Course contents

Category	Title	Code	Credits-		Theory Papers
BS1	ADVANCED MATHEMATICS	MMPD/MMCM /MMIE/MMTH-101	L	P	Max. Marks-100
			3	-	Min. Marks-40
					Duration: 3 hrs.

UNIT 1
Linear Algebra: Linear transformation, vector spaces, hash function, Hermite polynomial, Heavisite's unit function and error function. Elementary concepts of Modular mathematics

UNIT 2
Solution of Partial Differential Equation (PDE) by separation of variable method, numerical solution of PDE (Laplace, Poisson's, Parabolic) using finite difference methods, Elementary properties of FT, DFT, WFT, Wavelet transform, Haar transform.

UNIT 3
Probability, compound probability and discrete random variable, Binomial, Normal and Poisson's distributions, Sampling distribution, elementary concept of estimation and theory of hypothesis, recurred relations.

UNIT 4
Stochastic process, Markov process transition probability transition probability matrix, just and higher order Markov process, Application of Eigen value problems in Markov Process, Markov chain. Queuing system, transient and steady state, traffic intensity, distribution queuing system, concepts of queuing models (M/M/1: Infinity/ Infinity/ FC FS), (M/M/1: N/ Infinity/ FC FS), (M/M/S: Infinity/ Infinity/ FC FS)

UNIT 5
FEM: Variational functionals, Euler Lagrange's equation, Variational forms, Ritz method, Galerkin's method, descretization, finite elements method for one dimensional problem.

Reference Books:
1. Higher Engineering Mathematics by B.V. Ramana, Tata Mc Hill.
2. Advance Engineering Mathematics by Ervin Kreszig, Wiley Easten Edd.
3. Applied Numerical Methods with MATLAB by Steven C Chapra, TMH.
4. Introductory Methods of Numerical Analysis by S.S. Shastry,
5. Introduction of Numerical Analysis by Forberg
6. Numerical Solution of Differential Equation by M. K. Jain
7. Numerical Mathematical Analysis By James B. Scarborogh
8. Fourier Transforms by J. N. Sheddon
9. Advance Mathematics for Engr and Sc, Spiegel, Schaum Series, TMH

Course contents

Category	Title	Code	Credits-		Theory Papers
DC	WORK STUDY AND PRODUCTIVITY MANAGEMENT	MMIE-102	L	P	Max. Marks-100
			3	-	Min. Marks-40
					Duration: 3 hrs.

Unit 1 Productivity Management: Concept of Productivity, Factors affecting Productivity, Total productivity model. Short term and Long term Productivity Planning Models. Productivity improvement Techniques: Technology based, Material based, Employee based, Product and Time based P.I. Techniques, Work Study: Definition, objectives and areas of application of work study in industries, Historical review,; Human aspects of work-study, Role of work-study in productivity improvement

Unit 2 Interrelation between method study and work measurement, Method Study: Definition and objectives; Engineering approach to methods analysis and improvement, Data collection and recording techniques; critical examination and development, creative thinking, tools of creativity, Installation and maintenance of the new improved methods. Motion Economy and Analysis: Principles of motion economy, motion analysis; Micro motion and memo motion study; Therbligs and Simo charts

Unit 3 Work Measurement: Definition and objectives; work measurement techniques, Stop watch time study, Principles and procedures, Systems of performance rating; calculation of basic time, allowances and standard time, predetermined motion time and other standard systems, introduction to MOST, Work Sampling : principles and techniques, application of work sampling studies.

Unit 4 Introduction to Ergonomics: Ergonomics as a multi-disciplinary field, components, Importance of ergonomics in equipment and work design, Concept of man-machine system; Types and characteristics of Man-machine systems, Rest Pause design based on physiological consideration, Anthropometry and Work place design.

Unit 5 Wage Incentives and Job Evaluation: Various types of wage Incentive schemes and their impact on productivity, Comparison of different incentive plans, design of incentive plans, Group system of Wage payment, Supervisory incentive plans. Job Evaluation: Purpose, Various types of jobs evaluation system and their application of classification. Wage Cure, Designing salary structure and Grade, Merit Rating, Performance Appraisal.

Case Studies.

References:

1. Sumanth D.J., Productivity Management, TMH.
2. I.L.O., Introduction of Work Study, ILO
3. Maynard H.B., Industrial Engineering Hand Book.
4. Jhamb L.C., Workstudy and Ergonomics.

Course contents

Category	Title	Code	Credits-		Theory Papers
DC	PRINCIPLES AND PRACTICES OF MANAGEMENT	MMIE-103	L	P	Max. Marks-100
			3	-	Min. Marks-40
					Duration: 3 hrs.

Unit 1 Introduction: Definition, Roles and Functions of a Manager, Schools of Management Thought, Comparison of American, Japanese and Indian Philosophies of Management, Importance and relation between planning and control, why planning is difficult, types of plans, Objectives of business, Decision-Making, Policy Formulation and Strategies, Management by Objectives.

Unit 2 Organization: Nature and Purpose of Organizing, size ,complexity, centralization and formalization, Departmentation, Organization Structures, line, staff and matrix organizations, formal and informal organizations, Span of Control, Delegation of Authority.

Unit 3 Staffing: Functions of Personnel Managment, Manpower Planning, Selection and Recruitment, Methods & Types of Training, Motivation, Maslow's need hierarchy, role of money, reduction in hierarchy levels, Herzberg hygienic and motivating factors, Leadership Theories, characteristic and styles of leaderships, Performance Appraisal.

Unit 4 Control: Meaning, Process and Evaluations, effectiveness and efficiency controls, feed forward (push) and feedback (pull) controls, Developing and compensating employees, Control Methods, Effective Communication.

Unit 5 Understanding Organization Behavior, O B model, Hawthorne studies, Foundations of Individual & Group behavior, Introduction to HRD: Importance & Need of HRD, HRD processes & mechanisms, Planning & organizing HRD, OCTAPAC, KAIZEN, HRIS. TQM.
Case Studies.

References:

1) Koontz -O'Donnell, Essentials of Management; TMH
2) Bhat Anil and Arya k; Management principles processes and practices; Oxford university P.
3) Daft; The new era of management; Cengage pub.
4) Robbins and Coulter; Management; PHI
5) Stoner, Freeman, Gilbert; Management; PHI
6) Chhabra T.N., Principles and Practice of Managment.
7) Murton- Gulab, Management Today.
8) Prasad L.M., Principles and Practice of Management
9) Stoner- Philips, Management.
10) Terry G.R., Principles of Management.

Course contents

Category	Title	Code	Credits-		Theory Papers
DID	QUANTITATIVE TECHNIQUES IN MANAGEMENT	MMIE-104	L	P	Max. Marks-100
			3	-	Min. Marks-40
					Duration: 3 hrs.

Unit 1 Introduction: History and Development of O.R. & Linear Programming, Present Trend, Assignment models, Transportation: Optimality Test, Degeneracy unbalanced Problems, Transshipment.

Unit 2 Linear Programming: Formulation, Graphical Method, Simplex Method, and Big - M Method, Two-phase Method, Degeneracy, and Unrestricted variables, Revised Simplex, Duality, and Sensitivity analysis, Introduction to Integer programming. Branch and Bound Method.

Unit 3 Waiting line models: Introduction, Classification, States in queue, Probability distribution of arrival and service times Birth and Death Process, Single Server Model (M/M/1), Multiple Server Model (M/M/S), Single Server Model with finite capacity.

Unit 4 Game Theory: Rectangular, Two persons, Zero Sum Games, Maximum and Minimax Principles, Saddle Point, Dominance, Graphical and Algebraic Methods of solution, transforming into Linear Programming Problem, Bidding Problems, Introduction to nonlinear and Dynamic Programming

Unit 5 Simulation: Building a Simulation Model, Monte-Carlo Simulation and Applications, Random No., characteristics and generation, pseudorandom nos., mapping to probability distributions, Simulation Software, applications, Decision under uncertainty, Tree diagram, probability trees, Decision tree, Computer Application in O.R. and Case Study.

References:

1. Taha H. Operation Research, PHI
2. Hillier F and Liberman G; Introduction to Operations research; TMH
3. Bronson Richard; Schaum's Outline of OR; TMH.
4. Philip, Ravindran, Operation Research, John Wiley.
5. Heera and Gupta, Operation Research, s. Chand.
6. Sharma S.D. Operation Research
7. Vohra N.D., Operation Research, TMH

Course contents

Category	Title	Code	Credits-		Theory Papers
DC	OPERATIONS MANAGEMENT	MMIE-105	L	P	Max. Marks-100
			3	-	Min. Marks-40
					Duration: 3 hrs.

Unit 1 Operations Management: Introduction, Systems concept, Decisions, Organization, Objectives and Evolution of Operations Management, comparing production of tangible goods and services, Operations Strategy, Type of Production Systems, Role of Production Manager.

Unit 2 Facilities Planning & Production Planning Control: Plant location, Plant layout and Material Handling, Layout analysis, Procedures such as CORELAP, CRAFT etc. Organization & Functions of PPC CAPP, Make or Buy Decision, Forecasting Methods & its relationship with Product Life Cycle, Case Studies.

Unit 3 Aggregate Planning and Master Scheduling: Strategies of Aggregate Planning, Graphic & and Charting methods, Application of LP, Master Scheduling, Job Shop Scheduling and Sequencing Algorithms Gantt Chart, Line Balancing, LOB, Case Studies.

Unit 4 Maintenance Management: Types of maintenance strategies, Breakdown, Preventive and Predictive maintenance, Individual and Group Replacement Policies, Case Studies.

Unit 5 Materials Management as part of supply chain, Purchasing, stores and vendor selection, Inventory Models, Selective Inventory Control, MRP, MRP-II, Lot size Techniques, Just - In - Time system of manufacturing, Kaizen, Total Productive Maintenance (TPM), BPR, SCM, ERP etc.& Case Studies.

References:

1. Hop W, Spearman M; Factory Physics; TMH
2. Charry S.N.; Production & Operations Management; TMH.
3. Chase, Acquilino, Production & Operations Managment, TMH.
4. Eilon S. Production Planning and Control, McMillon Pub.
5. Vollmann; Mfg planning and control for SCM; TMH
6. Nahmias Steven; Production and Operations analysis; TMH
7. Bedi Kaniska; Production and Operations Management; Oxford Pub
8. Dobler & Lee, Purchasing & Materials Management, PHI.
9. Chitle A.K., Gupta R.C. Materials Management, PHI.
10. Monk Joseph; Schaum's outline of Operations Management; McGraw Hill.

Course contents

Category	Title	Code	Credits-		Practicals
DC	LAB I INDUSTRIAL ENGG./ PRODUCTIVITY	MMIE-106	L	P	Max. Marks-100
				3	Min. Marks-50

PRACTICAL /LAB WORK / CASE STUDIES RELATED TO WORK STUDY & PRODUCTIVITY MANAGEMENT, INTRODUCTION TO MATLAB.

STUDENT IS REQUIRED TO SUBMIT A JOURNAL/REPORT FOR THE SAME.

List of Experiments to be expanded.

Course contents

Category	Title	Code	Credits-		Practicals
DC	LAB II OR/ OM	MMIE-107	L	P	Max. Marks-100
				3	Min. Marks-50

PRACTICAL /LAB WORK / CASE STUDIES RELATED TO QUANTITATIVE TECHNIQUES OF MANAGEMENT, SOLVING LPP ON LINGO-LINDO, USE OF TORA AND EXCEL. USE OF COMPUTER TO SOLVE LAYOUT AND OTHER OPERATIONS MANAGEMENT PROBLEMS

STUDENT IS REQUIRED TO SUBMIT A JOURNAL/REPORT FOR THE SAME

List of Experiments to be expanded.