M.TECH IN ME –(PRODUCTION TECHNOLOGY)
(Part Time)

I SEMESTER

Subject Code	Name of Subject	Teaching Period			Credit Points
		L	T	P	
01MPE101PT	Metal Casting	4	1	0	5
01MPE102PT	Metal Cutting	4	1	0	5
01MPE-103PT	Metal Forming	4	1	0	5
01MPE-201PT	Lab-I	0	0	3	2
01MPE301PT	Discipline & Co-Curricular activities	0	0	4	1
TOTAL		**12**	**3**	**7**	**18**

II SEMESTER

Subject Code	Name of Subject	Teaching Period			Credit Points
		L	T	P	
02MPE-101PT	Non Conventional Machining Processes	4	1	0	5
02MPE-102PT	Jig, Fixtures & Die Design	4	1	0	5
02MPE-103PT	Computer Aided Design & Manufacturing	4	1	0	5
Practical/Viva-voce					
02MPE-201PT	Lab – II	0	0	3	2
02MPE301PT	Discipline & Co-Curricular activities	0	0	4	1
TOTAL		**12**	**3**	**7**	**18**

III SEMESTER

Subject Code	Name of Subject	Teaching Period			Credit Points
		L	T	P	
01MPE104PT	Machine Tool Design	4	1	0	5
01MPE105PT	Cutting Tool Design	4	1	0	5
03MPE-101PT	Product Design & Development	4	1	0	5
03MPE 301PT	Discipline & Co-Curricular activities	0	0	4	1
TOTAL		12	3	4	16

IV SEMESTER

Subject Code	Name of Subject	Teaching Period			Credit Points
		L	T	P	
02MPE-104PT	Management of Production Systems	4	1	0	5
02MPE105PT	Mechnatronics	4	1	0	5
04MPE301PT	Discipline & Co-Curricular activities	0	0	4	1
TOTAL		8	2	4	11

V SEMESTER

Subject Code	Name of Subject	Teaching Period			Credit Points
		L	T	P	
(Anyone) 03MPE-102.1PT 03MPE-102.2PT 03MPE-102.3PT	Methods Engineering & Ergonomics Entrepreneurship Statistics & Reliability Engineering	4	1	0	5
03MPE-201PT	Project work	4	0	0	4
03MPE-202PT	Seminar	3	0	0	3
TOTAL		11	1	0	12

VISEMESTER

Subject code	Name of Subject	TEACHING PERIODS			Credit Points
		L	T	P	
04MIE 201PT	DISSERTATION a) Continuous Evaluation b) Project Report c) Viva Voice	5 6 6	0	0	5 6 6
	Total	17	0	0	17

Production Engineering

METAL CASTING

Course/Paper: 01MPE-101PT
MPE Semester-I

Structure of silica and different types of clays, bonding mechanism of silica water-clay systems. Swelling of clays, sintering adhesion and colloidal clay; silica grain shape and size Distribution standard permeability A.F.S. clay Characteristics, Ingredients and additives of moulding sand, core sands

Solidifications of Metals, nucleation, free energy concept, critical radius of nucleus. Nucleation and growth in metals and alloys. Constitutional super cooling. Columnar Equiacquiesced and dendritic structures. Freezing of alloys centerline feeding resistance. Rate Of solidification, time of solidification, mould constant. Fluidity of metals, volumes redistribution. Analysis of the process.

Riser design shape, size and placement. Effect of appendages on riser ring. Effective feeding distances for simple and complex shapes. Use of chills, gating design, filling time. Aspiration of gases. Top, bottom and inside gating. Directional solidifications stresses in castings. Metal mould reactions. Expansion scale and metal penetration. Analysis of the process

Various moulding and casting processes, hot box, cold box process, investment, shell moulding, full mould processdie-casting, ceramic shell mould, vacuum moulding etc. (6 Hours) Non-ferrous Die-casting of Aluminum and its alloys, brass and bronze.

References

Fundamentals of Metals Casting by Flimm; Addison Wesley.
1. Principles of Metal Casting by Heine Loper and Resenthal; McGraw Hill.
2. Product Design & Process Engineering by Hielel and Draper; Mcgraw Hill.
3. Foundry Practice by Salman & Simans; Issac Pitman.
4. Metals Handbook- Metal Casting;ASME.

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

METAL CUTTING

Course/Paper: 01MPE-102PT

MPE Semester-I

Introduction, system of Tool nomenclature, Tool Geometry, Mechanism of Chip, formation and Forces in orthogonal cutting, Merchant's force diagram.

Oblique Cutting: Normal chip reduction coefficient under oblique cutting, true shear angle, Effective rake, influx region consideration for deformation, direction of maximum elongation, effect of cutting variables on chip reduction coefficient, forces system in oblique cutting, effect of wear land on force system, force system in milling, effect of helix angle.

Fundamentals of Dynamometry, Theoretical determination of forces, angle relations, heat and temperature during metal cutting; distribution, measurement, analysis, theoretical estimation of work piece temperature, hot machining

Fundamental factors, which effect tool forces: Correlation of standard mechanized test. (Abuladze relation), nature of contact and stagnant phenomenon, rates of strains, shear strain and normal strain distributions, cutting variables on cutting forces.

Cutting Tools: Tools materials analysis of plastic failure (from stability criterion), Analysis failure by brittle fracture , wear of cutting tools , criterion, flank and crater wear analysis, optimum tool life, tool life equations, (Taylor's woxen etc) Tool life test, machining optimization, predominant types of wear; abrasive, adhesive, diffusion wear models, wear measurements and techniques, theory of tool wear oxidative mathematical modeling for wear,

test of mach inability and influence of metallurgy on mach inability. Economics of metal machining Abrasive Machining: Mechanics of grinding, cutting action of grit, maximum grit chip thickness, Energy and grit force temperature during
grinding,wheelwear,grinding,processsimulation,testingOfgrindingwheels,mechanicsoflappingandhoning,freebodyabrasion.

References
- Principles of Machine tools by Sen & Bhattacharya by New Central BookAgency.
- Machining of Metals, by Brown; Prentice hall.
- Principles of Metal cutting by Shaw; Oxford I.B.H.
- Metal cutting theory & Cutting tool design by Arshimov & Alekree, MIR Publications.
- Machining Science & Application by Knowenberg Longman Press.

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

METAL FORMING

Course/Paper: 01MPE103PT

MPE Semester-I

Plasticity True stress and true strain, true stress-strain curves, selection of stress-strain curves for Cold and hot working, yield of isotropic plastic material, yield criteria. Tresca maximum sheer-strain energy criterion, plastic incompressibility, Poisson's ratio for plastic deformation flow rule, strain hardening function, heat generation and heat transfer in metal forming processes, temperatures in Quasi-continuous forming operations. Examination of Metal forming processes.

Prediction of working loads and maximum deformation analysis of the processes of wire Drawing /tube drawing, strip drawing and extrusion. Various parameters/variables affecting the Processes of wire drawing, tube drawing, strip drawing and extrusion; various methods of tube drawing and their comparison. Working loads for plain strain forging of strip and disc under conditions of well lubrications and sticking of material with die and under mixed conditions, Prediction of working loads under above approach (simple plain strain and axis symmetric problems)

Lubrication in metal forming processes, principles and mechanism of lubrications, hydrodynamic and their film lubrication, boundary and extreme pressure lubricants, solid lubricants, lubricants used for rolling and cold drawing, forging, extrusion and deep drawing processes; defects in various metal forming processes like rolling, forging, extrusion, wire drawing and deep drawing and their causes and remedial measures.

Theory and deep drawing of circular blanks, analysis of the process, prediction of radial stress and punch load, ironing, wrinkling, blank holding and various parameters/variables affecting the deep drawing process.

Rolling: Classification of rolling mills, analysis of the process. Prediction of roll pressure for flat strip rolling in the leading and lagging zones, roll separating forces, torque on the roll, affect of front and back tensions, affect of support rolls, various factors which affect rolling force

References
- An Introduction to the Principles of Metal working by Rowe, Arnold.
- Metal forming analysis by Avitzer, Mcgrawhill.
- Plasticity for mechanical Engineering by Johnson & Merlore; Van Northand.
- High Velocity working Metals by ASME; EEE

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

LAB-I

Course/Paper: 01MPE-201 PT

MPE Semester-I

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.

NON CONVENTIONAL MACHINING PROCESSES

Course/Paper: 02MPE-101PT

MPE SemesterII

New Technology, Introduction, Mechanical Processes, Abrasive jet Technology, Ultrasonic machining, whirling jet machining. Fundamental principles, process parameters, characteristics,

Tool design, Metal removal rate-analysis, important part design ,Analysis of the Process .Chemical and Electro-chemical machining Introduction. Principles & scheme, Process parameters, metal removal rate, dynamic and hydro-dynamic & hydro optimization, electrolytes. EDM: Introduction-basic principles & scheme, circuitry controls, metal removal rate, machining accuracy, optimization, selection of tool material and tool design, Di-electric, Analysis. Laser Beam Machining & Electron beam machining background, production of Laser, machining by Laser and other applications, Electron beam action, Dimensionless analysis to establish correlation, behavior EBM parameters. High Velocity forming of metals, explosive forming principles and applications, Electro-hydraulic and other applications, Analysis of the process.

References

- Non-traditional machining methods; ASME.
- New Technology by Bhattayacharya; I.E. (India)
- Ultrasonic cutting by Rozenberg; Consultants Bureau; N.Y.
- Electro - spark machining of metals; Vol. 2 by Lazarenko; consultant Bureau; N.Y.
- Electro chemical machining by DE Baar; McDonald.

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions

JIG,FIXTURE & DIE DESIGN

Course/Paper: 02MPE-102 PT

MPE SemesterII

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Jigs and Fixtures: Elements of jigs and fixtures, costs calculations. Locating element, clamping elements, procedure in designing. Jig and fixtures: Fits and tolerances analysis.
Non-Standard clamping devices, centralizers, equalizers, actuators (Pneumatic, hydraulic electric and electronic.)
Automatic loading and unloading devices.
Types of Frunions : Single, double and multi-axis and indexers.
Transfer line jigs & fixtures for the operation of Multi-drilling, boring, milling and grinding.
Assembly line fixtures.
Universal Jigs and Fixtures.
Transfer-devices, transfer machine, modulation-design concept, in process gauging.
Design of Dies: Elements of Dies and Punch. Types and design procedure, progressive dies, drawing die, bending die etc. Analysis

References

Jigs and Fixtures Design by Franklin-D-Jones.
Jigs and Fixtures by Colovin; F.H. and Massachusettes Institute of Technology.
Jigs and Fixtures Design by Hardy; H.W.
Jigs and Fixtures Design by Haughton; P.S.
Jigs and Fixtures by Parson.

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

COMPUTER AIDED DESIGN & MANUFACTURING

Course/Paper: 02MPE-103PT
MPE Semester-II

Introduction: CAD/CAM contents and tools; history of CAD/CAM development; CAD/CAM Market trends; Definition of CAD/CAM tools,
Industrial look at CAD/CAM.

CAD/CAM Hardware: Introduction; types of systems; CAD/Cam systems evaluation criteria; Input devices; output devices, hardware integration and networking; hardware trends.

CAD/CAM Software: Introduction; graphics standards; basic definition and modes of graphic operations; user interface; software modules, modeling and viewing; software documentation; Software development; efficient use of CAD/CAM Software; Software trends.

Microprocessor based CAD/CAM: Introduction; several features, system implementation; Hardware components and configuration; micro-based CAD software; file translation; operating systems, mechanical applications; micro-CAD trends; product distribution trends

Mathematical Representation of Curves: Introduction; wire frame models; wire frame, Entities, curves representation, parametric representation of analytical and synthetic curves, curve manipulation; design and Engineering applications.

Mathematical Representation of Surfaces: Introduction, surface models, surface entities, surface representation, parametric representation of analytic and synthetic surfaces, surface manipulation.

Mathematical Representation of Solids: Introduction, solid models, solid entities, solid representation, fundamentals of solid modeling, half spaces; boundary representation; constructive solid geometry sweep representation, solid modeling based applications; design and engineering applications.

Geometric Transformations: Introduction; transformation of geometric models, mappings of geometric models; inverse transmission and mappings; projections of geometric models; design and Engineering applications.

Mechanical Assembly and Tolerancing: Introduction; assembly modeling, representative schemes, generation of assembling sequences; tolerance concepts.

Part Programming and Manufacturing: NC, CNC and DMC machines, part programming, manufacturing processes, process planning, tool path generation; design and engineering applications

References

- CAD/Cam by Mikell P. Groover Mecry Wo Elimmers, Jr. 1991.
- The CAD/Cam Hand Book by Bed ford Masa Chusetles.
- Automation, Production Systems, and Computer Aided Manufacturing, Prentice Hall by Groover M.P.
- Numerical Control and Computer Aided Manufacturing by Pressman, R.N. and William, J.E. John Wiley & Sons NewYork.
- CAD/CAM Theory and practice by Ibrahim Zeid; Tata McGraw Hill, New Delhi (1998)

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

LAB-II

Course/Paper: 02MPE-201 PT

MPE Semester-II

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.

Importance of product design in industry. Principal requirements of good product design. Factors and considerations affecting product design. Ergonomic factor in product design. Product design methodology and techniques. Basic elements and concepts of visual design.

Materials, forms, function and color relationships. Product graphics, product development and testing. Packaging materials their characteristics and applications. Packaging design considerations

Value engineering, concept, advantage and applications. Value, types of values. Analysis of function, using and evaluating functions. Value engineering techniques. Value control.

References

- Industrial Design Mayall Mc Gruw Hill
- Product Design &Niebel& McGraw Hill
- Process Engineering Draper
- Introduction to Design Asimov Prentice Hall
- Value Engineering Mudge Mc GrawHill

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions

MACHINE TOOL DESIGN

Course/Paper: 01MPE-104PT

MPE Semester-III

Introduction, Classification of machine tools , elements of machine tools, selectionofspeedandfeed,Gearboxdesignvarioustypesofclutchsystems, Sohopke and Report drives, double bond gears analysis, Lohr criterion for optimizing double bond gear.

Step less drives, mechanical step less drive analysis, hydraulic step less drive & circuit analysis, design features, throttle valves, tracer controlled hydraulic circuit, hydraulic servo controls, electrical step less drive circuits and charterstics Strength and rigidity consideration, process capability and compliance,

Design of lathe bed, use of stiffness in bed, design of radial drill column and milling machine column. Analysis of spindle bearings, slides and guides, design of spindle/arbor, antifriction and journal bearings, hydrodynamic action in slides, analysis of hydrostatic bearings, roller guides, re circulating ball analysis, stick slip motion in guides-models, force analysis of lathe guide ways.

Vibrations of machine tools and dynamic rigidity: Effects of vibrations, source of vibrations, self excited vibration, single degree of freedom chatter, velocity principle and related models, regenerative principles, chatter in lathe, drilling milling and grinding. Tlusty and palace model, Peters model, elimination of machine tool structures matrix, finite elements and lumped constant models.

Automation: Automation drives for machine tools, degree of automation, semi-automatics, analysis of collect action, design, of collet, bar feeding mechanism, tooling layout, single spindle, multi spindle automatic, transfer machine, indexing Geneva mechanism, analysis, Swiss type automatic machine loading and unloading. Transfer-devices, modular design concept in process gauging.

Control system of machine tools: Control: Mechanical, electrical, hydraulic, numerical, fluidic, basic principle of cam control, hydraulic controls, fluid controls, numerical controls, feed back systems, primary systems programming. Basic devices, adaptive control. (6 Hours)

References

- Machine tool design by Mehta; Tata Mc Graw Hill.
- Principles of machine Tools by Sen & Bhattacharya; New Central Book Agency.
- Machine Tool design by Basu & Pal; Oxford & IBH
- Machine tool Design Vol. I to IV by Acherkan; Mir Publishers.
- Design principles of Metal cutting machine tools: Koerigsberger; Pergaman Press.

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

CUTTING TOOL DESIGN

Course/Paper: 01MPE-105
MPE Semester-III

Fundamentals of Cutting tools design, cutting tools and their principal elements, Tool geometry, system of nomenclatures and their interrelations, setting for the grinding of various basic cutting tool (turning, drilling, milling)

Tool materials, developments of various tool materials, their relative characteristics, modern trend in tool development, concept of tool life. Single point tools; purpose and principle types and their characteristics, design procedure of single point tools, design of various high production tools,

design of carbide tools. Form tools; purpose and types, design procedure and sharpening. Drills; purpose and principal types and their construction and geometry, development in the shape of twist drills analysis.

Milling Cutters; Purpose and types and their construction procedure of profile sharpened and form relieved cutters,

Design of hobs, analysis. Broaches: Purpose and types, design features of various broaches. Introduction of numerically controlled tools and their applications

References

- Principles of machine tools By Sen & Bhattacharya; New Central book Agency.
- Metal cutting theory and cutting tool design by Arshinov &Alekreev; Mir Publishers.
- Principles of Metal cutting By Shah; Oxford. IBH

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

PRODUCT DESIGN & DEVELOPMENT

Course/Paper: 03MPE-101PT

MPE Semester-III

Importance of product design in industry. Principal requirements of good product design. Factors and considerations affecting product design. Ergonomic factor in product design. Product design methodology and techniques. Basic elements and concepts of visual design.
Materials, forms, function and color relationships. Product graphics, product development and testing. Packaging materials their characteristics and applications. Packaging design considerations Value engineering, concept, advantage and applications. Value, types of values. Analysis of function, using and evaluating functions. Value engineering techniques. Value control.
REFERENCES
Industrial Design Mayall Mc Gruw Hill
Product Design & Niebel & Mc Graw Hill
Process Engineering Draper
Introduction to Design Asimov Prentice Hall
Value Engineering Mudge Mc Graw Hill
Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

MANAGEEMENT OF PRODUCTION SYSTEM

Course/Paper: 02MPE-104PT
MPE Semester-IV

Systems Theory and concepts: Systems defined, function and elements of a system, general system theory, systems theory and organization, systems concept and management. The systems approach, planning and systems concepts. Control and systems concepts, Information and systems concepts

Quantative techniques of system analysis: Systems analysis, problem solving, scientific method, mathematical analysis, models, computer techniques of analysis. Linear programming input output analysis, queuing Monte-Carlo techniques, Simulation, Industrial dynamics **Behavioral Aspects of System Design:** The motivation factors in System design, leadership factors in system design. The need for systematic human relationships, the need for systems change, resistance to change, behavioral consequences of system changes, Microanalysis of complex, man machine open systems, concept as a basis of human integration, meeting the human and social problems.

Flow system: Increasing complexity in distribution and production, increasing cost of a distribution, the total flow system, planning the transformation, service system, integrating systems. Program Management: Impact of advancing Technology, large scale integrating system. Program Management, concept functional stages of program-management, organizational modifications, matrix organization, applications of program Management.

Management Cybernetics: Management cybernetics in controlling a manufacturing firm, production and inventory control systems, production,

inventory, and employment control systems, the enterprise control systems.

References

- Elements of production planning and control by Eilon; Macmillan.
- Automatic Production system and computer integrated manufacturing by Groover; Prentice Hall.
- Manufacturing systems Engineering by Hitachi; Taylor & Francis. Hitogni.
- Manufacturing systems and Analysis by Baudin; Yourdon.
- Management of systems by Nauhria, R.N. & Parkash, Rajnish.
- Modern Production Management by Elwood, S. Buffa Wiley, Eastern(1984)
- Production/ Operations Management by Rishards I. Koin TMH (1979)

Note: Eight questions out of entire syllabus and well distribution are to be set; students are required to attempt 5 questions.

MECHNATRONICS

Course/Paper: 02MPE-105 PT

MPE Semester-IV

Control Engineering: Open loop and closed loop control system, system components, hydraulic, thermal, pneumatic processes and their electrical analogies.

Process Control: Concept of measurement of electrical and non-electrical parameters, displacement, force, temperature, pressure etc. and related signal conditioning techniques. Valves, drives and actuators, PID controllers, multivariable and multi-loop processes, basic circuits using pneumatic and PLC's. Sensors and Signal Conditioners: Transducers for Industrial processes, signal conditioning, output devices and displays.

Microprocessors and Interfacing: Microprocessors/ Microcontroller architecture and programming memory, Input/output operations and interfacing, peripherals, typical applications of Microprocessors, system design concept through case studies.

References

- Computer Control of manufacturing system by, Koren, McGraw Hill.
- Production Systems and CIM, Groover, PHI.
- Flexible manufacturing systems, by Maleki, Prentice Hall.
- Feedback Control Systems, BC. Kuo, PHI.
- Measurement Systems, by EO. Doeblin, McGraw Hill.

Note: Eight questions out of entire syllabus and well distribution are to be set; students are required to attempt 5 questions.

METHODS ENGINEERING & ERGONOMICS

Course/Paper: 03MPE-102.1PT
MPE Semester-IV

Introduction to Industrial Engineering and productivity measurement of productivity, Introduction to Work study, methods-study principles and motion economy, filming techniques and micro-motion analysis, Introduction to work measurement. Time study, performance allowances, work sampling, predetermined motion system, standard data system, job evaluation of merit rating. Wage incentive plans, MTM (Methods Time Measurement)

Introduction of Ergonomics, man/ machine/environment systems concept. Development of ergonomics

Design Approach: Anew design, modification, of existing design, assessment of design. Limitation of man and 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, Analysis.

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, crank levers etc. Instruments and displays.

Work Load: Static and dynamic muscular work. Human motor activity, metabolism, physical work load, measurement of physical work load, mental work load, measurement of mental work load, repetitive and inspection work, work duration and rest pauses, principles of motion economy, Analysis.

Climates:

a.) Heat Humidity: Body heat balance, effective temperature scales, zones of discomfort, effect of heat on body and work performance.

b.) Vibration: Terminology, Response of body to low frequency (LF) vibration, vibrations and discomfort, effect on health of worker, high frequency vibration, effect of H.F. vibrations, methods of reducing vibrations, analysis.

c.) Noise: Terminology, physiological effects of noise, annoyance of noise, speed interference, hearing loss, temporary and permanent thresh hold shift, effect of noise on performance, reduction of noise, personal noise protection. Analysis.

References

- Methods Engineering Study Krick, EV.
- Work study and Ergonomics Shah,H.S.DhanpatRai&Sons-1992.
- Introduction of Ergonomics Bridger-TataMcGrawHill-1995.
- Work Study Khanna, OP- Dhanpat Rai & Sons-1995.
- Sound, Noise and Vibration Control-Lyle, F.Yerges-VanNostrand-1978.

Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

ENTERPRENEURSHIP

Course/Paper: 03MPE-102.2PT
MPE Semester-IV

Introduction: Factors leading to Industrial development Entrepreneur definition and various concepts, self awareness. Motivational aspects, attitude development, creativity, copying with un certainties, resilience.

Information: Industrial potential, environmental scanning, Identification of opportunities, dynamics of an opportunity, business opportunities recognition. Government policy for Industrial development. Choice of Technology Research for patents, product development.

Planning: Planning of an Industrial unit, project planning, identification of market and demand for product, role of significant variables, execution of projects legal aspects, financial aspects and labour laws, feasibility studies, sectoral, Industrial and unit level feasibility, exposure to past, present and future. Entrepreneurial Management: Business finance Management through elementary concept break even, working capital knowledge of various institutions and their mode of assistance. Elements of Production processes, quality control, Inspection methods. Production planning group dynamics.

References

- Entrepreneurship development programme in India and its relevance to developing countries by VG Patel; EDI-India; Ahmedabad (1987)
- Developing of New Entrepreneurship by EDI India; Ahmedabad (1987)
- Self made Impact making Entrepreneurship by G.R. Jain and M.A.Ansari; by EDI India; Ahmedabad (1988) Note: Eight questions out of entire syllabus and well-distributed are to be set; students are required to attempt 5 questions.

STATISTICS AND RELIABILITY ENGINEERING

Course/Paper: 03MPE-102.3PT
MPE Semester-IV

Statistics: Introduction; Principal uses of Statistics, Sampling, Frequency Distributions; Normal Distribution; Logarithmic normal distribution; Poisson distribution; correlations; Probability, Tests of significance; the Chi-Square tests; Differences in means of large samples; Differences in means of small samples; the t-test; Confidence limits; Analysis of Variances; Time Series, Monte-Carlo Method.

Reliability: Introduction, Reliability concepts and patterns of failure; Reliability Management; Reliability for system effectiveness.)

Reliability and Hazard Rates: Failure data; Reliability function; Failure rate and hazard rate; Common distributions in failure mechanisms-Exponential, Weibull, Gamma, Lognormal Extreme Value; Model selection for component failures; Failure analysis

Reliability Prediction and Analysis: Reliability prediction based on Exponential Distribution; System Reliability analysis- Block diagram method, fault tree and sconces tree methods, event tree method, failure mode, failure mechanisms.

Reliability Design: Design for Reliability, Design process, assessment methodology, Reliability allocation, Reliability improvements, Selection of

Components to improve system Reliability

References

1. Reliability Engg. & Terotechnology, by A. K.Gupta, Machmillan India Ltd. Delhi (1996)
2. Introduction to Reliability Engg. By E.E, Levis,Wiley& Sons NewYork
3. Reliability Engg. by L.S. ShriNath Affiliated East West Press
4. Probability and Statistics for Engineers by R.A. Johnson, Prentice Hall of India Pvt. Ltd, New Delhi (1995)

Note: Eight questions out of entire syllabus and well-distributed are to be set. Students are required to attempt five question

PROJECT WORK

Course/Paper: 03MPE-201PT
MPE Semester-V

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: 03MPE-202PT
MPE Semester-V

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 VI

DISSERTATION

Course/Paper: 4MPE-101PT
MDC Semester-VI

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.