M.TECH ME -(INDUSTRIAL ENGG)
(REGULAR)

SEMESTER I

Subject code	Name of Subject	TEACHING PERIODS			Credit Points
		L	T	P	
01MIE 101	Quantitative Methods and Operations Research	4	1	0	5
01MIE 102	Research Methodology	4	1	0	5
01MIE 103	Operations Management	4	1	0	5
01MIE 104	Simulation of Industrial Systems	4	1	0	5
01MIE 105	Methods Engineering and Ergonomics	4	1	0	5
01MIE 201	Lab I	0	0	3	2
01MIE 301	Discipline & Extra Curricular Activities	0	0	4	1
	Total	20	5	7	28

SEMESTER II

Subject code	Name of Subject	TEACHING PERIODS			Credit Points
		L	T	P	
02MIE 101	Supply Chain Management	4	1	0	5
02MIE 102	Production and Inventory Control	4	1	0	5
02MIE 103	Industrial Psychology	4	1	0	5
02MIE 104	Materials Management	4	1	0	5
02MIE 105	Management Information System	4	1	0	5
02MIE 201	LAB II	0	0	3	2
02MIE 301	Discipline & Extra Curricular Activities	0	0	4	1

	Total	**15**	**5**	**7**	**28**

SEMESTER III

Subject code	Name of Subject	TEACHING PERIODS			Credit Points
		L	T	P	
03MIE 101	Value Engineering	4	1	0	5
03MIE 102	Safety engineering	4	1	0	5
03MIE 201	Project	4	0	0	4
03MIE 202	Seminar	3	0	0	3
03MIE 301	Discipline & Extra Curricular Activities	0	0	4	1
	Total	15	2	4	18

SEMESTER IV

Subject code	Name of Subject	TEACHING PERIODS			Credit Points
		L	T	P	
04MIE 201	Dissertation a) Continuous Evaluation b) Project Report c) Viva Voice	 5 6 6			 5 6 6
04MIE 301	Discipline & Extra Curricular Activities			4	1
	Total	17		4	18

QUANTITAVIE METHODS AND OPERATIONS RESEARCH

COURSE/PAPER 01 MIE 101
MIE I SEMESTER

.

Role of quantitative methods in decision making. Probability and decision making, decision making under uncertainty, the value of additional information, Bay's theorem. Probability models and decision making. Sample survey methods. Methods of measuring and forecasting business changes, index numbers, time series analysis. Markov Analysis.

Background of Operations Research, classification of problems in operations research, phases of operations research study. Linear programming, formulation of mathematical models, solution of linear programming problems involving design of product mix, resource allocation, transportation and assignment by graphical, simplex and dual simplex methods, Duality theorem and applications, use of computer to solve linear programming problems.

Dynamic programming, principles of optimality, characteristics of dynamic programming problem, deterministic programming models for solution of investment problem, allocation problem, production scheduling and equipment replacement problem, probabilistic dynamic programming. Games theory, mini max - minimum pure strategies, mixed strategies and expected pay off, solution of 2x2, 2xn, mx2 games, Brown's algorithm.

Queuing theory notation and assumptions, Poisson's queuing models, non- Poisson queuing models, queues in series, queuing decision models, Application to scheduling and maintenance problems.

Reference

1. Quantitative Techniques Vohra, N.D Tata McGraw Hill 1995 in Management
2. Principles of Operations Research Wagner H.M Prentice Hall 1982
3. Operations Research Hira D.S & Gupta S. Chand & Co. 1995P.K
4. Operations Research Taha, H.A Macmillan Pub. Co. 1972
5. Quantitative Methods and Ahuja, K.K Kalyani Publisher 1990
6. Operations Research for Gopikuttan, G. Himalya Publishers 1994
7. Business and Economics

RESEARCH METHODOLOGY

COURSE/PAPER 01 MIE 102
MIE I SEMESTER

.Nature and objectives of research. Methods of Research: historical, descriptive and experimental Alternative approaches to the study of the research problem and problem formulation. Formulation of hypotheses, Feasibility, preparation and presentation of research proposal

Introduction to statistical analysis : Probability and probability distributions; binomial, Poisson, exponential and normal distributions and their applications.

Sampling: Primary and secondary data, their collection and validation, methods of sampling: Simple random sampling, stratified random sampling and systematic sampling, Attitude Measurement land Scales: Issues, Scaling of attitude, deterministic attitudes, measurement models, summative models, multi dimensional scaling.

Regression and correlation analysis. Tests of significance based on normal., t and chisquare distributions. Analysis of variance.

Basic Principles of design of experiments, completely randomized and randomized block designs.

Reference

1. C.R Kothari, Research Methodology, Wishwa Prakashan
2. P.G Triphati, Research Methodology, Sultan Chand & Sons, N.Delhi
3. Fisher, Design of Experiments, Hafner
4. Sadhu Singh, Research Methodology in Social Sciences, Himalya Publishers

65. Stoufferetal, Measurement & Prediction, Wiley, N.York
6. J.W Bames, Statistical Analysis for Engineers & Scientists, McGraw Hill, N.York
7. Donald Cooper, Business Research Methods, Tata McGraw Hill, N.Delh

OPERATIONS MANAGEMENT

COURSE/PAPER 01 MIE 103
MIE I SEMESTER

Production functions, work and job design, facilities planning, product and process selection, facilities location, facilities layout and materials handling, capacity planning, production planning and control for different types of manufacturing systems,
Planning and control of projects, maintenance management, value engineering, quality assurance and quality circles. Purchase system and purchase principles, inventory management, stores management, standardization, codification and variety, waste management.

Reference

1. Production and Operation Management Chunawala Patel Himalya Publishers 1995
2. Production and Materials Management Bhagde, S.D U.S.G Publishers 1995
3. Production and Inventory Control Plossl, G.W & Prentice Hall 1967 Wight, O.W

SIMULATION OF INDUSTRIAL SYSTEMS

COURSE/PAPER 01 MIE 104
MIE I SEMESTER

.

Unit1. Introduction and overview, concept of system, system environment, elements of system, system modeling, types of models, Monte Carlo method, system simulation – a management laboratory, advantages & limitations of system simulation, continuous and discrete system.
Unit 2. Simulation of continuous system: Characteristics of a continuous system, comparison of numerical integration with continuous simulation system. Simulation of an integration formation.
Unit 3. Simulation of queuing system: Concept of queuing theory, characteristics of queues, stationary and time dependent queues, queue discipline, time series analysis, measure of system performance, Kendal's notation, auto covariance and auto correlation function, auto correlation effects in queuing system, simulation of single server queues, multi server queues, queues involving complex arrivals and service times with blanking and reneging.
Unit 4. Simulation of inventory systems: Rudiments of inventory theory, MRP, in process inventory. Necessity of simulation in inventory problems, forecasting and regression analysis, forecasting through simulation, generation of Poisson and Erlang variates, simulation of complex inventory situations.
Unit5. Simulation Languages: Continuous and discrete simulation languages, block structures continuous languages, special purpose simulation languages, SIMSCRIPT, GPSS SIMULA importance and limitations of special purpose languages.

Reference

Simulation and Modeling Loffict Tata Mcgraw Hill
System Simulation with Digital Deo Narshing Prantice Hall
Computer
System Simulation Hira, D.S S.Chand & Co.
Computer Simulation and Meeiamkavil John Willey
Modeling
System Simulation Gerden Prentice Hall

METHODS ENGINEERING AND EROGONOMICS

COURSE/PAPER 01 MIE 105
MIE I SEMESTER

Introduction to Industrial Engineering and productivity, measurement of productivity. Introduction to work study, methods study principles and motion economy, design cycle, filming techniques and micro motion analysis, recording techniques,
Introduction to work measurement, time study, performance allowances, work sampling, predetermined motion systems, job evaluation and merit ration, wage incentive plans, methods time measurement.
Introduction to ergonomics, man/machine/environment systems concept, development of ergonomics.
Design approach: A new design, modification of existing design, assessment of a design, limitations of man & machine with respect to each other, Posture – standing at work, seated at work, work station heights and seat geometry. Human anthropometry and its use in work place layout.
Controls: Hand controls and foot controls, location of controls and work place envelope, recommendation about hand and foot push buttons, rotary selector switches, hand wheels, cranks, levers etc. instruments and displays.
Climates: (a) Heat Humidity – Body heat balance, effective temperature scales, zones of discomfort, effect of heat on body and work performance.
(b) Vibrations: Technology, response of body to low frequency vibrations, vibrations and discomfort, effect on health of worker, high frequency vibrations, effect of high frequency vibrations, methods of reducing vibrations.
(c) Noise: Terminology, physiological effects of noise, annoyance of noise, speed interference, hearing loss, temporary and permanent threshold shift, effect of noise on performance, reduction of noise, personal noise protection.

Reference

1. Methods Engineering Study Krick, E.V
2. Work Study and Ergonomics Shan, H.S Dhanpat Rai & Sons 1992
3. Introduction to Ergonomics Bridger Tata McGraw Hill 1995
4. Work Study Khanna, O.P Dhanpat Rai & Sons 1995
5. Sound, Noise and Vibration Control Lyle, F. Yerges Van Nostrand 1978

LAB-I

COURSE/PAPER 01 MIE 201
MIE I SEMESTER

One lab /field/industrial oriented project /problem will be allocated to each student related to the subjects related to the subjects taught in 1st semester.

SUPPLY CHAIN MANAGEMENT

COURSE/PAPER 02 MIE 101
MIE II SEMESTER

Introduction: Objectives of supply chain Management, key components of supply chain i.e. sourcing, distribution strategy, customer service strategy; supply chain Management as Integrated logistics, generic activities, architecture of supply chain, future potential of supply chain Management.
Corporate Profitability: Link to supply chain, evaluation of SCM strategies, customer focus in SCM, inventory and logistic Management, vendor Management, justin- time (JIT).
Quality Management: Inherent link to SCM: Suppliers development, distribution channel, re-engineering of supply chain, IT – enabled supply chain: Electronic data interchange, enterprise resource planning, implementation of IT, Scope of emerging distributed cooperative tele manufacturing over internet.
Organizational Issues: Application of knowledge Management for effectiveness SCM, social interactions and linking of functional units in a supply chain, Combined core competency of SC : Global sourcing, technology and tools – essential enablers,
Framework for managing a knowledge intensive supply chian.Recent Trends in SCM: Tierisation of supplies, Reverse logistics, JIT II, MilkRound System (MRS), bar coding, Hub and Spoke Concept and other latest concepts.

Reference

1. Chopra, Supply Chain Management, Pearson Education Asia, New Delhi
2. Christopher, Logistics and Supply Chain Management, 2/E, Pearson EducationAsia, New Delhi
3. Taylor & Brunt, Manufacturing Operations and Supply Chain Management (TheLean Approach), Business Press Thomson Learning N.Youk.Arjan J. Van Weele,

4. Purchasing and Supply Chain Management (Analysis Planning and Practice), 2/Engineering, Business Press, Thomson Learning N.Youk.
5. Donalad Bowersox, Logistic Management - The Integrated Supply Chain process, McGraw Hill, N.York

PRODUCTION AND INVENTORY CONTROL

COURSE/PAPER 02 MIE 102
MIE II SEMESTER

.
Production systems, Types & Characteristic features, analysis of production system:
Objective approaches, Demand forecasting, horizons, techniques and applications: production planning, capacity planning, aggregate planning, master production scheduling, MPR, MRP II, concept of ERP and supply chain management; production control, functions information requirements, modern developments in Production and operations management, inventory control, deterministic and stochastic models, relationship with production control, computer application in Production and Inventory
Control.

Reference

1. Krejewski, Operations Management, Pearson Education Asia, New Delhi
2. Chase, Aquilano & Jacob, Production/Operations Management, Tata McGrawHill, New Delhi
3. Martinich, Operations Management, John Wiley & Sons, New York
4. Simuel Eilon, Production and Planning & Control, Wiley. New York
5. Steven Nahimas, Production & Operations Analysis, McGraw Hill, N.York
6. H.B Maynard Associates, Industrial Engineering (Handbook), Prentice Hall,N.York.
7. Ebert and Adams, Production/ Operations Management, Prentice Hall of India, N.Delhi

INDUSTIRAL PSYCHOLOGY

COURSE/PAPER 02 MIE 103
MIE II SEMESTER

.
Introduction: Definition, nature and development of work psychology, methods of research, basis of job related behaviour - individual and situational variables. Individual and their evaluation, role of heredity, environment, types of individual.
Psychological tests in industries, their utility, reliability and validity
Human Engineering: Job Methods, Time study, Fatigue, Work Environment, Accidents and safety.
Motivation and frustration; Work motivation, Theories (contents and cognitive) and applied implication incentives, moral, job satisfaction.
Frustration symptoms and coping strategies.
Attitudes and Conflicts: Definition, sectors, influencing attitude measurement and attitude change. Conflict, nature, level and its sources.
Work stress and metal health: Stress and stressors, sectors, pre-disposing and individual to stress and cost of work stress – general principals of coping with stress, individual and organizational strategies in stress management Counseling. Job Redesign and new technologies: Human factor approach to job design, man machine system, work methods, control, play, linkages, work space envelops. Jobs simplification, job enrichment, job enlargement.
New Technology – introduction and its implications for the organization.

Reference

1. Work Psychology – Understanding Behaviour at work by John Earnold, Robertson and Cooper
2. Industrial Psychology by Tiffin and Meccormic
3. Social Psychology of Organization Behaviour by Katz and Kahn
4. Handbook of Industrial Psychology Porter and Lawler
5. Industrial Psychology by Ghosh and Ghorpede

MATERIALS MANAGEMENT

COURSE/PAPER 02 MIE 104
MIE IISEMESTER

.
Scope and importance of materials and inventory Management, Functions and objectives of material Management, Suppliers and purchasing function,
Purchasing objectives and procedures, Quality considerations in purchasing, Receiving and shipping, The receiving functions and shipping systems.
Traffic and physical distribution: Classifying inventory problems, Number of items, nature of demand, number of times period, lead time, stock outs, inventory costs, inventory management systems. ABC inventory analysis: Control system for independent demands, Cycle counting, decision models for inventory Management, Economic order quantity (EOQ) model,
Determining an inventory policy for EOQ model, Economic production lot size model, An inventory model with planned shortages, Lot sizing for dynamic demand, Periodic order quantity, para period balancing, service levels and uncertainty in demand, Single period inventory models, simulation models for inventory analysis.

Reference

1. Production and materials Management Bhagde, S.D USG pub.
2. Production and inventory control Plossl, G.W & Wright, O.W Prentice Hall
3. Purchasing Management Lee Lamber

MANAGEMENT INFORMATION SYSTEM

COURSE/PAPER 02 MIE 105
MIE II SEMESTER

.
Information & System Concepts-Introduction --Concepts, Classification of Information, Methods of Data & Information Collection, Value of Information, Organization and Information, System: A Definition. Types of Systems, System Decomposition, Integration of Sub Systems, Elements of a System, Human as an Information Processing System. International Business and IT.

Management Information System-MIS: Definition, Nature & Scope, MIS Characteristics, Functions, Structure of MIS, Role of MIS, MIS as a Control System, Process of Management, Application of MIS, ERP & IT's Benefits.

New Information Technology: Interconnection and networking, Multimedia, Neural Networks, Artificial Intelligence, Executive Information System, Decision Support System (DSS) and Expert Systems.

Issues for Senior Management: Management Control, Management Issues, Security Issues: Viruses, Worms and other creatures, I T issues for Management, Management in a Technological Environment, the changing world of Information.

References:

1. Computer Fundamental Concepts & system, P. K. Sinha, BPB PUB. N.D.
2. Management Information System, Jawadekar, macgraw Hill, N.D.
3. Management Information System, Lucas, macgraw Hill, N.D.
4. Management Information System, Davis, TMH
5. Information System Solutions: A Project Approach, Van Horne.TMH
6. Management Information System , O'Brien, TMH
7. Management Information System, Haag, TMH.
8. Managemnet Information System, James O' Brain, Tata McGrawHill.
9. Managemnet Information System, Dharminder Kumar/Sunita, Excel Books, Delhi.
10. Managing With Information, Jerome Kanter, Prentise Hall Of India.

11. Management Information System: managing the digital firm, laudon & laudon, pearson education.
12. Information system for modern management, Murdick, Ross & Clagget, Prentice hall/pearson
13. Business Information System, Muneesh Kumar, Vikas Publishing house.

LAB-II

COURSE/PAPER 02 MIE 201
MIE II SEMESTER
One lab /field/industrial oriented project /problem will be allocated to each student related to the subjects related to the subjects taught in 2nd semester.

VALUE ENGINEERING

COURSE/PAPER 03 MIE 101
MIE III SEMESTER

Concept of value, cost and price, customer and value, philosophy and objectives of value analysis, types of value, areas of application of value engineering, limitations of value analysis, difference between value engineering and cost reduction techniques; Tool of technology in value analysis, method & engineering, cause and effect diagram, SWOT analysis, break even analysis, system approach; Job plan for value analysis approach: Information Phase, Function Phase, Creation Phase, Evaluation Phase, Recommendation Phase, Implementation Phase, Audit Phase; Value Engineering Cell, Value Manual, composition of cell, cost cutting, various cost cutting techniques; Case studies in value engineering and analysis from manufacturing and service industries.

Reference

1. Mudge, Value Engineering, SAVE, N.York
2. Miles Lawerence, Techniques of value analysis and value engineering, McGraw Hill, N.York
3. ASME, Value Engineering in Manufacturing, Prentice Hall India, N.Delhi
4. Getting More at less Cost Value Engg. Tata McGraw Hill, N.Delhi
5. Parker, D.E. Value Engg. Theory, L.D. Miles Value Foundation, N.York

SAFETY ENGINEERING

COURSE/PAPER 03 MIE 102
MIE III SEMESTER

General Industrial work environment and its implications with regard to safety of operators and equipment, safety concepts, safety as essential parameter in the design of industrial of industrial production systems, organization of safety. Hazards, their nature, consequences and classifications. Hazards analysis techniques, Hazard prevention strat6egies and measures, accident cost and the assessment;

System safety concept. Safety engineering analysis, safety factors in opea5tion and maintenance of plant and equipment, strategic for risk reduction, safety considerations with regard to handling of hand tools, machine tools pressure vessels, pipes, electric lines and fire, types of fire, fire prevention and strategies.

Safety measures. Standards and programs, measuring safety performance, contribution of ergonomics to operator and plant safety, contribution of safety engineering to plant productivity industrial safety acts, dangerous machines act and B.I.S codes on Machinery guarding. Relevant clauses of Indian Boiler Regulations in reference to safety.

Reference

1. Product Safety Engineering for Managers Seident.R
2. Industrial Safety-Management and Technology Colling D
3. Hand Book of Industrial Health Engineering
4. Occupational safety and Health Antom Management State Safety regulations
5.

PROJECT WORK

Course/Paper: 03MIE-201

MPE Semester-III

OBJECTIVE

The objective of the project work is to enable the students in convenient groups of not more than 3 members on a project involving theoretical and experimental studies related to the branch of study. Every project work shall have a guide who is the member of the faculty of the institution.
The student should select any one of the topics offered from the department or select one on his own duly approved from the department. Candidate is required to submit the detailed synopsis of the work that he would complete in the part-II

Each student shall finally produce a comprehensive report covering back ground information, literature survey, problem statement, project work details and conclusion. This final report shall be typewritten form as specified in the guidelines.

SEMINAR

OBJECTIVE

Course/Paper: 03MIE-202
MPE Semester-III

The students are to select one technical topic related its branch for Seminar. The student is to submit the synopsis for assessment and approval. Progress for preparation of the seminar topic would be continuously assessed from time to time. Two periods per week are to be allotted and students are expected to present the seminar Progress. A faculty guide is to be allotted and he / she will guide and monitor the progress of the student and maintain the attendance.
Students have to give a final presentation for 15 minutes on his topic. Students are encouraged to use various teaching aids such as over head projectors, power point presentation and demonstrative models. This will enable them to gain confidence in facing the placement interviews

SEMESTER IV

DISSERTATION

Course/Paper: 04MIE 201PT

MIE Semester IV

The student will submit a synopsis at the beginning of the semester for the approval from

the University project committee in a specified format. Synopsis must be submitted within a

Two weeks. The first defense, for the dissertation work, should be held with in a one

month. Dissertation Report must be submitted in a specified format to the University for

Evaluation purpose.