

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI.



**Scheme of Teaching and Examinations and Syllabus
M.Tech Master of Engineering Management (MEM)
(Effective from Academic year 2020 - 21)**

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI											
Scheme of Teaching and Examinations – 2020 - 21											
M.Tech Master of Engineering Management (MEM)											
Choice Based Credit System (CBCS) and Outcome Based Education (OBE)											
I SEMESTER											
Sl. No	Course	Course Code	Course Title	Teaching Hours per Week			Examination			Credits	
				Theory	Practical	Skill Development Activities	Duration in hours	CIE Marks	SEE Marks		Total Marks
				L	P	SDA					
1	PCC	20MEM11	Mathematical Methods In Engineering	03	--	02	03	40	60	100	4
2	PCC	20MEM12	Marketing Management	03	--	02	03	40	60	100	4
3	PCC	20MEM13	Quantitative Techniques in Decision Making	03	--	02	03	40	60	100	4
4	PCC	20MEM14	Organizational Behaviour	03	--	02	03	40	60	100	4
5	PCC	20MEM15	Managerial Economics	03	--	02	03	40	60	100	4
6	PCC	20MEML16	Management Tools Lab	--	04	--	03	40	60	100	2
7	PCC	20RMI17	Research Methodology and IPR	01	--	02	03	40	60	100	2
TOTAL				17	04	12	21	280	420	700	24
Note: PCC: Professional core.											
Skill development activities:											
Students and course instructor/s to involve either individually or in groups to interact together to enhance the learning and applications skills.											
The students should interact with industry (small, medium and large), understand their problems or foresee what can be undertaken for study in the form of research/ testing / projects, and for creative and innovative methods to solve the identified problem.											
The students shall											
(1) Gain confidence in modelling of systems and algorithms.											
(2) Work on different software/s (tools) to Simulate, analyse and authenticate the output to interpret and conclude. Operate the simulated system under changed parameter conditions to study the system with respect to thermal study, transient and steady state operations, etc.											
(3) Handle advanced instruments to enhance technical talent.											
(4) Involve in case studies and field visits/ fieldwork.											
(5) Accustom with the use of standards/codes etc., to narrow the gap between academia and industry.											
All activities should enhance student's abilities to employment and/or self-employment opportunities, management skills, Statistical analysis, fiscal expertise, etc.											
Internship: All the students have to undergo mandatory internship of 6 weeks during the vacation of I and II semesters and /or II and III semesters. A University examination shall be conducted during III semester and the prescribed internship credit shall be counted for the same semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared as fail in internship course and have to complete the same during the subsequent University examination after satisfying the internship requirements.											
Note: (i) Four credit courses are designed for 50 hours Teaching – Learning process.											
(ii) Three credit courses are designed for 40 hours Teaching – Learning process.											
(iii) Two credit courses are designed for 25 hours Teaching – Learning process.											

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II SEMESTER											
Sl. No	Course	Course Code	Course Title	Teaching Hours /Week			Examination			Credits	
				Theory	Practical/ Seminar	Skill Development Activities	Duration in hours	CIE Marks	SEE Marks		Total Marks
				L	P	SDA					
1	PCC	20MEM21	Project Management	03	--	02	03	40	60	100	4
2	PCC	20MEM22	Human Resources Management	03	--	02	03	40	60	100	4
3	PCC	20MEM23	Supply Chain Management	03	--	02	03	40	60	100	4
4	PEC	20MEM24X	Professional Elective-1	04	--	--	03	40	60	100	4
5	PEC	20MEM25X	Professional Elective -2	04	--	--	03	40	60	100	4
6	PCC	20MEML26	Statistical Tools Lab	--	04	--	03	40	60	100	2
7	PCC	20MEM27	Technical Seminar	--	02	--	--	100	--	100	2
TOTAL				17	06	06	18	340	360	700	24
Note: PCC: Professional core, PEC: Professional Elective.											
Professional Elective 1						Professional Elective 2					
Course Code under20MEM24X			Course title			Course Code under20MEM25X			Course title		
20MEM241			Operations Management			20MEM251			Simulation Modelling and		
20MEM242			Advertising and Publicity			20MEM252			Product Life Cycle Management		
20MEM243			Knowledge Management			20MEM253			Robust Design		
20MEM244			Composite Materials			20MEM254			Industrial Robotics		
Note:											
1. Technical Seminar: CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide, if any, and a senior faculty of the department. Participation in the seminar by all postgraduate students of the programme shall be mandatory. The CIE marks awarded for Technical Seminar, shall be based on the evaluation of Seminar Report, Presentation skill and performance in Question and Answer session in the ratio50:25:25.											
2. Internship: All the students shall have to undergo mandatory internship of 6 weeks during the vacation of I and II semesters and /or II and III semesters. A University examination shall be conducted during III semester and the prescribed internship credit shall be counted in the same semester. Internship shall be considered as a head of passing andshallbeconsideredfortheawardofdegree.Those,whodonottake-up/completetheinternshipshallbedeclaredas											

fail in internship course and have to complete the same during the subsequent University examination after satisfying the internship requirements.

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III SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week			Examination			Credits	
				Theory	Practical/ Mini-Project/ Internship	Skill Development activities	Duration in hours	CIE Marks	SEE Marks		Total Marks
				L	P	SDA					
1	PCC	20MEM31	Modern Trends in Management	03	--	02	03	40	60	100	4
2	PEC	20MEM32X	Professional elective 3	03	--	--	03	40	60	100	3
3	PEC	20MEM33X	Professional elective 4	03	--	--	03	40	60	100	3
4	Project	20MEM34	Project Work phase -1	--	02	--	--	100	--	100	2
5	PCC	20MEM35	Mini-Project	--	02	--	--	100	--	100	2
6	Internship	20MEMI36	Internship	(Completed during the intervening vacation of I and II semesters and /or II and III semesters.)			03	40	60	100	6
TOTAL				09	04	02	12	360	240	600	20

Note: PCC: Professional core, PEC: Professional Elective.

Professional elective 3		Professional elective 4	
Course Code under	Course title	Course Code under	Course title
20MEM321	Industrial Marketing	20MEM331	Product Design and Development
20MEM322	Quality and Reliability Engineering	20MEM332	Product Data Management
20MEM323	Industrial Design and Ergonomics	20MEM333	Product Planning and Marketing
20MEM324	Advanced Fluid Power Systems	20MEM334	Agile Manufacturing

Note:

1. Project Work Phase-1: Students in consultation with the guide/co-guide if any, shall pursue literature survey and complete the preliminary requirements of selected Project work. Each student shall prepare relevant introductory project document, and present a seminar.

CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide if any, and a senior faculty of the department. The CIE marks awarded for project work phase -1, shall be based on the evaluation of Project

Report, Project Presentation skill and performance in Question and Answer session in the ratio 50:25:25.
SEE (University examination) shall be as per the University norms.

2. Internship: Those, who have not pursued /completed the internship shall be declared as fail in internship course and have to complete the same during subsequent University examinations after satisfying the internship requirements.
Internship SEE (University examination) shall be as per the University norms.

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IV SEMESTER

Sl. No	Course	Course Code	Course Title	Teaching Hours /Week		Examination				Credits
				Theory	Practical/ Field work	Duration in hours	CIE Marks	SEE Marks Viva voce	Total Marks	
				L	P					
1	Project	20MEM41	Project work phase -2	--	04	03	40	60	100	20
TOTAL				--	04	03	40	60	100	20

Note:

1. Project Work Phase-2:

CIE marks shall be awarded by a committee comprising of HoD as Chairman, Guide/co-guide, if any, and a Senior faculty of the department. The CIE marks awarded for project work phase -2, shall be based on the evaluation of Project Report subjected to plagiarism check, Project Presentation skill and performance in Question and Answer session in the ratio 50:25:25.

SEE shall be at the end of IV semester. Project work evaluation and Viva-Voce examination (SEE), after satisfying the plagiarism check, shall be as per the University norms.



MATHEMATICAL METHODS IN ENGG. (common to MPT, MPE, MPD, MEM, MPM, MPY, & MSE)			
Course Code	20MEM11	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
Errors and Simple Mathematical modeling: Error definition, roundoff errors and truncation errors. Mathematical modeling and Engineering problem solving: Simple mathematical model, Conservation Laws of Engineering. Engineering Applications on : i) Deflection of Beams ii) Whirling of shafts iii) Terminal velocity of a freely falling body (RBT Levels: L1 & L2) (Text Book:1) 10Hrs			
Module-2			
System of Linear Algebraic Equations And Eigen Value Problems: Gauss-Jordan Method, Cholesky Method, Partition method, Givens method for symmetric matrices, (RBT Levels: L1 & L2) (Text Book:3) 10Hrs			
Module-3			
Roots of Equations: Muller's method , Graeffe's roots squaring method. Numerical solutions of ordinary differential equations: Introduction, Picard's method of successive approximation, first order simultaneous equations by Picard's & Runge Kutta methods. & second order equations by Picard's & Runge Kutta methods. (RBT Levels: L2 & L3) (Text Book:3) 10Hrs			
Module-4			
Partial Differential Equations: Numerical solution of one dimensional wave equation, Heat equation,(Schmidt's explicit formula)& Laplace equation(Gauss-Seidel process) by finite difference schemes. Illustrative examples on each method, (RBT Levels: L2 & L3) (Text Book:2). 10Hrs			
Module-5			
Sampling theory: Testing of hypothesis: Chi square test and F-test. Analysis of Variance (ANOVA): one way classification, Design of experiments, RBD. (RBT Levels: L2 & L3) (Ref. Book:1). 10Hrs			
Course Outcomes: On completion of this course, students are able to: 1. Acquire the idea of significant figures, types of errors during numerical computation. 2. Understand statistical and probabilistic concepts required to test the hypothesis and designing the experiments using RBD. 3. Learn various numerical methods to solve system of linear equations. 4. Understand the roots of algebraic/transcendental equations and solve PDE's numerically. 5. Analyze and solve PDE's related to wave equation arising in vibration analysis.			

<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from eachmodule.
<p>Textbooks</p>
<p>1. Steven C Chapra and Raymond P Canale, “Numerical Methods for Engineers,” 7th Ed., cGraw-Hill Edition, 2015</p>
<p>2. Theory of ordinary differential equations, Coddington E., Levinson N., McGraw-Hill publishing Company, TMH Edition, 9th Reprint, 1987..</p>
<p>3. M K Jain, S.R.K Iyengar, R K. Jain, Numerical methods for Scientific and engg computation, New Age International, 2003.</p>
<p>Reference books:</p>
<p>1.R.E, Walpole, R.H.Myres, S.L.Myres and Keying Ye, “Probability and Statistics for Engineers and Scientists”, 9th Edition, Pearson, 2012</p>
<p>2.Dr. B.S. Grewal, “Numerical Methods in Engineering and Science”, Khanna Publishers, 1999.</p>
<p>3.K Shankar Rao, “Introduction to Partial Differential Equations” Prentice - Hall of India Pvt. Lt. , 1995 Edition</p>
<p>4. C. Ray Wylie and Louis C Barrett, “Advanced Engineering Mathematics”. 6th edition, McGraw-Hill, 1995.</p>

MARKETING MANAGEMENT			
Course Code	20MEM12	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
Introduction: Role of marketing in today's organizations – core concepts of marketing – management – the evolution of marketing management concept.			
Marketing Environment – Marketing system – actors in the company's Micro and Macro Environment. 10HRs			
Module-2			
Consumer Markets and Buying Behaviors – a Model of consumer behavior – Major factors influencing consumer behavior – the buying decision process. 10HRs			
Module-3			
Organizational Markets and Buying Behavior – the industrial market – the reseller market – the government market. 10HRs			
Module-4			
Market Segmentation – Market testing – market positioning – the marketing plan. Concept of Product life cycle and new Product development process. 10HRs			
Module-5			
Pricing Decisions and Channel decisions, Product branding, packing and service, advertisement and media management, Communication and promotion mix decision. 10HRs			
Course outcomes:			
At the end of the course the student will be able to:			
1. Understand the basic concept of MM and marketing environment.			
2. Design of product layout, Consumer Markets and Buying Behaviors.			
3. Applying appropriate Organizational Markets and Buying Behavior.			
4. Market testing – market positioning.			
5. Constructing Pricing Decisions and Channel decisions			
Question paper pattern:			
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.			
<ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. ■ 			
Reference Books			
(1) Marketing Management, Analysis, Planning and Control – Philip Kotler – PHI -1999.			
(2) Marketing Management – Willam J Stanton – John Wiley – Sales Force Chicago, Irwin – 1993.			

QUANTITATIVE TECHNIQUES IN DECISION MAKING			
Course Code	20MEM13	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>Introduction: Statistics and managerial decisions, statistical data and Operations Research techniques. Fundamentals of Statistics, probability and probability distributions: Measures of central tendency and location, Measure of dispersion, skewness and kurtosis, Probability and rules of probability, Random variables and probability distributions – Binomial, Poisson, Hyper geometric and Normal.</p> <p style="text-align: right;">10HRs</p>			
Module-2			
<p>Decision Making under Uncertainty: Alternative criteria for decision under uncertainty, Bayesian approach and Incremental analysis. Linear Programming Problem: Formulation of L.P.P., Solution of L.P.P. by graphical method, Solution of L.P.P. by simplex method, Concept of duality and solution of dual problems, Solution of L.P.P. by dual simplex method and Sensitivity analysis. 10HRs</p>			
Module-3			
<p>Transportation and Assignment Problems: Structure of transportation problem and various methods to find LB.F.S, Optimality test of transportation problems by MODI method, Solution of degeneracy and unbalanced transportation problems, Assignment problems and solution by Hungarian method and Traveling Salesman problem.</p> <p style="text-align: right;">10HRs</p>			
Module-4			
<p>Two person zero sum game, Minimax & maximin strategies, Solution of game by dominance rules, arithmetic and algebraic methods, Solution of game by graphical method and method of matrices.</p> <p style="text-align: right;">10HRs</p>			
Module-5			
<p>Network Analysis: PERT and CPM, Network construction and determination of critical path, Calculation of ES, EF, LS, LF, TF, FF and IF, Crashing of a project, Scheduling of a project and resource leveling. Waiting Line: Basic structure of queuing systems and characteristics, Expressions for M/M/1 queuing model. Simulation of Management systems: Simulation and Monte Carlo method, Waiting line and inventory simulation models.</p> <p style="text-align: right;">10HRs</p>			
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Provide greater insight into decision-making processes, with strong fundamentals. 2. Understand better how people perceive and decide about risk and transform domain situation to LPP and solve it. 3. Formulate as Transportation, Assignment, and Travelling salesman problems and derive Optimum solutions. 4. Formulate game theory problems and obtain solutions using different methods. Understand the fundamentals of Queues. 5. Develop an appropriate network diagram for the given problem and analyse the project using critical path, floats, slacks. Crash the project and obtain minimum cost/time schedule. Develop simulation models using Monte Carlo technique. 			

<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from each module. ■
<p>Textbooks</p>
<p>(1) Quantitative Techniques for managerial decisionsm – SrivastavaU.K. – New Age International Private Limited –ISBN Number:8122401899</p>
<p>(2)Operations Research – H. Taha– Prentice Hall India – 8 Edition.</p>
<p>Reference Books</p>
<p>(1) Operations Research: An Introduction – Gupta and Heera – S.Chand and Company – 2002</p>
<p>(2) Introduction to Operations Research – Hillier and Liberman– McGraw Hill International. – ISBN 10: 0072321695</p>

ORGANIZATIONAL BEHAVIOUR			
Course Code	20MEM14	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
The Foundations of Organizational Behavior: Historical Background, Research Methodology, Theoretical, Frameworks. OBin global context, Role of Information Technology, TQM, Learning Organizations. 10HRs			
Module-2			
Individual Behavior: Biographical Characteristics, Ability, Personality, Learning, Implications for Performance and Satisfaction. Perception and Individual Decision –Making Values, Attitudes and Job Satisfaction. 10HRs			
Module-3			
Basic Motivation Concepts: Work Motivation Approaches – Content and Process Theories of Work Motivation – Contemporary Theories of Work Motivation – Motivation through Job Design, Quality of Work Life, Goal Setting. 10HRs			
Module-4			
Foundations of Group Behavior: Communication and Group Decision Making – Leadership Styles and Skills – Power and Politics – Conflict and Inter –group behavior. 10HRs			
Module-5			
Organization Culture: Organizational Change – Organizational Development Organizational Climate –Work Stress. 10HRs			
Course outcomes: At the end of the course the student will be able to: 1. Define organisational behaviour, analyse discipline and area of application in business. 2. Understand personality, interpersonal and intergroup behaviour. 3. Understand group types, norms and decision making. 4. Understand nature and development of leadership and types of power. 5. Learn the management of conflict, development, effectiveness and cross cultural management			
Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60. <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. 			
Textbooks			
(1) Organizational Behavior – Stephen. P. Robbins – Prentice Hall, India. - 9th edition 2001.			
(2) Organizational Behavior – Fred Luthans – McGraw Hill – 1997			

Reference Books
(1) Human Behavior at work – Keith Davis – Prentice Hall India – 2007.
(2) Organizational Psychology – Robin, Kolb, etc – 1996

MANAGERIAL ECONOMICS			
Course Code	20MEM15	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>Demand Analysis: Demand Theory, Preference and Choice, Empirical Demand Curves, Goods Characteristics Approach.</p> <p>Production & Cost: Production Theory and Estimation: Organization of Production and the Production Function, Production Function with two variable inputs, optimal combination of inputs returns to scale. Empirical production functions. Cost Components – Cost functions, Empirical Cost functions 10HRs</p>			
Module-2			
<p>Market Structures: Perfect Competition: Meaning characteristics and importance, price and output determination in the short run and long run. Derived demand for inputs, shortcomings of perfect competition.</p>			
Module-3			
<p>Monopoly: Meaning, characteristics and importance, comparison with perfect competition, short run and long run analysis evaluation. Monopolistic Competition: Meaning, Characteristics and Importance short run and long run analysis.</p> <p>Oligopoly: Meaning, characteristics and importance, Non-Collusive Oligopoly and the kinked demand curve, Collusive Oligopoly, efficiency implications of oligopoly. 10HRs</p>			
Module-4			
<p>Pricing in Practice: Cost-plus pricing, Evaluation of cost plus pricing, Incremental Analysis in pricing. 10HRs</p>			
Module-5			
<p>Capital Budgeting: Meaning and Importance, Protecting Cash Flows, Present Value and Internal Rate of Return, Comparison of NPV and IRR. Economic Growth, Development and planning economic aggregates and economic relationships. 10HRs</p>			
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand concept like flow of economic activity, profit and demand and price elasticity. 2. Estimate production functions with one and two input variables. 3. Find optimistic cost considering all relevant factors. 4. Compare monopoly and oligopoly competition in market and barriers to enter. 5. Understand pricing on multiple product and employment of input. 			
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. ■ 			
Textbooks			

(1) Economics: Principles, Problems and Policies – Campbell R. McConnell – McGraw Hill – 2005
(2) Theory and Problems of Micro Economic Theory – Dominic Salvator, McGraw Hill – 1991
Reference Books
(1) Managerial Economics – Joel Dean – PHI – 2005.
(2) Managerial Economics – Dominic Salvator, McGraw Hill – 1995.

MANAGEMENT TOOLS LAB			
Course Code	20MEML16	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	0:4:0	SEE Marks	60
Credits	02	Exam Hours	03
Sl. NO	Experiments		
1	Introduction to OR Packages		
2	Building Linear Programming Models (Formulation of LPP) and performing sensitivity analysis.		
3	Building Transportation Models		
4	Exercise on Assignment and Traveling salesman problems		
5	Building network models Construction of PERT/CPM networks CPM –Determination of critical path, Time duration and floats PERT –Determination of project duration and variance		
6	Building simulation model for Inventory Layout Banking transactions Simple manufacturing system		
Suggested Software Packages: LINDO / Quantitative System Analysis (QSA)/ TORA software / M.S. Projects/ARENA			
Question paper pattern: The SEE questions will be set for 100 marks: 1. Two experiments for 80 marks. 2. Viva voce for 20 marks.			
Course outcomes: At the end of the course the student will be able to: 1. Understand the OR packages 2. Understand and Building Transportation Models 3. Understand the PERT/CPM networks. 4. Building different simulation models			

RESEARCH METHODOLOGY AND IPR			
Course Code	20RMI17	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	1:0:2	SEE Marks	60
Credits	02	Exam Hours	03
Module-1			
<p>Research Methodology: Introduction, Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Importance of Knowing How Research is Done, Research Process, Criteria of Good Research, and Problems Encountered by Researchers in India.</p> <p>Defining the Research Problem: Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem, An Illustration.</p>			
Module-2			
<p>Reviewing the literature: Place of the literature review in research, Bringing clarity and focus to your research problem, Improving research methodology, Broadening knowledge base in research area, Enabling contextual findings, How to review the literature, searching the existing literature, reviewing the selected literature, Developing a theoretical framework, Developing a conceptual framework, Writing about the literature reviewed.</p> <p>Research Design: Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs, Important Experimental Designs</p>			
Module-3			
<p>Design of Sampling: Introduction, Sample Design, Sampling and Non-sampling Errors, Sample Survey versus Census Survey, Types of Sampling Designs.</p> <p>Measurement and Scaling: Qualitative and Quantitative Data, Classifications of Measurement Scales, Goodness of Measurement Scales, Sources of Error in Measurement Tools, Scaling, Scale Classification Bases, Scaling Technics, Multidimensional Scaling, Deciding the Scale.</p> <p>Data Collection: Experimental and Surveys, Collection of Primary Data, Collection of Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method.</p>			

Module-4
<p>Testing of Hypotheses: Hypothesis, Basic Concepts Concerning Testing of Hypotheses, Testing of Hypothesis, Test Statistics and Critical Region, Critical Value and Decision Rule, Procedure for Hypothesis Testing, Hypothesis Testing for Mean, Proportion, Variance, for Difference of Two Mean, for Difference of Two Proportions, for Difference of Two Variances, P-Value approach, Power of Test, Limitations of the Tests of Hypothesis.</p> <p>Chi-square Test: Test of Difference of more than Two Proportions, Test of Independence of Attributes, Test of Goodness of Fit, Cautions in Using Chi Square Tests</p>
Module-5
<p>Interpretation and Report Writing: Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation, Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports.</p> <p>Intellectual Property: The Concept, Intellectual Property System in India, Development of TRIPS Complied Regime in India, Patents Act, 1970, Trade Mark Act, 1999, The Designs Act, 2000, The Geographical Indications of Goods (Registration and Protection) Act 1999, Copyright Act, 1957, The Protection of Plant Varieties and Farmers' Rights Act, 2001, The Semi-Conductor Integrated Circuits Layout Design Act, 2000, Trade Secrets, Utility Models, IPR and Biodiversity, The Convention on Biological Diversity (CBD) 1992, Competing Rationales for Protection of IPRs, Leading International Instruments Concerning IPR, World Intellectual Property Organisation (WIPO), WIPO and WTO, Paris Convention for the Protection of Industrial Property, National Treatment, Right of Priority, Common Rules, Patents, Marks, Industrial Designs, Trade Names, Indications of Source, Unfair Competition, Patent Cooperation Treaty (PCT), Advantages of PCT Filing, Berne Convention for the Protection of Literary and Artistic Works, Basic Principles, Duration of Protection, Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement, Covered under TRIPS Agreement, Features of the Agreement, Protection of Intellectual Property under TRIPS, Copyright and Related Rights, Trademarks, Geographical indications, Industrial Designs, Patents, Patentable Subject Matter, Rights Conferred, Exceptions, Term of protection, Conditions on Patent Applicants, Process Patents, Other Use without Authorization of the RightHolder, Layout-Designs of Integrated Circuits, Protection of Undisclosed Information, Enforcement of Intellectual Property Rights, UNSECO.</p>

<p>Course outcomes:</p> <p>At the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Discuss research methodology and the technique of defining a research problem • Explain the functions of the literature review in research, carrying out a literature search, developing theoretical and conceptual frameworks and writing a review. • Explain various research designs, sampling designs, measurement and scaling techniques and also different methods of data collections. • Explain several parametric tests of hypotheses, Chi-square test, art of interpretation and writing research reports • Discuss various forms of the intellectual property, its relevance and business impact in the changing global business environment and leading International Instruments concerning IPR.
<p>Question paper pattern:</p> <ul style="list-style-type: none"> • The question paper will have ten questions. • Each full question is for 20 marks. • There will be 2 full questions (with a maximum of four sub questions in one full question) from each module. • Each full question with sub questions will cover the contents under a module. • Students will have to answer 5 full questions, selecting one full question from each module.
<p>Textbooks</p> <p>(1) Research Methodology: Methods and Techniques, C.R. Kothari, Gaurav Garg, New Age International, 4th Edition, 2018.</p> <p>(2) Research Methodology a step-by-step guide for beginners. (For the topic Reviewing the literature under module 2), Ranjit Kumar, SAGE Publications, 3rd Edition, 2011.</p> <p>(3) Study Material (For the topic Intellectual Property under module 5), Professional Programme Intellectual Property Rights, Law and Practice, The Institute of Company Secretaries of India, Statutory Body Under an Act of Parliament, September 2013.</p>
<p>Reference Books</p> <p>(1) Research Methods: the concise knowledge base, Trochim, Atomic Dog Publishing, 2005.</p> <p>(2) Conducting Research Literature Reviews: From the Internet to Paper, Fink A, Sage Publications, 2009.</p>

*** END OF I SEMESTER ***

PROJECT MANAGEMENT			
Course Code	20MEM21	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>Introduction: Identification of Investment Opportunities, Market and Demand Analysis – Technical Analysis -Investment Outlay..</p> <p style="text-align: right;">10Hrs</p>			
Module-2			
<p>Means of Financing- Profitability and Breakeven Analysis -Cash Flows of Projects -Tax factor in investment Analysis -Interest CompoundingandDiscounting.</p> <p style="text-align: right;">10Hrs</p>			
Module-3			
<p>Appraisal Criteria and Selection of Investment-cost of capital analysis of Risk -Financial Projection, social Cost BenefitAnalysis.</p> <p style="text-align: right;">10Hrs</p>			
Module-4			
<p>Manpower Management in Projects- Functional Approach to Manpower Management, - the Element of decision Process Project Team Concepts - Field Autonomy- Policies Governing Projects.</p> <p style="text-align: right;">10Hrs</p>			
Module-5			
<p>Networks Techniques in Project Management-PERT/CPM Analysis - Administrative aspects of Capital Investment.</p> <p style="text-align: right;">10Hrs</p>			
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the relation between investment opportunities, market, and demandanalyses. 2. Analyse the project cash flow, interest and taxfactor. 3. Understand the cost capital analysis of risk, financial project, social cost and benefitanalysis. 4. Understand the man power management and project teamconcept. 5. Optimise the project management by PERT andCPM. 			
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from eachmodule. 			
Textbooks			

(1)Projects: appraisal, preparation, budgeting & implementation – Prasannachandra - TMH
(2)Handbook of Project Management - Dennis lock.
Reference Books
(1) Project Management - Dennis lock - GowerPublishing Ltd - 8th Revised edition.

HUMAN RESOURCES MANAGEMENT			
Course Code	20MEM22	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>HRM in perspective, competitive challenges, uses of HR information, Demographics and employee concerns, social issues, diversity in HRM,</p> <p>Relationship of Job Requirements and HRM functions, Job Analysis, Job Description, Job Design, Designing work for groups, flexible work schedules, Industrial engineering and ergonomic consideration, HR Planning, Effective HRP, Forecasting and balancing supply and demand of HR, recruiting from inside and outside, Recruiting protected class, Recruiting older people. 10Hrs</p>			
Module-2			
<p>Selection, Matching people and job, sources of information about job candidate, The US Employee Polygraph Protection Act, graphology, Medical examination, Drug test, Interview methods Guidelines for interviewers, appropriate and inappropriate interview questions, selection decision. 10 Hrs</p>			
Module-3			
<p>Developing effectiveness in HR, Investment in Training, System approach, Conducting the .needs assessment, designing training programs, trainee readiness and motivation, principles of learning, characteristics of trainees, training methods for non-managerial employees, OJT, Technology for training, training methods for MDP, Evaluating, benchmarking HR training. 10 Hrs</p>			
Module-4			
<p>Career development and Appraisal, identifying career opportunity and requirements, gauging employee potential, career development initiative, Mentor check list, career development for women and minorities, dual career couples, personal career development, Behavioural methods of appraisal, balanced score card, personal score card appraisal interviews; performance diagnosis. 10Hrs</p>			
Module-5			
<p>International HRM, Managing across borders, International staffing, Skills of a global manager, content of training program. Non-verbal communications, developing local resources, compensation of host country employees, managers and expatriate managers. Case studies on appraisal system, developing a training session, evaluating a given training program. Preparation of structured and unstructured interviews. 10Hrs</p>			

<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the basic concepts of HRM, Functions and role of HRM. 2. Know methodology of job selection process implemented in various sectors. 3. Analyse the effectiveness in training, evaluating and benchmarking HRtraining. 4. Understand the career development concept and methods of personal appraisal. 5. Understand International activities of HRM, Staffing, communication, appraisal training and interviewsystem.
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from eachmodule. ■
<p>Textbooks</p>
<p>(1)Managing Human Resources - Wayne F Cascio - Tata McGraw Hill, New Delhi</p>
<p>(2)Managing Human Resources - George Bohlander and Scot Snell - Thompson South western.</p>
<p>Reference Books</p>
<p>(1)Human Resource Management - BiswajeetPattanayak - Prentice Hall of India Pvt. Ltd.</p>
<p>(2)Human Resource Management - K. Ashwathappa,</p>
<p>(3)Personnel Management - C.B.Memoria - Himalaya Publishing.</p>

SUPPLY CHAIN MANAGEMENT			
Course Code	20MEM23	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>Building a Strategic Frame Work to Analyze Supply Chains: Supply chain stages and decision phases process view of a supply chain. Supply chain flows. Examples of supply chains, Competitive and supply chain strategies. Achieving strategic fit. Expanding strategic scope. Drivers of supply chain performance. Framework for structuring drivers – Inventory, Transportation, Facilities, Information. Obstacles to achieving fit.</p> <p>Designing the Supply Chain Network: Distribution Networking – Role, Design. Supply Chain Network (SCN) – Role, Factors, Framework for Design Decisions. 10HRs</p>			
Module-2			
<p>Facility Location and Network Design: Models for facility location and capacity allocation. Impact of uncertainty on SCN .</p> <p>Planning and Managing Inventories in a Supply Chain: Review of inventory concepts. Trade promotions, managing multi-echelon cycle inventory, safety inventory determination. Impact of supply uncertainty aggregation and replenishment policies on safety inventory. Optimum level of product availability; importance factors. Managerial levers to improve supply chain profitability. 10HRs</p>			
Module-3			
<p>Sourcing, Transportation and Pricing Products: Role of sourcing, supplier – scoring & assessment, selection and contracts. Design collaboration.</p> <p>Sourcing, Transportation and Pricing Products: Role of transportation, Factors affecting transportation decisions. Modes of transportation and their performance characteristics. Designing transportation network. Trade - off in transportation design. Tailored transportation, Routing and scheduling in transportation. International transportation. Analytical problems. Role Revenue Management in the supply chain. 10HRs</p>			
Module-4			
<p>Coordination and Technology in the Supply Chain: Co-ordination in a supply chain: Bullwhip effect. Obstacles to coordination. Managerial levers to achieve co-ordination, Building strategic partnerships. 10HRs</p>			
Module-5			
<p>Coordination and Technology in the Supply Chain: The role of IT supply Chain, The Supply Chain IT framework, CRM, Internal SCM, SRM. The role of E-business in a supply chain, The E-business framework, E-business in practice.</p> <p>Emerging Concepts: Reverse Logistics; Reasons, Activities, Role. RFID Systems; Components, applications, implementation. Lean supply chains, Implementation of Six Sigma in Supply Chains. . 10HRs</p>			

<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. To understand issues & challenges in implementing & developing Building a Strategic Frame Work to Analyze SupplyChains. 2. To understandthe Facility Location and NetworkDesign. 3. Analyze how supply chain techniques can be applied to manufacturing & serviceindustry 4. Developing Coordination and Technology in the Supply Chain management. 5. Analyzing how Emerging Concepts generation fororganization
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from each module. ■
<p>Textbooks</p>
<p>(1) Supply Chain Management– Strategy, Planning & Operation. Sunil Chopra & Peter Meindl; Pearson Education Asia, ISBN: 81-7808-272-1. – 2001</p>
<p>(2) Supply Chain Redesign – Transforming Supply Chains into Integrated Value Systems –Robert B Handfield, Ernest L Nichols - Jr., 2002, Pearson Education Inc, ISBN: 81-297-0113-8</p>
<p>3. Modeling the Supply Chain -Jeremy F Shapiro, Duxbury - Thomson Learning -2002, ISBN 0-534-37363.</p>
<p>Reference Books</p>
<p>(1) Designing & Managing the Supply Chain -David Simchi Levi, Philip Kaminsky& Edith Simchi Levi - McGraw Hill.</p>
<p>(2) Going Backwards Reverse Logistics Trends and Practices -Dr. Dale S. Rogers,Dr. Ronald S. Tibben-Lembke, University of Nevada, Reno, Center for Logistics Management</p>

OPERATIONS MANAGEMENT			
Course Code	20MEM241	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
Operations Planning Concepts: Introduction, Operations Functions in Organizations, Historical development, Framework for managing operations, The trend: Information and Non-manufacturing systems, Operations management, Factors affecting productivity, International dimensions of productivity, The environment of operations, Production systems decisions- a look ahead. Introduction to ERP 10HRs			
Module-2			
Operations Decision Making : Introduction, Management as a science, Characteristics of decisions, Framework for decision making, Decision methodology, Decision Tree Problems, Economic models-Break Analysis in operations, P/V ratio, Statistical models. System Design and Capacity: Introduction, Manufacturing and service systems, Design and systems capacity, Capacity planning. . . . 10HRs			
Module-3			
Forecasting Demand: Forecasting objectives and uses, Forecasting variables, Opinion and Judgmental methods, Time series methods, Moving Average methods, Exponential smoothing, Trend adjusted Exponential Smoothing, Regression and correlation methods 10HRs			
Module-4			
Aggregate Planning and Master Scheduling: Introduction- planning and scheduling, Objectives of aggregate planning, Three Pure Strategies, Aggregate planning methods, Master scheduling objectives, Master scheduling methods.			
Material and Capacity Requirements Planning: Overview: MRP and CRP, MRP: Underlying concepts, System parameters, MRP logic, System refinements, Capacity management, CRP activities.. 10HRs			
Module-5			
Scheduling and Controlling Production Activities: Introduction, PAC, Objectives and Data requirements, Loading –Finite and Infinite Scheduling methodology, priority sequencing, capacity control Single Machine Scheduling: Concept , measures of performance, SPT rule, Weighted SPT rule ,EDD rule. 10HRs			
Course outcomes: At the end of the course the student will be able to: 1. Understand the basic concept of OM, manufacturing trends in INDIA. 2. Design of product layout, process layout and analyse process and capacity. 3. Applying appropriate inventory planning technique. 4. Forecast the demand and prepare MPS. 5. Constructing MRP, MRPII and schedule the jobs and machines.			

<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module.
<p>Textbooks</p>
<p>(1) Monks, J.G., Operations Management, McGraw-Hill International Editions, 1987</p>
<p>(2) Productions & operations management by Adam & Ebert.</p>
<p>(3)Pannerselvam. R., Production and Operations Management, PHI.</p>
<p>(4) Chase Jacobs Aquilano, Operations Management for Competitive</p>
<p>Reference Books</p>
<p>(1)Buffa, Modern Production/Operations Management, Wiely Eastern L</p>
<p>(2) Chary, S.N., Production and Operations Management, Tata-McGraw Hill</p>
<p>(3) Operations management by James Dilworth</p>
<p>(4) Lee J Karjewski and Larry P Ritzman, Operations Management – strategy and Analysis, 6thEdn, Pearson Education Asia</p>

ADVERTISEMENT & PUBLICITY			
Course Code	20MEM242	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
Need, Importance and Scope: Advertisibility, advertisibility goals, legal,ethicaland social aspects of advertising and publicrelations.			
Types of advertising and communicationsinadvertising.			10HRs
Module-2			
Advertisement Design: Copy Design, mechanics of copy preparations, essentials of a good copy, layout design and visualization effects, advertising theme.			
Media Decisions: Types of media, Media mix decisions, Criteria for evaluation ofmediaeffectiveness.			10HRs
Module-3			
Rural Advertising: Characteristics, Problems and Prospects.			
Advertising Aids: Trade Marks, Slogan package, point of purchase, displaysetc			10HRs
Module-4			
Measurement of Advertising Effectiveness: Methods and problems.			
Advertising Agency: Functions and Usefulness, Types, Dealing with agency,advertising Agency versus own, advertisingdepartment, advertising agencies in India			
Module-5			
Industrial and consumer goods and services advertising.			
Advertising Planning: Timing and Scheduling, Advertisement Budget, Types and sizes. Approaches to determining advertising budgets, limitations,advertisingresearch			10HRs
Course outcomes:			
At the end of the course the student will be able to:			
1. Understand the Advertisibility, advertisibility goals, legal,ethical and social aspects of advertising and publicrelations.			
2. Analyse the Advertisement Design&MediaDecisions.			
3. Understand the concept of Rural AdvertisingTrade Marks, Slogan package, point of purchase,displays.			
4. Analyse the Measurement of AdvertisingEffectiveness.			
5. Analyse the Advertising Planning.			

Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

- The question paper will have ten full questions carrying equal marks.
- Each full question is for 20marks.
- There will be two full questions (with a maximum of four sub questions) from eachmodule.
- Each full question will have sub question covering all the topics under amodule.
- The students will have to answer five full questions, selecting one full question from each module.■

Textbooks

(1) **Advertising Management** – David A. Aaker

(2) **Advertising in Business and Society** – William M, Weil Bacher.

Reference Books

(1) **The Systematic Approach to Advertising Creativity** – Bake

(2) **Advertising: The Process and Practice** – Engel

KNOWLEDGE MANAGEMENT			
Course Code	20MEM243	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>Knowledge Management: -KM Myths–KM Life Cycle– Understanding Knowledge–Knowledge, intelligence –Experience – Common Sense – Cognition and KM – Types of Knowledge – Expert Knowledge – Human Thinking and Learning, Knowledge society-from data to information to knowledge- Drivers of knowledge management Intellectual capital-KM and learning organizations- case studies. Strategic alignment- creating awareness-articulation- Evaluation and strategic alignment Infrastructural development and deployment- Leadership, measurement and refinement- RoleofCKO 10HRs</p>			
Module-2			
<p>Knowledge Management System Life Cycle: - Challenges in Building KM Systems–Conventional Versus KM System Life Cycle (KMSLS), Knowledge Creation and Knowledge Architecture – Nonaka’s Model of Knowledge Creation and Transformation. Knowledge Architecture Analyzing business environment-knowledge audit and analysis – designing KM team – creating KM system blue print- implementation- capture –store and sharing, Technology components –Internet, Intranet and Groupware solutions- tools for collaborative intelligence package choices, implementingsecurity. 10HRs</p>			
Module-3			
<p>Capturing Knowledge: Evaluating the Expert–Developing a Relationship with Experts–Fuzzy Reasoning and the Quality of Knowledge – Knowledge Capturing Techniques, Brain Storming – Protocol - Analysis – Consensus Decision Making – Repertory Grid- Concept Mapping –Definition – Computer based user machinesystem – Integrated system – Need for a database – Utilization of models – Evolution – Subsystems – Organizational subsystems – Activities subsystems. 10HRs</p>			
Module-4			
<p>Knowledge Codification: - Modes of Knowledge Conversion– Codification Tools and Procedures – Knowledge, Developer’s Skill Sets – System Testing and Deployment – Knowledge Testing– Approaches to Logical Testing, User Acceptance Testing – KM System Deployment Issues – User Training – Post implementation, Operating elements – Physical components – Processing functions – Outputs – MIS support for decision making – Structured programmable decisions – Unstructured non-programmable decisions – MIS structure based on management activity and Organizational functions– Synthesis ofMISstructure 10HRs</p>			
Module-5			
<p>Knowledge Transfer And Sharing: -Transfer Methods–Role of the Internet–Knowledge Transfer in e-world, KM System Tools – Neural Network– Association Rules – Classification Trees – Data mining and Business Intelligence – Decision Making Architecture – Data Management – Knowledge Management Protocols – Managing Knowledge Workers. Data Presentation – Communication Network – Distributed systems – Logical data concepts – Physical storagedevices – File organizations – Database organization – Transactionprocessing. 10HRs</p>			

<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the KM Myths–KM Life Cycle–Understanding Knowledge–Knowledge,intelligence. 2. Understand the different Knowledge Management System Life Cycle 3. Understand the Computer based user machine system – Integrated system – Need for a database – Utilization of models. 4. Understand the Knowledge Codification. 5. Analyse the different Knowledge Transfer And Sharing.
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. ■
<p>Textbooks</p> <p>(1) Knowledge Management - Elias. M. Award & Hassan M. Ghaziri – Pearson Education-2003</p> <p>(2) The essential guide to knowledge management, -Amrit Tiwana,' Pearson education-2001</p> <p>(3) Knowledge Management – Sudhir Warier, Vikas Publishing House, ISBN:81-259-1363-7. 1st Edition</p>
<p>Reference Books</p> <p>(1) Hand book on Knowledge Management – C W Holsapple, Springer, 2003 Porter M Competitive Advantage, Free Press, 1985</p> <p>(2) Knowledge Engineering and Management - Gus Schreiber, Hans Akkermans, Anjo Anjewierden, Robert de Hoog, Nigel, Shadbolt, Walter Van de Velde and Bob Wielinga, Universities Press, 2001.</p>

COMPOSITE MATERIALS			
Course Code	20MEM244	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>Introduction to composite materials: Definition, Classification, Types of matrices & reinforcements, characteristics & selection, Fiber composites, laminated composites, particulate composites, prepegs, sandwich construction. 10Hrs</p>			
Module-2			
<p>Micro mechanical analysis of a lamina: Introduction, Evaluation of the four elastic moduli – Rule of mixture, Macro mechanics of a lamina: Hooke's law for different types of materials, number of elastic constants, Laminate code, Failure criterion. 10Hrs</p>			
Module-3			
<p>Manufacturing: Lay up and curing – open and closed mould processing – Hand layup techniques Bag moulding and filament winding. Pultrusion, Pulforming, Thermoforming, Injection moulding, Cutting, Machining and joining, tooling, Quality assurance Introduction, material qualification, types of defects, NDT methods. 10Hrs</p>			
Module-4			
<p>Fabrication of Composites: Cutting, machining, drilling, mechanical fasteners & adhesive bonding joining computer aided design manufacturing tooling fabrication equipment Design of Fibre Reinforced Composite structures: Introduction, Composite structural design, Design criteria, Laminate design, Mathematical analysis of the laminate, Design of composite stiffeners. 10 Hrs</p>			
Module-5			
<p>Application developments – Aircrafts, missiles, space hardware, automobile, electrical and electronics, marine, recreational and sports equipment-future potential of composites. Metal matrix composites: Reinforcement materials, types, Characteristics & Selection, base metals-selection, applications. Powder metallurgy technique, liquid metallurgy technique. 10Hrs</p>			

<p>Course outcomes:</p> <p>At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Identify, describe and evaluate the properties of fibre reinforcements, polymer matrix materials and commercial composites. 2. Identify, describe rule of mixture and failure criteria for composites. 3. Develop competency in one or more common composite manufacturing techniques, and be able to select the appropriate technique for manufacture of compositematerials. 4. Understand and analyse fabrication of composites and design of structure ofcomposites. 5. Understand and recommend composites for different applications andMMCs
<p>Question paper pattern:</p> <p>The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from each module.
<p>Textbooks</p>
<p>(1)Composite Materials Handbook - Mein Schwartz - McGraw Hill Book Company - 1984.</p>
<p>(2)Mechanics of Composite Materials - AutarK.Kaw - CRC Press New York - 1sted, 1997</p>
<p>Reference Books</p>
<p>(1)Composite Materials hand book - MeingSchwaitz - McGraw Hill Book Company</p>
<p>(2) Forming Metal hand book, ASM handbook, V15, 1988, P327-338.</p>
<p>(3)Composite Science and Engineering - K.K.Chawla - Springer</p>

SIMULATION MODELING AND ANALYSIS			
Course Code	20MEM251	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
Introduction to Simulation: Appropriateness of simulation tool, Advantages, Disadvantages and Application areas of simulation, System and System Environment, Components of a system, Discrete and continuous systems, Model of a system, Types of models, Steps in a simulation study. 10HRs			
Module-2			
Discrete Event Simulation: Concepts in discrete-event simulation, Event-driven hand simulation – Examples on single channel queue, two server queue, and inventory systems. Statistical Models in Simulation: Terminology and concepts, Useful statistical models, discrete distributions, Continuous distributions. 10HRs			
Module-3			
Random Number Generation: Properties of random numbers, Techniques for generating random numbers- Linear congruential method –Combined linear congruential method; Tests for random numbers -The Kolmogorov-Smirnov test, the Chi-square test. 10HRs			
Module-4			
Random Variate Generation: Inverse Transforms technique- Exponential distribution, Uniform distribution, Weibull distribution, Triangular distribution, Empirical continuous distributions, Continuous distribution without a closed-form inverse, Discrete distribution, Generating approximate normal variate - Erlang distribution. Empirical Discrete Distribution: Acceptance -Rejection technique - Poisson distribution, Gamma distribution. 10HRs			
Module-5			
Design and Evaluation of Simulation Experiments: Variance reduction techniques -antithetic variables, Verification and validation of simulation models. Simulation Software: Need for simulation software, Selection of simulation software, Simulation packages (a brief note of software packages such as ARENA, AutoMod, Extend, Flexsim, WITNESS, ProMODEL, etc.). 10HRs			
Course outcomes: At the end of the course the student will be able to: 1. Describe the role of important elements of discrete event simulation and modeling paradigm. 2. Conceptualize real world situations related to systems development decisions, originating from source requirements and goals. 3. Develop skills to apply simulation software to construct and execute goal-driven system models. 4. Interpret the model and apply the results to resolve critical issues in a real world environment. 5. Understand the Input modeling, verification and validation of simulation models.			

Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

- The question paper will have ten full questions carrying equal marks.
- Each full question is for 20marks.
- There will be two full questions (with a maximum of four sub questions) from eachmodule.
- Each full question will have sub question covering all the topics under amodule.
- The students will have to answer five full questions, selecting one full question from each module.

Textbooks

(1) **Discrete-Event Simulation** – Jerry Banks, John S Carson, Barry S. Nelson, David M. Nicol, P Shahabudeen, Pearson, Latest Edition.

(2) **Handbook of Simulation** – Jerry Banks, Ed. John Wiley & Sons,

Reference Books

(1) **Simulation with Arena** – David Kelton, Sadowski, and Sturrock , McGraw Hill, Latest Edition

PRODUCT LIFE CYCLE MANAGEMENT			
Course Code	20MEM252	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
Product life cycle management – Need for PLM, Components of PLM, Product Data and Product workflow, Drivers for Change, The PLM Strategy, Developing a PLM Strategy, a Five-step Process 10HRs			
Module-2			
Strategy Identification and Selection, Strategy Elements, Implications of Strategy Elements, Policies, Strategy Analysis, Communicating the Strategy. 10HRs			
Module-3			
Change Management for PLM, Configuration management, and cost of design changes, schemes for concurrent engineering, Design for manufacturing and assembly, robust design. 10HRs			
Module-4			
Modeling, Current concepts, part design, sketching, use of datum's construction features, free ovalation, patterning, copying, and modifying features, reference standards for datum specification, Standards for Engineering data exchange. 10HRs			
Module-5			
Tolerance mass property calculations, rapid prototyping and tooling, finite modeling and analysis, general procedure, analysis techniques, Finite element modeling. Applicability of FEM, Static analysis, dynamic analysis. 10HRs			
Course outcomes: At the end of the course the student will be able to: 1. Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation. 2. Illustrate various approaches and techniques for designing and developing products. 3. Apply product engineering guidelines / thumb rules in designing products for molding, machining, sheet metal working etc. 4. Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plan 5. Understand the Tolerance mass property calculations.			
Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60. <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. ■ 			
Textbooks			
(1) Product Lifecycle Management Paradigm for century Product Realization - John Stark, Springer-Verlag, 21st, London, 3rd printing - 2006. 441 pp., ISBN: 1-85033-810-5			

(2) CAD/CAM Theory and Practice -Zeid, McGraw Hill.- 1991
Reference Books
(1) Computer Integrated Design and Manufacturing , - Mark Henderson & Philip Wolfe, Bedworth McGraw hill inc.- 1991
(2) Part modeling Users Guide , Engineer - 1998

ROBUST DESIGN			
Course Code	20MEM253	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>Quality by Experimental Design : Quality, western and Taguchi quality philosophy, Elements of cost, Noise factors causes of variation, Quadratic loss function and variation of quadratic loss functions.</p> <p>Robust Design :Steps in robust design : parameter design and tolerance design, reliability improvement through experiments, illustration through numerical examples.</p> <p style="text-align: right;">10Hrs</p>			
Module-2			
<p>Experimental Design: Classical experiments: factorial experiments, terminology, factors. Levels, Interactions, Treatment combination, randomization, 2-level experimental design for two factors and three factors. 3-level experiment designs for two factors and three factors, factor effects, factor interactions, Fractional factorial design, Saturated design, Central composite designs, Illustration through numerical examples.</p> <p style="text-align: right;">10Hrs</p>			
Module-3			
<p>Measures of Variability : Measures of variability, Concept of confidence level, Statistical distributions : normal, log normal and Weibull distributions. Hypothesis testing, Probability plots, choice of sample size illustration through numerical examples.</p> <p>Analysis and interpretation of experimental data: Measures of variability, Ranking method, column effect method and plotting method, Analysis of variance (ANOVA), in factorial experiments : YATE's algorithm for ANOVA, Regression analysis, Mathematical models from experimental data, illustration through numerical examples.</p> <p style="text-align: right;">10Hrs</p>			
Module-4			
<p>Taguchi's Orthogonal Arrays : Types orthogonal arrays, Selection of standard orthogonal arrays, Linear graphs and interaction assignment, dummy level technique, Compound factor method, modification of linear graphs, Column merging method, Branching design, Strategies for constructing orthogonal arrays.</p> <p>Signal to Noise ratio (S-N Ratios) : Evaluation of sensitivity to noise, Signal to noise ratios for static problems, Smaller – the – better types, Nominal – the – better – type, larger – the- better – type. Signal to noise ratios for dynamic problems, Illustrations through numerical examples.</p> <p style="text-align: right;">10Hrs</p>			
Module-5			
<p>Parameter Design and Tolerance Design : Parameter and tolerance design concepts, Taguchi's inner and outer arrays, Parameter design strategy, Tolerance design strategy, Illustrations through numerical examples.</p>			

<p>Reliability Improvement Through Robust Design : Role of S-N ratios in reliability improvement ; Case study; Illustrating the reliability improvement of routing process of a printed wiring boards using robust design concepts.</p> <p style="text-align: right;">10Hrs</p>
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Create designs that have a minimal sensitivity to input variation 2. Reduce design costs 3. Determine which design parameters have the largest impact on variation 4. Optimize designs with multiple outputs. 5. Understand the Parameter Design and Tolerance Design.
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module.
<p>Textbooks</p>
<p>(1) Quality Engineering using Robust Design - Madhav S. Phadake: Prentice Hall, Englewood Cliffs, New Jersey 07632, 1989.</p>
<p>(2) Design and analysis of experiments - Douglas Montgomery: Wiley India Pvt. Ltd., V Ed., 2007</p>
<p>(3) Techniques for Quality Engineering - Phillip J. Ross: Taguchi 2nd edition. McGraw Hill Int. Ed., 1996</p>
<p>Reference Books</p>
<p>(1) Quality by Experimental Design - Thomas B. Barker - Marcel Dekker Inc ASQC Quality Press, 1985</p>
<p>(2) Experiments planning, analysis and parameter design optimization - C.F. Jeff Wu, Michael Hamada - John Wiley Ed., 2002</p>
<p>(3) Reliability improvement by Experiments - W.L. Condra, - Marcel Dekker Inc ASQC Quality Press, 1985</p>

INDUSTRIAL ROBOTICS			
Course Code	20MEM254	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	4:0:0	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
<p>FUNDAMENTAL CONCEPTS OF ROBOTICS: History, present status and future trends, Robotics. Robot, Definition. Robotics Systems and Robot Anatomy, Specification of Robotics. Resolution, Repeatability and Accuracy of a Manipulator.</p> <p>ROBOT DRIVES: Power transmission systems and control Robot drive mechanisms, hydraulic-electric-pneumatic drives. Mechanical transmission method – Rotary-to-Rotary motion conversion. Rotary-to-linear motion conversion end effectors – types-grip and problem Remote-Centered compliance Devices- Control of Actuators in Robotic Mechanisms. 10Hrs</p>			
Module-2			
<p>SENSORS AND INTELLIGENT ROBOTS: Sensory devices – Non-optical-Position sensors – Optical position sensors – velocity sensors – proximity sensors: Contact and non-contact type- Touch and slip sensors – Force and Torque Sensors – AI and Robotics.</p> <p>COMPUTER VISION FOR ROBOTICS SYSTEMS: Robot vision systems – Imaging components – Image representation – Hardware aspects-Picture coding – Object Recognition and Categorization- Visual inspection – software considerations – applications – commercial – Robotics visionsystems. . 10Hrs</p>			
Module-3			
<p>COMPUTER CONSIDERATIONS FOR ROBOTIC SYSTEMS: Computer architecture for robots, hardware, Computational elements in robotic applications – Robot programming – sample programs path planning – Robot’s computer system.. 10Hrs</p>			
Module-4			
<p>TRANSFORMATIONS AND KINEMATICS: Homogeneous Co-ordinates – Co-ordinate Reference Frames – Homogeneous Transformations for the manipulator – the forward and inverse probleme of manipulator kinematics – Motion generation – Manipulator dynamics – Jacobian in terms of D.H.Matrices controller architecture. 10Hrs</p>			
Module-5			
<p>ROBOT CELL DESIGN AND CONTROL: Specifications of Commerical Robots – Robot Design and Process specifications – motor selection in the design of a robotic joint – Robot Cell layouts – Economic and Social aspects of robotics.</p> <p>APPLICATIONS OF ROBOTS: Capabilities of Robots – Robotics Applications – Obstacle avoidance – Robotics in India – The future of Robotics. 10Hrs</p>			

<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the concept of robotics and its drives. 2. Understand the sensors applications and images recognition mechanism. 3. Program robot and analyse the computational element of robot computer system. 4. Transform robot manipulator using knowledge kinematics and mathematical methods. 5. Design and control robot cells and understand the application of robots.
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. ■
<p>Textbooks</p>
<p>(1) Robotics Engineering An integrated approach - Richard D Klafter, Thomas A Chmielewski, Michael Negin – Prentice Hall of India Pvt. Ltd.</p>
<p>(2) Robotics: Control Sensing, Vision, intelligence - Fu KS Gomalier R C, Lee C S G - McGraw Hill</p>
<p>Reference Books</p>
<p>(1) Handbook of Industrial Robotics - Shuman Y. Nof - John Wiley & Sons, New York - 1985.</p>
<p>(2) Robotics Technology and Flexible Automation - Deb SR - McGraw Hill BookCo. - 1994.</p>

STATISTICAL TOOLS LAB			
Course Code	20MEML2 6	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	0:4:0	SEE Marks	60
Credits	02	Exam Hours	03
Sl. NO	Experiments		
1	Creation of a database and presentation of data sets		
2	Exploring Data Introduction and Describing Data - Relationships Among Variables		
3	Probability Distributions Probability and Distributions -Normal and Binomial Distributions		
4	Statistical Inference Sampling and Sampling Distributions		
5	Statistical Inference - Confidence Intervals		
6	Statistical Inference - Hypothesis Testing		
7	Analysis of Variance (ANOVA)		
8	Factor Analysis		
9	Regression Modelling and Analysis		
10	Bivariate and Multivariate Analysis		
Course outcomes: At the end of the course the student will be able to: 1. Understand Creation of a database and presentation of data sets. 2. Understand the Probability Distributions- Normal and Binomial Distribution. 3. Understand the Statistical Inference - Confidence Intervals, Hypothesis Testing . 4. Understand the Analysis of Variance (ANOVA).			
Question paper pattern: The SEE questions will be set for 100 marks: 1. Two experiments for 80 marks. 2. Viva voce for 20 marks.			

TECHNICAL SEMINAR			
Course Code	20MEM27	CIE Marks	100
Number of contact Hours/week	0:0:2	SEE Marks	--
Credits	02	Exam Hours	--
<p>Course objectives: The objective of the seminar is to inculcate self-learning, face audience confidently, enhance communication skill, involve in group discussion and present and exchange ideas. Each student, under the guidance of a Faculty, is required to</p> <ul style="list-style-type: none"> • Choose, preferably through peer reviewed journals, a recent topic of his/her interest relevant to the Course of Specialization. • Carryout literature survey, organize the Course topics in a systematic order. • Prepare the report with own sentences. • Type the matter to acquaint with the use of Micro-soft equation and drawing tools or any such facilities. • Present the seminar topic orally and/or through power point slides. • Answer the queries and involve in debate/discussion. • Submit two copies of the typed report with a list of references. <p>The participants shall take part in discussion to foster friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident. The CIE marks for the seminar shall be awarded (based on the relevance of the topic, presentation skill, participation in the question and answer session and quality of report) by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three faculties from the department with the senior most acting as the Chairperson.</p>			
<p>Marks distribution for CIE of the course 20MEM27 seminar: Seminar Report: 30 marks Presentation skill: 50 marks Question and Answer: 20 marks</p>			

*** END OF II SEMESTER ***

MODERN TRENDS IN MANAGEMENT			
Course Code	20MEM31	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:2	SEE Marks	60
Credits	04	Exam Hours	03
Module-1			
Just in Time Ideas: Introduction of JIT Concepts, Difference between Conventional Material Control technique and IIT, Steps in implementing JIT, J.I.T. as a management Kaizen concept. Feasibility of JIT concepts to Indian Industries. 10HRs			
Module-2			
Implementing a Program for continuous Improvement: Japanese concept of continuous Improvement. (KAIZEN mean continuous Improvement), Innovation concept of Improvement, Need for continuous improvement, Steps in implementing continuous improvement. 10HRs			
Module-3			
Quality Circles: Definition of quality circles, Quality circles as a tool for problem solving, Q.C. as a group oriented KAIZEN. 10HRs			
Module-4			
Kanban System: Definition of KANBAN, Difference between PULL & PUSH Systems of Material Control, KANBAN as a Push System, KANBAN as JIT concept. 10HRs			
Module-5			
Concurrent Engineering: Definition of Concurrent Engineering. Design for Manufacturing and Assembly (DFMA), Concurrent Engineering, Team, Advantages of concurrent Engineering. 10HRs			
Course outcomes: At the end of the course the student will be able to: <ol style="list-style-type: none"> 1. Understand the concept of Just in Time concept Ideas. 2. Understand the Japanese concept of continuous Improvement. (KAIZEN mean continuous Improvement) 3. Understand the Definition of quality circles, Quality circles as a tool for problem solving, Q.C. as a group oriented KAIZEN 4. Understand the Kanban System 5. Understand the concept of Concurrent Engineering. 			
Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60. <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. ■ 			
Textbooks			
(1) Just in Time Manufacturing - Amaldo Hernandez - PH International			
(2) Just in Time - Productivity Process - David Hutehins - Jaco			

INDUSTRIAL MARKETING			
Course Code	20MEM321	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
<p>Introduction: The Industrial Marketing Concept Marketing System: Participant, Channels, Contracts of Sale, Franchise Agreements Loyalty, Confidence and Reciprocity.</p> <p>Demand and Product Characteristics: Market levels and product type. Derived demand; Influence of ultimate buyer, business conditions, Financial conditions, Influence of price. 08HRs</p>			
Module-2			
<p>Industrial Customer: Buyer Motives: The core variables, Quality, Service, Price, Savings assurance of supply and buyer temperament, Buyer characteristics, Customer types.</p> <p>Marketing Strategy: The concept of strategy Mission Strategy, Operating, plans, Organizational Plan and logistical plans; choice of strategy components. 08HRs</p>			
Module-3			
<p>The Channel Component: Industrial Distributors, Geographical Distributions, Size, Characteristics. Condition influencing channel structure, Intensive versus selective strategy.</p> <p>The Price Component: Condition affecting price: Condition affecting price: Competition, firm size product type, Direct and Indirect Costs. The nature of demand. Pricing decisions, New Markets versus established markets pricing policies; Net pricing; Discount pricing, trades discount, Quantity discounts and cash discounts. Legal considerations and pricing methods. 08HRs</p>			
Module-4			
<p>The Promotional Component: Advertising functions, motivating distributions sales and message case of advertising agencies. Sales promotion and public relations promotional letters and novelties personal selling and selling support. 08HRs</p>			
Module-5			
<p>Marketing Control: Strategic goals. Identifying market opportunity. Short-term goals expense based goals. The market and sales budget. Budgetary Control, the process of control. Comprising standards and performance. Corrective action. 08HRs</p>			
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Analyse the Industrial Marketing Concept. 2. Understand the Industrial Customer & Marketing Strategy 3. Understand the The Channel Component. 4. Understand the Advertising functions, motivating distributions sales and message case of advertising agencies. 5. Understand the concept of marketing controls, strategic goals. 			

Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

- The question paper will have ten full questions carrying equal marks.
- Each full question is for 20marks.
- There will be two full questions (with a maximum of four sub questions) from eachmodule.
- Each full question will have sub question covering all the topics under amodule.
- The students will have to answer five full questions, selecting one full question from each module. ■

Textbooks

(1) **Industrial Marketing** -Richard M. Hill.Ralph. S. Alexander and James S. Cross. Published by AITBS, New Delhi.

(2) **Industrial Marketing** -Phadtare, PHI Pvt., Ltd

Reference Books

(1) **Industrial Marketing -A process of creating and maintaining exchanges-** KrishnamachryulyCsg, Lalitha R - Jaico Book House

QUALITY AND RELIABILITY ENGINEERING			
Course Code	20MEM322	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
<p>Basic Concepts: Definitions of quality and Reliability, Parameters and Characteristics, Quality control, statistical Quality Control, Reliability concepts.</p> <p>Concepts in Probability and Statistics : Events, Sample Space, Probability rules, Conditional probability, Dependent and Independent Events, Application of Probability concepts in Quality Control, Problems. 08HRs</p>			
Module-2			
<p>Introduction to Probability Distributions : Normal, Poisson and Binomial distribution. Control Charts : Variable Chart – X Bar chart, R-chart and Sigma chart. Attribute Chart : P – Chart, nP Chart, C-Chart and U – Chart. 08HRs</p>			
Module-3			
<p>Acceptance Sampling: Fundamentals of acceptance sampling, types of acceptance sampling, O.C Curve, AQL, LTPD, AOQL.</p> <p>Failure Data Analysis : Introduction, Failure Data, Quantitative measures, MTTF, MTBF, Bathtub Curve, Mean Life, Life Testing, Problems, Introduction to Failure Mode and Effect Analysis. 08HRs</p>			
Module-4			
<p>System Reliability: Series, parallel and mixed configuration, Block diagram concept, r- out- of-n structure solving problems using mathematical models.</p> <p>Reliability Improvement and Allocation : Difficulty in achieving reliability, Methods for improving reliability during design, Different techniques available to improve reliability. 08HRs</p>			
Module-5			
<p>Maintainability and Availability: Introduction, Formulas, Techniques available to improve maintainability and availability trade-off among reliability, maintainability and availability, Simple problems. 08HRs</p>			
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the quality and basic probability concept. 2. Construct the control chart for variables. 3. Construct the control chart for attributes and analyse failure data. 4. Construct OC curve for determining the probability of lot acceptance. 5. Understand the basic concept of reliability and calculate maintainability and availability of resources. 			

Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

- The question paper will have ten full questions carrying equal marks.
- Each full question is for 20marks.
- There will be two full questions (with a maximum of four sub questions) from eachmodule.
- Each full question will have sub question covering all the topics under amodule.
- The students will have to answer five full questions, selecting one full question from each module. ■

Reference Books

(1) Quality Planning and Analysis - Tata McGraw - Juran, J.M and Gryna, F.M. - Hill publishing Coimpany Ltd., New Delhi, India –1982.

(2) Maintainability and Reliability Handbook of Reliability Engineering and Management - Editors –Ireson. W.G. andCooms-C.F. McGraw - Hill Book Company Inc. –1988.

(3) Concepts in Reliability Engineering- Srinath L S - Affiliated East-West Press Private Limited, New Delhi, India. –1985.

(4) An Introduction to Reliability and Maintainability Engineering - TMH Charles Ebeling - Tata Mcgraw Hill –2000.

(5) Reliability Engineering - A K Govil - Prentice Hall –1981

INDUSTRIAL DESIGN & ERGONOMICS			
Course Code	20MEM323	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
<p>Introduction: An approach to industrial design - elements of design structure for industrial design in engineering application in modern manufacturing systems. Ergonomics and Industrial Design: Introduction - general approach to the man-machine relationship-workstation design-working position. 08HRs</p>			
Module-2			
<p>Control and Displays: shapes and sizes of various controls and displays-multiple displays and control situations - design of major controls in automobiles, machine tools etc., - design of furniture - design of instruments. 08HRs</p>			
Module-3			
<p>Ergonomics and Production: Ergonomics and product design ergonomics in automated systems- expert systems for ergonomic design, Anthropomorphic data and its applications in ergonomic design limitations of anthropomorphic data-use of computerized database... . 08HRs</p>			
Module-4			
<p>Visual Effects of Line and Form: The mechanics of seeing psychology of seeing, general influences of line and form. Colour: colour and light - colour and objects - colour and the eye colour consistency - colour terms - reactions to colour and colour continuation - colour on engineering equipments. 08HRs</p>			
Module-5			
<p>Aesthetic Concepts: Concept of unity - concept of order with variety - concept of purpose style and environment - Aesthetic expressions. Style-components of style - house style, observations style in capital goods. Industrial Design in Practice: General design - specifying design equipments - rating the importance of industrial design - industrial design in the design process. 08HRs</p>			
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understanding the concepts of Industrial design and man-machine relationship. 2. Design of optimistic display and control devices for various applications. 3. Applying the anthropomorphic data in ergonomic design. 4. Understanding the visual effects of lines, form and color on engineering equipments. 5. Choosing appropriate aesthetic aspects for design of industrial machinery and devices. 			

Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

- The question paper will have ten full questions carrying equal marks.
- Each full question is for 20marks.
- There will be two full questions (with a maximum of four sub questions) from eachmodule.
- Each full question will have sub question covering all the topics under amodule.
- The students will have to answer five full questions, selecting one full question from each module. ■

Textbooks

(1)Industrial design for Engineers - Mayall W.H. - LondonCliffee Books Ltd.

(2)Applied Ergonomics Hand Book - Brien Shakel (Edited) - Butterworth Scientific,

ADVANCED FLUID POWER SYSTEMS			
Course Code	20MEM324	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
<p>Introduction: Pascal Law, Advantages of Fluid Power, Applications of Fluid Power, Components of a FluidPower.</p> <p>Hydraulic Power Unit: Introduction, Pumping Theory, Pump Classification, Gear Pumps, (Vane Pumps- simple, balanced & pressure compensated vane pump, Vane design) Piston Pumps- Radial, Axial (Bent axis & Swash plate), Pump Performance, Pump Noise, Ripple in pumps.</p> <p>Hydraulic Actuators: Linear actuator- cylinders, Mechanics of Hydraulic cylinder loading, limited rotation hydraulic actuator, cylinder cushioning, Gear, Vane & Piston motor, Motor performance, Hydrostatictransmission.. 08HRs</p>			
Module-2			
<p>Power Controlling Elements – Valves :</p> <p>i) Directional Control Valves – Classification, 2/2, 3/2,4/2 & 4/3 ways Dcv’s, Different Centre configurations in 4/3 way valves, actuation of DCV’s, Indirect actuation, Valve Lap – Lap during Stationary and duringswitching.</p> <p>ii) Pressure Control Valves: Classification, opening & Closing Pressure difference, Cracking Pressure, Pressure Relief Valve – Simple & Compound type, Pressure reducing valve, sequence, unloading &Counter balance valve, Pressureswitches.</p> <p>iii) Flow Control valves – Fixed throttle, Variable throttle, Pressure Compensation principles, pressure compensated Flow control valve – Reducing & Relieftype.</p> <p>iv) Check valve, Pilot operated checkvalve. 08HRs</p>			
Module-3			
<p>Hydraulic Circuit Design & Analysis: Control of Single & double acting cylinder, Regeneration circuit, cylinder sequencing & Synchronizing circuit. Speed control of cylinder & Motors, Analysis of Hydraulic system with frictional losses, Accumulators &accumulator circuits.</p> <p>Pneumatic System: Introduction, – Generation of compressed air, air receiver, servicing FRL unit, Air filter, pressure regulation, lubricator, Pneumatic cylinder & air motor – different types of cylinder, cushion assembly. Cylinder performance.</p> <p>Pneumatic Valve: Directional control valves, impulse valve, Quick exhaust valve, shuttle valve, Twin pressure valve, Time delayvalve. 08HRs</p>			
Module-4			
<p>Pneumatic Circuit & Logic Circuits:- Control of single and double acting cylinder, impulse operation, speed control, sequencing, Pneumatic Vacuum system AND,OR, NOT, NAND, NOR, YES Function, Logic circuits design using shuttle valve & twin pressure</p>			

valve, Binary Arithmetic, logic & Boolean Algebra, use of karnaughveitch map for pneumatic circuit design. 08HRs
Module-5
Electrical Control in Fluid Power: Contactors, &Switches, Relays, Limit switch, Electro hydraulic & Electro Pneumatic Circuits, Simple Cylinder reciprocation, interlocking using relays, Proximity switches, application of proximity switches, Time dependent will dependent and travel dependent circuits. 08HRs
Course outcomes: At the end of the course the student will be able to: 1. Understand the basic concepts of fluid power and applications like pump andactuators. 2. Obtain the knowledge of appropriate selection of control for specific application. 3. Design hydraulic and pneumatic circuitalsystem. 4. Design the pneumatic and logic circuits based on mathematical technique. 5. Understand the application of electric elements in controlling the fluidpower.
Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60. <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from each module. ■
Textbooks
(1)Fluid Power with Application - Anthony Esposito - Peason Education - 5th edition.
(2)Oil hydraulics -Principles & maintenance - S.R. Majumdar - Tata M C Graw Hill
Reference Books
(1)Components & Application - Bosch Rexroth didactic - Hydraulics Trainer - vol 1. Publication
(2)Pneumatic System, Principles and Maintenance - S.R. Majumdar - Tata M C GrawHillPublication.
(3)Pneumatics: Theory and Applications - Bosch Rexroth didactic - Publication
(4) Electro Pneumatics - Bosch Rexroth didactic -Vol. 2, Publication.

PRODUCT DESIGN AND DEVELOPMENT			
Course Code	20MEM331	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
<p>Introduction: Characteristics of successful product development, Design and development of products, duration and cost of product development, the challenges of product development.</p> <p>Development Processes and Organizations: A generic development process, concept development: the front-end process, adopting the generic product development process, the AMF development process, product development organizations, the AMF organization.</p> <p>Product Planning: The product planning process, identify opportunities. Evaluate and prioritize projects, allocate resources and plan timing, complete pre project planning, reflect all the results and the process. 08HRs</p>			
Module-2			
<p>Identifying Customer Needs: Gather raw data from customers, interpret raw data in terms of customer needs, organize the needs into a hierarchy, establish the relative importance of the needs and reflect on the results and the process.</p> <p>Product Specifications: What are specifications, when are specifications established, establishing target specifications, setting the final specifications.</p> <p>Concept Generation: The activity of concept generation, clarifies the problem, search externally, search internally, explore systematically, reflect on the results and the process. 08HRs</p>			
Module-3			
<p>Concept Selection: Overview of methodology, concept screening, and concept scoring,</p> <p>Concept Testing: Define the purpose of concept test, choose a survey population, choose a survey format, communicate the concept, measure customer response, interpret the result, reflect on the results and the process.</p> <p>Product Architecture: What is product architecture, implications of the architecture, establishing the architecture, variety and supply chain considerations, platform planning, related system level design issues. 08HRs</p>			
Module-4			
<p>Industrial design: Assessing the need for industrial design, the impact of industrial design, industrial design process, managing the industrial design process, assessing the quality of industrial design.</p> <p>Design for Manufacturing: Definition, estimation of manufacturing cost, reducing the cost of components, assembly, supporting production, impact of DFM on other factors.</p> <p>Prototyping: Prototyping basics, principles of prototyping, technologies, planning for prototypes. 08HRs</p>			

Module-5
<p>Product Development Economics: Elements of economic analysis, base case financial mode,. Sensitive analysis, project trade-offs, influence of qualitative factors on project success, qualitative analysis.</p> <p>Managing Projects: Understanding and representing task, baseline project planning, accelerating projects, project execution, postmortem projectevaluation. 08HRs</p>
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Identify and analyse the product design and development processes in manufacturingindustry. 2. Define the components and their functions of product design and development processes and their relationships from concept to customer over whole productlifecycle. 3. Analyse, evaluate and apply the methodologies for product design, development andmanagement. 4. Undertake a methodical approach to the management of product development to satisfy customerneeds. 5. Carry out cost and benefit analysis through various costmodels.
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from eachmodule.
Textbook/ Textbooks
(1)Product Design and Development - Karl.T.Ulrich, Steven D
Reference Books
(1) Product Design and Manufacturing - A C Chitale and R C Gupta, PH1, - 3rd Edition, 2003
(2) New Product Development - Timjones. Butterworth Heinmann - Oxford. UCI -1997

PRODUCT DATA MANAGEMENT			
Course Code	20MEM332	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
<p>Product Data Management : Product life cycle, Complexity in Product Development, General Description of PDM Basic functionality of PDM: Information architecture, PDM System architecture, Applications used in PDM systems. Trends in PDM.</p> <p style="text-align: right;">08HRs</p>			
Module-2			
<p>Document Management Systems: Document management and PDM, Document life cycle, Content Management, Document management and related technologies, Document management resources on the Internet.</p> <p style="text-align: right;">08HRs</p>			
Module-3			
<p>Workflow Management in PDM: Structure Management, Engineering Change Management, Release Management, Version Management, Configuration Management.</p> <p style="text-align: right;">08HRs</p>			
Module-4			
<p>Creating Product Structures: Part centric approach, CAD centric approach, Product Structure configuration, Managing Product Structures,PDM Tools: Matrix One, TeamCenter, Windchill. Enovia, PDM resources on the Internet.</p> <p style="text-align: right;">08HRs</p>			
Module-5			
<p>PDM Implementation Case Studies: Sun Microsystems, Inc., Mentor Graphics Corporation, Ericsson Radio Systems AB, Ericsson Mobile Communications AB, ABB Automation Technology Products, SaabTechElectronics AB.</p> <p style="text-align: right;">08HRs</p>			
<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Explain the concepts, tools and techniques for managing product data. 2. Analyze various processes in the product data management frameworks. 3. Evaluate risks in large and complex workflow management environments. 4. Develop product data management plans for various types of organizations. 5. Understand the PDM and ABBtechnologies. 			

Question paper pattern:

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.

- The question paper will have ten full questions carrying equal marks.
- Each full question is for 20marks.
- There will be two full questions (with a maximum of four sub questions) from eachmodule.
- Each full question will have sub question covering all the topics under amodule.
- The students will have to answer five full questions, selecting one full question from each module. ■

Reference Books

(1)Implementing and Integrating Product Data Management and Software Configuration Management - 20 - IvicaCmkovic Ulf Asklund - AnnitaPerssonDahlqvist - ArchtechHousePublishers.

(2)Product Data Management - Rodger Burden - Publisher: Resource Publishing- ISBN-10: 0970035225, ISBN-13: 978-0970035226 –2003.

(3)The AutoCAD Database Book – Accessing and Managing CAD Drawing Information- Galgotia Publications - ThirdEdition.

PRODUCT PLANNING AND MARKETING			
Course Code	20MEM333	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
Product strategy and planning product - market evolution, successful product development process, characteristics of successful product development			
New Product Strategy: Strategic response, reactive versus proactive strategies, marketing versus Research and Development, Comprehensive strategy. 08HRs			
Module-2			
Proactive new product development process - Sequential decision process, reasons for product failure and strategies to avoid failures, cost, time, risk and expected benefit in new product development. . . . 08HRs			
Module-3			
Opportunity Identification - Market definition and entry strategy, desirable characteristics of markets, market profile analysis, methods for market definition, target group selection through market segmentation, market selection, idea generation – idea sources, method of generating ideas, ideamanagement. 08HRs			
Module-4			
Consumer measurement and Perceptual mapping – Consumer measurement process, research methods, sampling, measuring instruments, attitude scaling, Consumers perceptions of new and existing products: Perceptual positioning, Perceptual maps, Analytic Methods used to produce Perceptual maps, Managerial review of maps.			
Product positioning – Preference analysis and benefits, segmentation- Role of preference in product positioning, proactive product positioning, Analytic preference models and estimation methods, Benefit segmentation, managerial use of preference models. 08HRs			
Module-5			
Forecasting sales potential – Role of purchase potential in design process, models of purchase potential, models of sales formation, managerial use of purchase models.			
Launching the products and Strategy for Testing new products – Planning and tracking launch of durable and industrial products, advertising testing and product quality testing. 08HRs			

<p>Course outcomes: At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Understand the concept of Product strategy and planning product. 2. Analyse the Proactive new product development process. 3. Understand the concept of Opportunity Identification. 4. Understand the concept of Product positioning – Preference analysis and benefits, segmentation. 5. Understand the concept of Launching the products and Strategy for Testing new products.
<p>Question paper pattern: The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.</p> <ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20 marks. • There will be two full questions (with a maximum of four sub questions) from each module. • Each full question will have sub question covering all the topics under a module. • The students will have to answer five full questions, selecting one full question from each module. ■
<p>Textbooks</p>
<p>(1) Glen L. Urban. John R. Hauser, “Design and Marketing of New products” A Prentice Hall, Englewood cliffs, New Jersey, 1993</p>
<p>(2) William L. Moore & Edgar, “Product Planning and Management”, A. Pessemer</p>

AGILE MANUFACTURING			
Course Code	20MEM334	CIE Marks	40
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
Module-1			
Introduction - What is agile Manufacturing? - Competitive environment of the future thebusiness case for agile manufacturing conceptual frame work foragilemanufacturing.			08HRs
Module-2			
Four Core Concepts: Strategy driven approach - integrating organization, people technologyInterdisciplinary design methodology..			08HRs
Module-3			
Agile Manufacturing and Change Management: The change implications. Post failures inadvanced manufacturing, changes on the way, traditional management accounting, paradigm,investment appraisal, product costing - performance, measurement and control systems,Traditional, control technological and design paradigms traditional problems in workplaceorganizationalissues - role of technology. 08HRs			
Module-4			
Agile Manufacturing Enterprise Design: Agile manufacturing - enterprise design. Systemconcepts as the basic manufacturing theory - joint technical & organizational design and amodel for the design of agile manufacturing enterprise, enterprise design process insights intodesign processes, what is interdisciplinary design, Main issues - simple design example. 08HRs			
Module-5			
Skill & Knowledge Enhancing Technologies for Agile Manufacturing: Skill and Knowledge enhancing Technologies - scheduling - technology design strategic-Design Concepts. Design and Skill of Knowledge enhancing Technologies for machine tool systems – Historical overview, Lessons, problems and Futurdevelopment.			08HRs
Course outcomes:			
At the end of the course the student will be able to:			
<ol style="list-style-type: none"> 1. Understand the agile manufacturing and conceptual framework. 2. Analyse the four core concept of agilemanufacturing. 3. Study the implication of advanced manufacturingsystem. 4. Understand and design the agile manufacturingenterprises. 5. Design skill and knowledge enhancing technology for agile manufacturing. 			
Question paper pattern:			
The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 60.			
<ul style="list-style-type: none"> • The question paper will have ten full questions carrying equal marks. • Each full question is for 20marks. • There will be two full questions (with a maximum of four sub questions) from eachmodule. • Each full question will have sub question covering all the topics under amodule. • The students will have to answer five full questions, selecting one full question from each module. ■ 			
Reference Books			

(1) 1. Agile manufacturing - Forging new Frontiers - Paul T. Kidd - Addison Wesley Publication 1994.
(2) 2. Agile Manufacturing – Proceedings of International Conference - Dr. M.P Chowdiah(Editor)–TataMcGraw Hill Publications - 1996.
(3) 3. on agile manufacturing - Tata McGraw Hill Publications -1996

PROJECT WORK PHASE – 1			
Course Code	20MEM34	CIE Marks	100
Number of contact Hours/Week	2	SEE Marks	--
Credits	02	Exam Hours	--
<p>Course objectives:</p> <ul style="list-style-type: none"> • Support independent learning. • Guide to select and utilize adequate information from varied resources maintaining ethics. • Guide to organize the work in the appropriate manner and present information (acknowledging the sources) clearly. • Develop interactive, communication, organisation, time management, and presentation skills. • Impart flexibility and adaptability. • Inspire independent and teamworking. • Expand intellectual capacity, credibility, judgement, intuition. • Adhere to punctuality, setting and meeting deadlines. • Instil responsibilities to oneself and others. • Train students to present the topic of project work in a seminar without any fear, face audience confidently, enhance communication skill, involve in group discussion to present and exchange ideas. 			
<p>Project Phase-1 Students in consultation with the guide/s shall carry out literature survey/ visit industries to finalize the topic of the Project. Subsequently, the students shall collect the material required for the selected project, prepare synopsis and narrate the methodology to carry out the project work.</p> <p>Seminar: Each student, under the guidance of a Faculty, is required to</p> <ul style="list-style-type: none"> • Present the seminar on the selected project orally and/or through power point slides. • Answer the queries and involve in debate/discussion. • Submit two copies of the typed report with a list of references. <p>The participants shall take part in discussion to foster friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident.</p>			
<p>Course outcomes:</p> <p>At the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Demonstrate a sound technical knowledge of their selected project topic. • Undertake problem identification, formulation, and solution. • Design engineering solutions to complex problems utilising a systems approach. • Communicate with engineers and the community at large in written and oral forms. • Demonstrate the knowledge, skills and attitudes of a professional engineer. 			
<p>Continuous Internal Evaluation</p> <p>CIE marks for the project report (50 marks), seminar (30 marks) and question and answer (20 marks) shall be awarded (based on the quality of report and presentation skill, participation in the question and answer session by the student) by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three faculty from the department with the senior most acting as the Chairperson.</p>			

MINI PROJECT			
Course Code	20MEM35	CIE Marks	40
Number of contact Hours/Week	2	SEE Marks	60
Credits	02	Exam Hours/Batch	03
<p>Course objectives:</p> <ul style="list-style-type: none"> • To support independent learning and innovative attitude. • To guide to select and utilize adequate information from varied resources upholding ethics. • To guide to organize the work in the appropriate manner and present information (acknowledging the sources) clearly. • To develop interactive, communication, organisation, time management, and presentation skills. • To impart flexibility and adaptability. • To inspire independent and teamworking. • To expand intellectual capacity, credibility, judgement, intuition. • To adhere to punctuality, setting and meeting deadlines. • To instil responsibilities to oneself and others. • To train students to present the topic of project work in a seminar without any fear, face audience confidently, enhance communication skill, involve in group discussion to present and exchange ideas. 			
<p>Mini-Project: Each student of the project batch shall involve in carrying out the project work jointly in constant consultation with internal guide, co-guide, and external guide and prepare the project report as per the norms avoiding plagiarism.</p>			
<p>Course outcomes:</p> <p>At the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Present the mini-project and be able to defend it. • Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task. • Habituated to critical thinking and use problem solving skills. • Communicate effectively and to present ideas clearly and coherently in both the written and oral forms. • Work in a team to achieve common goal. • Learn on their own, reflect on their learning and take appropriate actions to improve it. 			
<p>CIE procedure for Mini - Project:</p> <p>The CIE marks awarded for Mini - Project, shall be based on the evaluation of Mini - Project Report, Project Presentation skill and Question and Answer session in the ratio 50:25:25. The marks awarded for Mini - Project report shall be the same for all the batch mates.</p> <p>Semester End Examination</p> <p>SEE marks for the mini-project shall be awarded based on the evaluation of Mini-Project Report, Presentation skill and Question and Answer session in the ratio 50:25:25 by the examiners appointed by the University.</p>			

INTERNSHIP / PROFESSIONAL PRACTICE			
Course Code	20MEMI36	CIE Marks	40
Number of contact Hours/Week	2	SEE Marks	60
Credits	06	Exam Hours	03
<p>Course objectives:</p> <p>Internship/Professional practice provide students the opportunity of hands-on experience that include personal training, time and stress management, interactive skills, presentations, budgeting, marketing, liability and risk management, paperwork, equipment ordering, maintenance, responding to emergencies etc. The objective are further,</p> <p>To put theory into practice.</p> <p>To expand thinking and broaden the knowledge and skills acquired through course work in the field.</p> <p>To relate to, interact with, and learn from current professionals in the field.</p> <p>To gain a greater understanding of the duties and responsibilities of a professional.</p> <p>To understand and adhere to professional standards in the field.</p> <p>To gain insight to professional communication including meetings, memos, reading, writing, public speaking, research, client interaction, input of ideas, and confidentiality.</p> <p>To identify personal strengths and weaknesses.</p> <p>To develop the initiative and motivation to be a self-starter and work independently. ■</p>			
<p>Internship/Professional practice: Students under the guidance of internal guide/s and external guide shall take part in all the activities regularly to acquire as much knowledge as possible without causing any inconvenience at the place of internship.</p> <p>Seminar: Each student, is required to</p> <ul style="list-style-type: none"> • Present the seminar on the internship orally and/or through power point slides. • Answer the queries and involve in debate/discussion. • Submit the report duly certified by the external guide. • The participants shall take part in discussion to foster friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident. ■ 			
<p>Course outcomes:</p> <p>At the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Gain practical experience within industry in which the internship is done. • Acquire knowledge of the industry in which the internship is done. • Apply knowledge and skills learned to classroomwork. • Develop a greater understanding about career options while more clearly defining personal career goals. • Experience the activities and functions of professionals. • Develop and refine oral and written communications skills. • Identify areas for future knowledge and skill development. • Expand intellectual capacity, credibility, judgment, intuition. • Acquire the knowledge of administration, marketing, finance and economics. ■ 			

Continuous Internal Evaluation

CIE marks for the Internship/Professional practice report (20 marks), seminar (10 marks) and question and answer session (10 marks) shall be awarded (based on the quality of report and presentation skill, participation in the question and answer session by the student) by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three faculty from the department with

Semester End Examination

SEE marks for the internship report (30 marks), seminar (20 marks) and question and answer session (10 marks) shall be awarded (based on the quality of report and presentation skill, participation in the question and answer session) by the examiners appointed by the University. ■

PROJECT WORK PHASE -2			
Course Code	20MEM41	CIE Marks	40
Number of contact Hours/Week	4	SEE Marks	60
Credits	20	Exam Hours	03
<p>Course objectives:</p> <ul style="list-style-type: none"> • To support independent learning. • To guide to select and utilize adequate information from varied resources maintaining ethics. • To guide to organize the work in the appropriate manner and present information (acknowledging the sources) clearly. • To develop interactive, communication, organisation, time management, and presentation skills. • To impart flexibility and adaptability. • To inspire independent and team working. • To expand intellectual capacity, credibility, judgement, intuition. • To adhere to punctuality, setting and meeting deadlines. • To instil responsibilities to oneself and others. • To train students to present the topic of project work in a seminar without any fear, face audience confidently, enhance communication skill, involve in group discussion to present and exchange ideas. ■ 			
<p>Project Work Phase - II: Each student of the project batch shall involve in carrying out the project work jointly in constant consultation with internal guide, co-guide, and external guide and prepare the project report as per the norms avoiding plagiarism. ■</p>			
<p>Course outcomes:</p> <p>At the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Present the project and be able to defend it. • Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task. • Habituated to critical thinking and use problem solving skills • Communicate effectively and to present ideas clearly and coherently in both the written and oral forms. • Work in a team to achieve common goal. • Learn on their own, reflect on their learning and take appropriate actions to improve it. ■ 			
<p>Continuous Internal Evaluation:</p> <p>Project Report: 20 marks. The basis for awarding the marks shall be the involvement of the student in the project and in the preparation of project report. To be awarded by the internal guide in consultation with external guide if any.</p> <p>Project Presentation: 10 marks.</p> <p>The Project Presentation marks of the Project Work Phase -II shall be awarded by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three faculty from the department with the senior most acting as the Chairperson.</p> <p>Question and Answer: 10 marks.</p> <p>The student shall be evaluated based on the ability in the Question and Answer session for 10 marks.</p> <p>Semester End Examination</p> <p>SEE marks for the project report (30 marks), seminar (20 marks) and question and answer session (10 marks) shall be awarded (based on the quality of report and presentation skill, participation in the question and answer session) by the examiners appointed by the University. ■</p>			



