilities. International issues in supply chain management: global market forces, technological forces, global cost forces, political and economic forces, risks and advantages of international supply chains, issues in global supply chain management.

Unit – III

Supply Chain Inventory Management and Risk Pooling

Single warehouse inventory, the economic lot size model, the effect of demand uncertainty, supply contracts, multiple order opportunities, continuous review policy, variable lead times, periodic review policy, risk pooling, centralized versus decentralized systems, forecasting techniques. The value of information: the bullwhip effect, quantifying the bullwhip effect, methods for coping with the bullwhip effect, information and supply chain trade-offs

Unit – IV

Planning Demand and Supply in a Supply Chain

Demand forecasting in supply chain, forecast characteristics, components of forecast and various forecasting methods. Aggregate planning in a supply chain, aggregate planning strategies, role of IT in aggregate planning.

Unit-V

Logistics and Supply Chain Network Configuration

Data collection, data aggregation, transportation rates, mileage estimation, warehouse costs, warehouse capacities, potential warehouse locations, service level requirements, future demand, model and data validation, solution techniques.

References

1. David Simchi-Levi, Philip Kaminsky and Edith Simchi-Levi(2004).**Designing and Managing the Supply Chain.** New Delhi: Tata McGraw Hill
2. Donald Walters. Palgrave (2003). **Logistics: An Introduction to Supply Chain Management.** New York: Macmillan
3. David A Taylor (2004). **Supply Chains: A Manager's Guide.** Delhi: Pearson Education.
4. G Raghuram and N Rangaraj(2000.). **Logistics and Supply Chain Management.** Delhi: Macmillan India.

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5. Robert B Handfield and Ernest L Nicholas, Jr.(2004). **Supply Chain Redesign**. Delhi: Pearson
Education.
6. Ronald H Ballou(2004). **Business Logistics/ Supply Chain Management.** Delhi: Pearson Education.
7. Sunil Chopra and Peter Meindl. **Supply Chain Management.** Delhi: Pearson Education

Further Necessities – Case studies of various supply chain models adopted by various industries and industry visit.

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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MTIE205	**DC**	**Financial Management**	3	0	0	3	60	20	20	0	0

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

To introduction with (A) Financial Management Concept, (B) Book keeping, Accounting, Financial Analysis, (C) Financial Planning and Forecasting, Capital Budgeting.

Course Outcomes (COs):

After completion of this course the students are expected to be able to demonstrate following knowledge, skills and attitudes

1. Student will gain knowledge of principles and concepts used in financial decision making.
2. Student will be able to find out the best course of action among several financial options.
3. Familiar with the financial environment of business, especially the financial markets.
4. Student will be able to understand tools and techniques with the situation of Financial Management and its decision.
5. Student will be able to understand basics if Capital Budgeting.

Syllabus

UNIT 1

Financial Management – An Overview of Finance and Related Disciplines; Nature and Scope of Financial Management; Role of financial management in business decisions ; Objectives of Financial Management; Primary Objective of Corporate Management; Agency Problem; Evolution of corporate finance; broader applicability of financial management concepts ; tasks of finance controller. Organization of Finance Function; and Emerging role of Finance Managers in India.

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UNIT-2

Book Keeping and Accounting – Introducing Book Keeping and Record Maintenance; Accounting Mechanics, Process and System; The concept of double entry and fundamental principles; Introduction & working knowledge of different books of account. Preparation of Financial Statements of the firm. Significant Accounting Policies, Accounting Standards.

UNIT 3

Financial Analysis – Ratio analysis (liquidity ratios, profitability ratios, turnover ratios, structural ratios, etc.) ; Funds flow analysis (sources and use of funds, balance sheet and profit and loss statements, measurement of cash flows etc.) ; profit relationship; break even analysis; analysis of operating and financial leverages ; long term and short term cost output relationship.

UNIT 4

Financial Planning and Forecasting–An Overview of Financial forecasting and its techniques ; Sales forecast; Investment decisions criterion ; dividend policy ; cost of capital problems of financial planning and budgeting in public sector undertaking. Dividend and Valuation; Conceptual Framework of Risk and Return: Type of Risks; Risk and Return.

UNIT 5

Capital Budgeting – Principles and Techniques; Nature of Capital Budgeting; Capital rationing ;Data Requirement; Identifying Relevant Cash Flows; Sources of rising fixed and working capital; Evaluation Techniques; and Capital Budgeting Practices in India; Management of working capital ; Internal financing ; Balanced capital structure; Additional Aspects Net Return Value; Internal Rate of Return; Profitability Index Methods.

Text Books

1. Khan, M.Y & Jain, P.K.: Financial Management; Tata McGraw Hill, New Delhi, 2008.
2. Pandey, I. M.: Financial Management; Vikas Publishing House, New Delhi, 2005.
3. Chandra, Prasana: Financial Management; Tata McGraw Hill, New Delhi, 2008.
4. Kuchhal, S.C.: Financial management; Tata McGraw Hill, 2003.
5. Brealey and Meyers: Principles of Corporate Finance: Tata McGraw Hill, New Delhi, 2008.
6. Keown, Martin, Petty and Scott (Jr): Financial Management: Principles and Applications; Prentice Hall of India, New Delhi, 2002.
7. Gitman, L.J: Principles of Managerial Finance; Addison Wasley, 2009.
8. Vanhorne, James C: Financial Management and Policy; Prentice Hall of India, New Delhi, 2002.

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SUBJECT CODE	Category	SUBJECT NAME	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHER ASSESSTMENT*	END SEM UNIVERSITY EXAM	TEACHER ASSESSTMENT*				
MTIE206	DS	CAD/CAM LAB	0	0	0	30	20	0	0	4	2

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; C - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 20 marks.

Course Educational Objectives (CEOs):

To understand (A)the current available CAD/CAM hardware, software and fundamentals(B)To learn new design optimization techniques and newer techniques in CAD/CAM(C)Students will gain a basic understanding of computer numerical control (CNC) machining processes and operations using a combination of G-codes, milling and turning machines.

Course Outcomes (COs):

1. Use CAD software to generate a computer model and technical drawing for a simple, well-defined part or assembly.
2. Generate and interpret engineering technical drawings of parts and assemblies according to engineering design standards.
3. To demonstrate a basic understanding of machining fundamentals including speed and feed calculations, tooling systems, and work-holding systems for CNC milling and turning equipment.
4. To demonstrate a basic and advanced understanding of numerical controlled (NC) programming strategies.
5. To demonstrate ability to set-up, program, and operate CNC milling and turning equipment. To demonstrate an ability to generate NC code using G-codes to machine parts to specifications.

Syllabus

Unit - I

Introduction to CIM: CIM definition and CIM wheel, evolution and benefits; CIM as a subset of Product Life Cycle (PLC) management; design for manufacturing (DFM) and concurrent engineering product design in conventional and CIM environment; terms like CAD, CAE, CAM, CAP, CAPP, CATD and CAQ.

Unit - II

Geometric Modeling in CAD: Wireframe models, parametric representation of Analytical and Synthetic Curves. Surface Models: Parametric Representation of Analytical and Synthetic Surfaces. 2D transformation translation, rotation and scaling with numerical examples, Solid

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Modeling: Boundary Representation, Constructive Solid Geometry, Parametric and Variation modeling, Feature Based Modeling,

Unit – III

CAM: concept and definition, NC (Numerical Control), Concepts and Types, Position and motion control, Constructional features of NC machines, CNC (Computerized Numerical Control) and DNC (Direct Numerical Control) - concept, features and differences. Advantages and limitations of CNC, Selection criteria for CNC machines. CNC machines: Types, classification, working and constructional features. Spindle drives and axes drives on CNC machines. Machine structure- Requirements and reasons. Elements of CNC machines - Types, working and importance of: Slide ways, Re-circulating ball screw, Feedback devices (transducers, encoders), Automatic tool changer (ATC), Automatic pallet changer (APC), CNC axes and motion nomenclature Machine Center, Adaptive Control.

Unit - IV

Part Programming of CNC Machines, G code and M code, MIRAC and TRIAC. Machine axis definition, Programming words EIA codes. CNC canned cycles G71, G72, G73, G74, G90, G92, and G94 for CNC lathe. Absolute and Incremental Programming. Canned cycles of CNC milling machine

Unit-V

Group Technology: Concept, Part family formation, Part Classification and Coding Systems types, OPITZ system, Production Flow Analysis, Composite Part Manufacturing and Machine Cell formation

Flexible Manufacturing Systems: Concept, Components and Types. Automated Storage and Retrieval Systems, AGVs and their types, Adoption Strategies of FMS, Flexibility Analysis. FMS Scheduling.

Reference Books:

1. *"CNC Machines", by Pablo B.S., Adithan M New Age International, New Delhi, 2014*
2. *"Production System & CIM", by Grover, M. P., Zimmer, W.E computer aided design and manufacturing". Prentice Hall, 2011.*
3. *"CAD / CAM problem & practice", by Zeid I, 3rd Edition, Tata McGraw Hill, 2001*
4. *"CAD/CAM principles &applications", by Rao P.N, Tata Mc Graw Hill, 2002.*
5. *"Principles of computer integrated manufacturing", by S. Kant Vajpayee,PHI,2006*

List of Experiments:

1. Experiments and problem based on theory topics.
2. Study of CAD Hardware system using physical and visual aid.
3. Solid modeling using parametric software.
4. Surface modeling using parametric software.

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5. Sheet Metal modeling using parametric software.
6. Assembly modeling using parametric software.
7. Demonstration of CNC machine for identifying machine zero, drive systems, safety precautions.
8. Write CNC part programming of a given component.
9. CNC Programming for CNC lathe Mirac.
10. CNC Programming for CNC milling Triac.
11. Material job handling using Robot system and conveyor assembly.
12. FMS Configuration, Programming and Simulation.

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