

UNIVERSITY OF MUMBAI
No.UG. 30 of 2005

CIRCULAR:-

A reference is invited to the Ordinances and Regulations relating to the Master of Engineering (Production Engineering) with Industrial Engineering and Operation Research vide pamphlet No.190 and the Principals of the affiliated colleges in Engineering are hereby informed that the recommendation made by the Faculty of Technology at its meeting held on 9th November,2004 has been accepted by the Academic Council at its meeting held on 14th December,2004 vide item No.4.22 and that in accordance therewith the scheme and syllabus for the M.E. (Production Engineering) with Industrial Engineering and Operation Research is as per Appendix and that the same will be introduced with effect from the academic year 2005-2006.

MUMBAI-400 032

24th January, 2005

for REGISTRAR

To,

The Principals of the affiliated colleges in Engineering
AC/4.22/14.12.2004

No.UG/ 30-A of 2005, MUMBAI-400 032

24th January, 2005

Copy forwarded with compliments for information to :-

- 1) The Dean, Faculty of Technology
- 2) The Chairman, Board of Studies in various branches in Engineering

for REGISTRAR

Copy to :-

The Director, Board of College and University Development, the Deputy Registrar (Eligibility and Migration Section), the Director of Students Welfare, the Personal Assistants to the Vice-Chancellor, the Pro-Vice-Chancellor, the Registrar and the Assistant Registrar, Administrative sub-center, Ratnagiri for information.

The Officer on Special Duty-cum- Controller of Examinations (10 copies), the Finance and Accounts Officer (2 copies), Record Section (5 copies), Publications Section (5 copies), the Deputy Registrar, Enrolment, Eligibility and Migration Section (3 copies), the Deputy Registrar, Statistical Unit (2 copies), the Deputy Registrar (Accounts Section), Vidyanagari (2 copies), the Deputy Registrar, Affiliation Section (2 copies), the Director, Institute of Distance Education, (10 copies) the Director University Computer Center (IDE Building), Vidyanagari, (2 copies) the Deputy Registrar (Special Cell), the Deputy Registrar, (PRO), the Assistant Registrar, Academic Authorities Unit (2 copies) and the Assistant Registrar, Executive Authorities Unit (2 copies). They are requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to in the above Circular and that a separate Action Taken Report will be sent in this connection. the Assistant Registrar Constituent Colleges Unit (2 copies), BUCI (1 copy), the Deputy Account. Unit V (1 copy), the In-charge Director, Centralize Computing Facility (1 copy), the Receptionist (1 copy), the Telephone Operator (1 copy), the Secretary MUASA (1 copy), the Superintendent, Post-Graduate Section (2 copies), the Superintendent, Thesis Section (2 copies)

UNIVERSITY OF MUMBAI



Syllabus
for
M.E. (Production Engineering)
with
Industrial Engineering
and
Operations Research

(with effect from the academic year 2005–2006)

UNIVERSITY OF MUMBAI
SCHEME OF INSTRUCTION AND EVALUATION
COURSE: MASTER OF ENGINEERING
PRODUCTION ENGINEERING WITH INDUSTRIAL ENGINEERING
&
OPERATIONS RESEARCH

SEMESTER – I

Sr. No.	Subject	Lectures	Tutorial/ Practical	Duration of examination in Hr.	Theory paper (Marks)	Internal Assessment
1.	Manufacturing systems Engineering	3	2	4	100	50
2.	Operations research	3	2	4	100	50
3.	Advanced probability & statistics	3	2	4	100	50
4.	Industrial engineering & software applications	3	2	4	100	50
5.	Elective – I	3	2	4	100	50
	TOTAL	15	10	-	500	250

Elective –I

1. Facility planning & material handling
2. Low cost automation
3. ERP & management information systems

SEMESTER –II

Sr. No.	Subject	Lectures	Tutorial / Practical	Duration of examination in Hr.	Theory paper (Marks)	Internal Assessment
1.	Advanced operations research	3	2	4	100	50
2.	Purchasing & supply chain management	3	2	4	100	50
3.	Corporate finance & costing	3	2	4	100	50
4.	World class manufacturing system	3	2	4	100	50
5.	Elective – II	3	2	4	100	50
	TOTAL	15	10	-	500	250

Elective –II

1. Inventory planning & management systems
2. Entrepreneurship development
3. Organizational behaviors & personnel management

SEMESTER III

Sr. No.	Subjects	Internal Assessment
1	Seminar on thrust areas	50
2	Dissertation	50
	Total	100

SEMESTER IV

Sr. No	Subjects	Internal Assessment
1	Pre synopsis dissertation seminar	50
2	Dissertation and Viva Voce	50
	Total	100

ME		Semester -I	
Subject: Manufacturing Systems Engineering			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction:

Over view of various manufacturing systems and issues of interest, Job, batch, mass and continuous production systems, cellular manufacturing, JIT, FMS & CIM, Recent trends

Decision making in the design of manufacturing systems: Group Technology, line balancing, Plant location and layout; various techniques and algorithms.

Preplanning: Demand forecasting, opinion based, causal and time series demand forecasting techniques, Trend and seasonality models. Modern forecasting techniques. Winter forecasting model, double smoothing

Operation planning: Aggregate planning, capacity planning, MPS, MRP, MRP -II, ERP, JIT KANBAN systems, lot sizing decisions, scheduling of single machine, production scheduling for flow shop and job shop, line of balance.

Performance measurement & management: Importance, common measures, productivity techniques, such as VA / VE, work study, TPM TQM, BPR, Kaizen, process capabilities studies, six sigma, their impact on performance, case studies on the above mentionable areas.

TEXT BOOKS

1. Bedworth, D.D and Bailey J.E., Integrated Production Control System- Management, Analysis and Design. John Wiley, 1983.
2. King J.R., Production Planning and Control, Pergamon Press Oxford, 1975
3. Noori H and Radford R, Production and operations Management, McGraw Hill Inc., 1995
4. Nahmias S, Production and operations Analysis, Irwin, 1997
5. Chase R.B, Aquilano N.J. and Jacobs F.R. , Production and operations management- Manufacturing and Services, Tata McGraw Hill, Second Edition, 1999
6. manufacturing system engineering viva students edition .New Delhi

ME			Semester -I
Subject: Operations Research			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction: Decision variable, parameters, objective function, constraints or restrictions, optimality, infinite solution, unbounded solution, infeasible, degenerate, basic variable, non basic variable.

Linear Programming: Formulation, Graphical solution, simplex method, Two phase, Big -M, Duality, Dual simplex, Graphical sensitivity analysis (changes in objective function coefficient & unit work of resources)

Network analysis: Transportation, Assignments, sales man problem, shortest route problem, and Minimal spanning tree problem.

Integer programming: Branch & bound technique. Problem restricted to two-decision variable.

Inventory: Deterministic model, P & Q. System, EOQ with shortage, EOQ with price break, EOQ with resources constraint.

Simulation: Monte Carlo simulation, Types of simulation, Generation of Random numbers.

Queuing model: Elements of queuing model, single server model with Poisson input and exponential service (M/ M /1)

Game theory: Pure & mixed strategies, saddle point, graphical method, dominance property, and Method of Matrices, linear programming methods.

TEXT BOOKS

1. Operations research by R.Panneerselvam; Prentice Hall of India Pvt.LTD..
2. Quantitative technique by N.D.Vohra ; Tata McGraw Hill Published co.Ltd.
3. Operations research by an introduction; Hamdy A. Taha Macmillan
4. Principal of operations Research by Harvery M.Wagner, Prentice Hall
5. Optimization by S.S.Rao; New age international (P) Ltd.
6. Operations research by Rvindrarn,Philips,Solberg. John Wiely & Sons
7. Introduction to operations research by Billy E.Gillett ;Tata McGraw Hill edition

ME		Semester -I	
Subject: Advanced Probability & Statistics			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction:

- 1. Probability:** sample space and events, conditional probabilities, independent events, Bayes theorem
- 2. Random variables and probability distributions:** Discrete, (Bernoulli's, Binomial, Geometric & Poisson), continuous (Weibull Chi-square t distribution and F-distribution, uniform, exponential and normal) Expectation of random variable. Jointly distributed random variables, moment generating function and introduction of stochastic process.
- 3. Inferential statistics:** Estimation of parameters, Test of hypothesis, Analysis of variance (ANOVA) and analysis of co-variance (ANACOVA), correlation and regression analysis, multiple-regression, Design of experiments, RBD, Latin square
- 4. Multivariate analysis:** Principal component analysis (exploratory and confirmatory) Introduction to structural equation modeling Introduction to statistical packages.
- 5. Markov chains:** introduction, Chapman-Kolmogorov equations, classification of states, limiting probabilities, gamblers ruin and random walk, mean time spent in transient states, introduction to continuous time Markov chains.

TEXT BOOKS

1. Probability, Random Variables and stochastic processes; Athanasios Papoulis 2ND Edition McGraw Hill 1984
2. Introduction to probability models 2nd Edition Sheldon M. Ross; Harcourt India Pvt Ltd. 2001
3. Probability and statistics for engineers and scientists; Sixth ed. Walpole, Myers PHI
4. Mathematical statistics; Freund, 5th Ed. PHI
5. Probability and statistics with reliability Queuing and computer science application; Trivedi, PHI
6. using multivariate statistics: Barba .G. Tabachnick / Linda Fidell Harper International ed. 1983- New York

ME			Semester -I
Subject: Industrial & Engineering and Software Applications			
Period / Week 1 period of 1 hour		Lecture	3
		Tutorial	2
Evaluation system		Hours	Marks.
	Theory	4	100
	Internal assessment	-	50

Industrial Engineering:

Methods engineering; over view- its impact on productivity, problem solving approach –definition stage analysis – search –evaluation – recommendations for action.

Methods study approach v/s value engineering approach – Methodology of method study –select –record –analysis – develop-install- maintain, various recording tools and charts-cycle graph – chrono cycle graph –micro motion and memo motion study.

Ergonomics and human factors in engineering, worker selection and training – job evaluation – human learning – learning curve methodology, Industrial Psychology.

Work measurement; objective and scope – different techniques of work measurement.

Time study –work sampling –standards data systems

Analytical estimation. Various rating techniques –their scope and limitation- introduction to P.M.T. system like work factor system, MOST.

Industrial Engineering software

Introduction, system analysis and Design, Management information System, Decision support systems, decision making under certainty, risk uncertainty and analytical tools for problem solving

Tools for determining system requirement, decision trees, and computer aided system tools

Design of files and use of auxiliary storage devices, data structures, backup and recovery of files, design of data base interaction and relationships

Design of data communication, communication systems, channels, networks, communication protocols, intranets and Internet, Hardware and software selection, size and capacity requirement, evaluation of software

Introduction to application soft ware in IE & OR, exposure to software packages like TORA,LINDO, LINGO, SPSS, and SAS. Introduction to relevant software packages in the area of work-study, plant layout, assembly line balancing, CPM / PERT etc.

TEXT BOOKS

1. Work study by international Labour office Geneva
2. Time and motion study by Ralph Barnes Asia Pub, 1996
3. Introduction to ergonomics by R.S.Bridger ;MaGraw Hill, 1995
4. Analysis and Design of Information System: James A. Senn: Int Ed(II): McGraw Hill Pub. 1989.
5. Management Information System – Startegy and Action: Charles Parker and Thomas case : 2nd Ed.' 1993, Indian Ed. Mitchall McGraw Hill , N.Y.
7. Management Information system: David Kronke: McGraw Hill 1989.
8. Introduction to System Design : Vol .I & II , Nat. Comp.Cent. UK Galgotia Booksource, 1979.

ME			Semester -I
Subject: Facility Planning and Material Handling			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction, overview, facility location problem, application of various analytical approaches, single / multiple facility location problems, Discrete / continuous location problem, location –allocation problem and covering problems.

Layout design, classification of layout, relationship chart, SLP structural design, Travel chart, layout design, including computerized layout planning (CORELAP, ALDEP & CRAFT) application of classical industrial engineering concepts to facilities planning, work systems design including method study and ergonomics and behavioral approach. Appreciation of issues related to facilities planner in conventional and new manufacturing systems and selected case studies.

Material handling: Importance of proper material handling equipment, factors that determine the nature of material handling equipments, Type of handling equipments, maintenance, Design, AGV's for FMS, Design of conveyer for internal and external transportation.

Text Books

1. Material Handling – Immer, J.R.
2. Plant layout & material handling –James Apple (John Wiley)
3. Material Handling System Design – James Apple (John Wiley)
4. Material Handling Principles & Practice – Theodore H. techonba, ogicus).

ME:		Semester -I	
Subject: Low Cost Automation			
Period / Week 1 period of 1 hours		Lecture	3
		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Automation: Basic concepts; Techniques adopted. Synthesis of low cost automation circuits. (Pneumatic & electro-pneumatic circuit) Appreciate technology for employing low cost automation equipment.

Fluid logic circuits: Fluid power controls. Low cost automation components used in field circuits for automation of processes. Pneumatics hydraulic drives for low cost automation. Moving part pneumatics logic devices. Principles and cases studies of techniques adopted in small units.

Automation of machine tools by low-level technology. Automation in machining using transfer machines.

Logic Gates & PLC—AND, OR NOT, NAND & NOR Application of basic control circuit based on these gate. Definition of PLC & application

Automation and mechanization of press working.

Aspects of automation in steel foundries.

Automation in inspection and quality control

Electrical control devices. Features and design principal & electrical circuit in drive, clutches & brakes, thermal relays time relays electrical circuit for machine tools.

TEXT BOOKS

1. Pneumatic Circuits and Low Cost Automation: Fawce, JR.
2. Fundamentals of Pneumatics: Festo series.
3. Industrial Hydraulics: Pippenger.
4. Automation, Production System and CIM: Mikell Groover, Prentice Hall.
5. Engineering Systems and Automatic Control: Peter Dransfield
6. Design of Machine Tools: S.K. Basu.
7. Automatic Control Systems, S.N. Verma.
8. Machine Tool Design, Volume IV: Acherkan.
9. Automated Assembly: Geoffery, Broothroyd, Corradopoli and Lawrence E. Murch; Marcel Decker Inc. 1982.

ME			Semester -I
Subject: ERP & Management information systems			
Period / Week 1 period of 1 hour		Lecture	3
		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction: Meaning and role of MIS, Management and organizational theory and systems approach, Characteristics, scope. Computer Integrated MIS.

DBMS: Data base management, objectives of DBMS, technical overview and management responsibilities. Elements of data base management system

Decision making: Information system for decision making– decision-making and MIS, MIS as a technique for making programmed decisions, decision support systems, implementation, evaluation and maintenance

ERP systems: Introduction to ERP, overview, evolution of MRP systems to ERP, Design of MRP-II, ERP data inputs and outputs, choosing an ERP system, design and implementation ERP system. ERP and Business Process Reengineering, salient features of popular packages such as SAP R/3, BAAN, PEOPLESOFT etc.

ERP and e-commerce –role ERP system for e- commerce, advantages, success and failure case studies.

TEXT BOOKS

1. ERP system, life cycle, electronic commerce and risk By Daniel E. O'leary, Cambridge university Trust
2. Information system for modern management R.Mordic ,J.E.Ross ,J.R.Claggett, PHI.

ME		Semester -II	
Subject: Advanced Operations research			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system:		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Advanced topics in linear programming: revised simplex, sensitivity analysis – changes in c,b,a. addition of new variable addition of new constraint.

Integer programming – cutting plane method, branch and bound method

Non- linear programming: constrained optimization, Lagrange multiplier for equity constant, Kuhn –Tucker Method for inequality constraints

Dynamic programming: Bellman's principle, forward & backward recursive procedure, cargo loading model, work force size model, equipment replacement model, inventory model with production smoothing

Markovian process: Scope, Gardener problem, Markov process, and Markov chains

Goal programming; introduction, simplex method for solving goal programming

TEXT BOOKS

1. Operations research by an introduction; Hamdy A. Taha Macmillan
2. Principal of operations Research by Harvery M.Wagner, Prentice Hall
3. Optimization by S.S.Rao; New age international (P) Ltd.
4. Operations research by Rvindran, Philips, Solberg. John Wiely & Sons
5. Introduction to operations research by Billy E. Gillett ;Tata McGraw Hill edition
6. introduction to theory and application of data envelopmer analysis, E.Thanssonlis, Kliver Academic Publisher 2001

ME:		Semester -II	
Subject: Purchasing & supply chain management			
Period / Week 1 period of 1 hours		Lecture	3
		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction: Role of purchasing and supply management in business, purchasing system, purchasing cycle, make or buy decision, outsourcing, vendor development and evaluation, reciprocity and ethics legal aspects. Purchasing as a strategic activity, purchasing performance measurement, source of supply, global sourcing, supply base optimization, early supplier involvement, BPO, vendor managed inventory.

Understanding the Supply chain, competitive strategy, supply chain strategy, strategic analysis tools: Porter's generic strategies, growth strategies, SWOT analysis, PLC Application, Achieving strategic fit, efficient and market responsive supply chains, supply chain drivers and obstacles, planning demand and supply in supply chains, demand amplification (Bull whip) effect, managing uncertainties, Transportation and network design

Role of information technology, E- business and the supply chain, ERP systems and data warehousing

Supply chain benchmarking, benchmarking overview, bench marking processes, supply chain performance, and measurement, Mapping supply chain process. Financial evaluation of supply chain decisions

Case studies in the above areas.

Text books

1. Supply chain management, strategy, planning operation; Sunil chopra & Peter Meindl, Pearson Education Asia -2001
2. Logistics & supply chain management strategic for reducer & improving finance; Martin Christopher, Pitaman Publisher 2nd edition 2001
3. Logistics and supply chain management; Concepts and cases ;G.Raghuram,N.Ranagraj; MacMillen India
4. Purchasing & supply chain management, Trent, Hand field 2nd edition Thompson South western
5. Purchasing and supply management, Test and carry, Donald. w. Dobler, David N. Burt. 6th edition TATA McGraw Hill 1996

ME:		Semester -II	
Subject: Corporate Finance and costing			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Scope of financial management, evaluation of co-operate finance, Goal of financial management, Indian financial system, Finance managements, calamity market, commercial ropes, Governamnet security.

Capital budging – Appraisal criteria for projects- Concept of Time value of money –pay back period, Accounting rate of return, net present value, and Internal rate of return, Benefit-cost ratio. Disconnected pay back, Annual worth / cost methods.

Minimum cost – solution methods, replacement decisions- Intestinal replacement, different replacement.

Concepts and measurement of cost of capital –cost of debt, cost of perpetual debt, Dividend approach, capital asset pricing model approach, consumption of overall cost of capital.

Source of long-term finance: Equity capital preference capital, debenture capital term loans. Primary market and stock market.

Working capital management: characteristics of current asset, working capital policy, and operating cycle analysis.

Financial accounting: Concepts and conventions in accounting, type of accounts, Double entry book keeping, Trail balance, Profit and loss Account, Balance sheet

Analysis of financial statements: leverage liquidly, turn over, profitability and valuate

Mergers and acquisitions: Types of merger, economics of erger, scheme and legal procedure for merger .Tax aspect of merger, financial frame work

Lease financing: Nature and type of reasoning, financial evaluation, economics of reasoning.

Costing: elements of cost, cost center, Direct and indirect cost, fixed, variable and semi variable cost, overheads, primary and secondary distribution. Apparionment and absorption of overheads

Job costing – cost sheet –marginal costing- Break even chart –cost volume profit analysis, Application for managerial decision making, standard costing -Analysis of variances

Text Books

1. Financial Management Theory and practice : Maheswari and Prasanna Chandra; TMH, 1995.
2. Fundamentals of Financial management, Text and cases: Prasanna Chandra, TMH, 1995.
3. Cost accounting: Prasad N.K., Syndicate Book Pub. Co. 1989.
4. Cost accounting: Bhabatosh Bannerjees, World Trade pvt Ltd, Shripati Bhattacharyaji.
5. Cost accounting: C. S. Rayudu , TMH 1996
6. Engineering Economics; Thuesen
7. Financial Management –Text and problems M.K.Khan ,P.K.Jain TMH

ME:		Semester -II	
Subject: World class manufacturing systems			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction: components of manufacturing system, Internal and external costumers TQM concepts, stages of the industrial cycle.

TQM Gurus: contribution of Deming , Juran, Ishikawa, Philip erosbly , Shigeo Shingo,Yoshio Konde, Kano.

Benchmarking: Definition of benchmarking, reasons to benchmark, process benchmarking, best practices in benchmarking.

Strategic planning; corporate strategy, Business strategy, steps in strategic, planning, SWOT analysis.

Emerging trends in manufacturing: BPR, SMED, JIT, FMS RMS&CIM. Theory of constraints and synchronous manufacturing.

Product design: concurrent engineering, FMECA, QFD, Taguchi loss function, Robust design, signal to noise ratio.

Information system for WCM; MRP-II, ERP system, VMS,SCM and CRM
Case studies in above areas.

Text books

1. TQM –Intergrated approach by Samuel K Ho, Kogan Page India PVT.ltd.2002
2. Total quality management by D.H. Bester field Pearson education Asia
3. World-class manufacturing, the lessons of simplicity applied; R. Schonberger,Free Press
4. CRM Essentials; J.W.Gosney and T.P.Boehrn ;PHI
5. Japanese manufacturing Techniques by R.J. Schonberger Free press.
6. Production and operations managements, Chase, Aquilanao and Jacobs. McGraw Hill.

ME:			Semester -II
Subject: Inventory planning & management system			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction: Basic inventory systems, types of inventory, P system, Q system, Quantity discounts.

Inventory systems under risk: introduction, static and dynamic inventory system with depend following probabilities distribution, service level and safety stock, back-ordering, lead time variability, anticipated price increase, Inventory control systems in practice.

Material consumption control: disposal of wastes and surplus and obsolete materials, causes of wastes and scraps salvaging, reverse logistics

Maintenance of materials and spare parts management: general considerations, capital insurance spares, control of maintenance of materials and spare parts

Material Requirement Planning: Independent demand, mechanics of MRP, inputs, implementation, lot sizing techniques, system nervousness firm planned orders and time fences, MRP II.

Distribution inventory management: multi location systems, industrial dynamics centralization inventories, distribution requirement planning.

Text Books

1. Production Planning and inventory control; S.L.Narasimhan ,PHI
2. Materials management, inventory control and logistics; A.K.Datta ,JAICO 3
3. Introduction to material management; Arnold and Cahapman ,Pearson Education Asia
4. Inventory control; Starr and Miller; Prentice Hall

ME:		Semester -II	
Subject: Entrepreneurship development			
Period / Week		Lecture	3
1 period of 1 hour		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Definition and scope; relevant to Indian condition, signification of entrepreneurship, business opportunities, trading vendoring , manufacturing, risk and rewards.

Selection of product; basis for selection, sources of information, product identification, short listing for opening based on competition technology, innovation and price, institutions rendering help in selection of product such as SIST, MIDC and other state and central government institutions.

Resources to be mobilized for entrepreneurship; decisions making processes. Product and development; market survey, identifying market tastes and requirements of prospective buyers, coordination, concept of coordination entrepreneur as coordination under uncertainty, coordination involving public goods completion threat to entrepreneur.

Market making system, making market, internal and external markets, market information, speculative intermediation, organizing supply of market making services, delegation, incentives and control, growth and dynamics of firm, entrepreneur as a vendor.

Resources; materials, persons, machines and methods, selection of equipment and other infrastructure, plant location, vicinity of production and marketing, location and layout of plant to suit local requirements.

Financing; self-financing, loans financing institutions budgeting investment for capital equipment, working capital costing and other related economics aspects.

Preparation of project report, in a accordance with guidelines laid down by government and controlling institutions, feasibility reports, production feasibility, quality feasibility, market feasibility and economic feasibility, organizing and maintaining quality specification and standards

Text books

1. Developing New Entrepreneurs, Entrepreneurs development Institute of India, Ahmedabad.
2. Entrepreneurship; Playing to win, Gordon Baty; Tarpowala and sons

3. Motivating Economics Achievement; David C. McClelland David G. Winter
4. Industrial Maharashtra: Facts, figures and opportunities.; Maharashtra Industrial Development corporation.
5. Management of small scale industry; Vasant Desai; Himalaya Publication.
6. The Seven Business Crises; How to Beat These; V.G. Patel TMH.
7. Starting and Managing the small Business; Arthur M. Kuriloff , John M. Hemphill, Jr. and Douglas C

ME:		Semester -II	
Subject: Organizational behaviour and personnel management			
Period / Week 1 period of 1 hours		Lecture	3
		Tutorial	2
Evaluation system		Hours	Marks
	Theory	4	100
	Internal assessment	-	50

Introduction: Definition of personnel management, school of thoughts organization science, activities of personnel management.

Organization psychology; cognitive process, learning concepts, intelligence and mental abilities, cognitive style.

Attitudes commitment and values: work attitudes and job satisfaction nature of job satisfaction & its importance. Consequences of organizational commitment, union commitment, behavioral commitment. Values and ethics.

Motivational practice and their theories; goal setting concept, management by objectives, work redesign by various approaches. Organizational behaviors modification, Behavior modeling.

Leadership styles; definition, traits in leadership, participative leadership theories theory X and Theory Y. contingency theory of leadership, least preferred coworker measure, octant model. Blanchard's situational leadership theory

Safety psychology and industrial clinical psychology; safety training, publicity improved safety climate, clinical model and performance treatment and corrective action.

Training and development, interview

Text books

1. International organizational psychology by John B. Miner, McGraw Hill International editions.
2. Personnel Management and Human Resources; C. S. Venkataratnam, B. K. Srivastava; TMH 1995.
3. Principles of Management: P. C. Tripathi, P. N. Reddy; TMH 1991
Organizational Behavior. Industrial and Business Management: Martand T. Teslang.
4. Organisation Behaviour , Text and case : Uma Sekram, TMH, 1995
5. Organisational Behaviour : F. Luthans, McGraw Hill.
6. Personnel Management: C. B. Memoria.
7. Factory Administration and Management: A. S. Deshpande.

REFERENCE BOOK

1. The Change in world of the Executive : Peter Drucker.
2. In search of excellence : Tom Peter and R. H. Waterman, Harper, 1996.

SEMESTER – III

SEMINAR ON THRUST AREAS

A student has to present a seminar on thrust area that should contain-

- Choosing an appropriate thrust area.
- Literature survey report.
- Study of fundamentals and formulating the principals for solving of the problems s.
- Basic design.
- Working out details of control mechanism required if any.
- Development of soft ware if necessary
- Suggestion for improvements
- Cost analysis

The seminar should be submitted in book let that is bound

SEMESTER – IV

A project should be assigned to each student at the beginning of the third semester either through industry sponsorship or of academic but practical utility topic on any subject areas, which involves the principles being studies in the above, ten subjects. The project will be worked full time in the third and fourth semester for any one-year duration. the general scheme of working will be as follows;

- Literature survey
- Basic study of the project and formulating the principles for solving the problems.
- Preparation of workable scheme.
- Basic design preparation
- Working out details of control mechanism required if any.
- Development of software if necessary.
- Fabricating the prototype model
- Testing of the model
- Suggestion for improvement
- Cost analysis