

**SCHEME OF INSTRUCTION & EXAMINATION
B.E IV YEAR (REGULAR)**

(MECHANICAL ENGINEERING)

SEMESTER - I

Sl. No.	Syllabus Ref.No	SUBJECT	Scheme of Instructions		Duration in Hrs	Scheme of Examination		
			Periods per Week	L/T D/P		Maximum Marks	Univ. Exam Sessions	
THEORY								
1.	ME 401	Production and Operations Management	4	-	3	75	25	
2.	ME 402	Thermal Turbo Machines	4	-	3	75	25	
3.	ME 403	Metrology and Instrumentation	4	-	3	75	25	
4.	ME 404	Finite Element Analysis	4	-	3	75	25	
5.	ME 405	Operations Research	4	-	3	75	25	
6.		ELECTIVE – I	4	-	3	75	25	
PRACTICALS								
1.	ME 431	Thermal Engineering Lab	-	3	3	50	25	
2.	ME 432	Metrology & Instrumentation Lab	-	3	3	50	25	
3.	ME 433	Project Seminar	-	3	-	-	25	
TOTAL			20	9	-	475	220	

Elective –I

ME 406 Fuzzy logic and Neural Networks
ME 407 Automobile Engineering Mgmt.
ME 408 Non-Conventional Energy Sources
ME 409 Tool Design
ME 410 Microprocessor Applications
ME 411 Entrepreneurship

Service Course

ME 421: Industrial Admn., and Financial

ME 401

PRODUCTION AND OPERATIONS MANAGEMENT

Instruction:	4 Periods per week
Duration of University Examination	3 Hours
University Examination:	75 Marks
Sessionals:	35 Marks

Unit-I

Scientific Management by Taylor and Fayol. Functions of Management Types of Business firms and organizations structures.

Manufacturing Process Technology: Project, job shop, batch, assembly line and continuous process technology; flexible manufacturing systems.

Unit-II

Locating production and service facilities, effects of location and costs and revenues, factor rating, simple median model.

Layout planning: process layout: product layout-Assembly lines; manufacturing cellular layout.

Scheduling systems and aggregate planning for production and services; operations planning and scheduling systems; loading assignment algorithm; priority sequencing and other circuits.

Unit-III

Work methods analysis, work measurement techniques; predetermined time study; work sampling managing for quality; process variation; statistical process control charts for variables and attributes.

Unit-IV

Material Handling:

Earthmoving Machinery: Types, working and applications of excavators, tractors and scrapers. Operation and selection of (a) Hoisting equipment: cranes, trucks and wagons; (b) conveying equipment: Belt, Screw and bucket conveyor systems aerial ropeway. Principles of pneumatic and hydraulic conveying systems: automatic handling, AGV, RGV.

Unit-V

Japanese management overview, value added manufacturing, Japanese manufacturing techniques; total quality emphasis-Deming contribution to TQM, quality circles; fishbone diagram, Taguchi method of quality control, push or pull system kanban system.

Suggested Reading:

1. Everett, E. Adam. Jr and Ronald. J.Ebert- "Production and operations management-concepts, models and behaviour"-Prentice Hall (India) Pvt Ltd. New Delhi, 5th ed . 1998.
2. Lee J.Krajewski, Larry.P.Ritzman, "operations Management: Strategy and Analysis"-Addison Wesley Longman(Singapore) Pvt Ltd., India Branch, 5th ed. 2000 year.
3. Richard B.Chase, Nicholas, J.Aquilano and F.Robert Jacobs. "Production and operations management-manufacturing and services"-Irvin McGraw-Hill, New Delhi, 5th ed. 1998.
4. Maheeshverma, "Conservation equipment and its planning and application"-Metropolitan book Co.Pvt.Ltd, New Delhi, 3rd ed 1997.

ME 402

THERMAL TURBO MACHINES

Instruction:	4 Periods per week
Duration of University Examination:	3 hours
University Examination:	75 Marks
Sessionals	25 Marks

Unit-I

Introduction to compressible flows: Speed of propagation of pressure waves, Mach number, Acoustic velocity and Mach cone, limits of compressibility pressure field due to a moving source of disturbance One dimensional compressible flow.

Isentropic flow with variable area – Mach number variations, Area ratio as function of Mach number, flow through nozzles and diffusers.

Flow in Constant area ducts with friction – Fanno flow, variations of flow properties, variations of mach number with duct length, Isothermal flow with friction.

Unit-II

Flow in constant area ducts with Heat Transfer- The Rayleigh line, Rayleigh flow relations variation of flow properties, Maximum heat transfer.

Flow with Shock Waves – Development of Normal shock waves, governing equations, Prandtl-Meyer relation, Rantine-Hugonit equations, Stagnation pressure ratio across the shock, Introduction to oblique Shock Waves.

Unit-III

Roto dynamic compressors: Introduction and general classification. Comparison of Reciprocating and Rotary compressors. Positive displacement Rotary compressors. Flow through Rotary compressors. Static and total head quantities. Thermodynamic cycles and work done. Calculation of various efficiencies. Velocity diagrams and prewhirl. Energy transfer between fluid and Rotor (Euler's equation). Analysis of Centrifugal compressors and analysis of axial flow compressors. Surging and stalling.

Unit-IV

Stream Turbines: Flow over blades, Types of turbines, Methods of reducing rotor speed, Velocity diagrams for moving blade, Work done on blades, Effect of blade friction on velocity diagrams, the simple De Laval turbine, Impulse turbine with several blade rings, Construction of velocity diagrams for axial discharge, Velocity diagrams for Parsons Reaction Turbine, Height of blades for Reaction turbine, Application of energy equation to turbine blade, the effect of blade friction, Reheating of steam bleeding, the regenerative cycle, Balancing of end thrust.

Unit-V

Gas Turbines: The gas turbine and the classification, constant pressure and explosion type gas turbine, Development and improvements, Calculation of various efficiencies and parameters, Application of Gas Turbines, Air Craft Propulsion: Air craft engine types, aircraft propulsion theory, Ramjet engine, Pulsejet engines, Rocket Propulsion: Types of Rocket engines, Rocket propulsion theory-Rocket application.

Suggested Reading:

1. Yahya S.D.M., "Fundamental of compressible flow", Wiley Eastern Ltd., 2003.
2. Mathur M.L. & Mehta F.S., "Thermal Engineering", Jain Brothers (New Delhi), 1996.
3. Dannis G. Shepherd "Aerospace propulsion", Elsevier publishing company, 1972.
4. H. Cohen, G.F.C. Rogers and H.I.H. Saravana muttoo., "Gas Turbine Theory", Longman, 5th ed 2004.

ME 403

METROLOGY AND INSTRUMENTATION

Instruction:	4 Period per week
Duration of University Examination:	3 Hours
University Examination:	75 Marks
Sessionals	25 Marks

Unit-I

Introduction-Linear and Angular measurements-Slip gauges and End bars- Gauge material and manufacturing methods, Different types of Micrometers, Height gauges, Tomlinson gauges. Precision polygon, Sine Bar, Auto collimator, Dial indicator, Sigma and Mechanical comparator, Free flow and Back pressure type Pneumatic comparator. Application of jet gauge heads.

Unit-II

Optical projector, Chart gauges, Micro gauge bridge lines. Tool maker's Microscope, Coordinate Measuring Machine. Measurement of Straightness and Flatness. Roundness Measurements with bench centers and talyronid Surface Roughness Measurement Profilometer, Taylor Hobson Talysurf.

Unit-III

Limits and Fits, ISO systems: Types of interchangeability. Taylor's Principle for plain limit gauges. Use of Plug, Ring and Snap gauges. Indicating type limit gauges. thread metrology- 2-wire and 3-wire methods, Gear measurement –Gear tooth thickness. Parkinson gear tester Gear measurement by gratings, General geometric tests for testing machine tools.

Unit-IV

Elements of instrumentation system. Static and Dynamic characteristics. Types of error Displacement transducers. LVDT. Strain measurement-Wire and foil type resistance strain gauges. Rosette Gauges .Bonding procedure. Lead resistance compensation. Adjacent arm and self compensating gauges. Proving ring. Strain gauge load cells. measurement of axial load and torsion by strain gauges. Piezo electric load cell.

Unit-V

Introduction to Seismic Transducers- displacement and acceleration measurement, Pressure measurement-Bourdon pressure gauge. bulk modulus guage, pirani guage, Temperature measurement by thermo couples. Laws of thermo electricity. Types of materials used in thermocouples. Protection tubes. Extension wire. Series and parallel circuits. Ambient temperature compensation.

Suggested Reading:

1. R.K. Jain, "Engineering Metrology", Khanna Publications, 1996.
2. P. Donald Echman, "Industrial Instrumentation", John Wiley and Sons. 1996.
3. Hume, "Engineering Metrology", Kalyani Publications. 1985.
4. Doebelin, "Measurement Systems Application and Design", Tata McGraw Hill 5th ed. 2004.

ME 404

FINITE ELEMENT ANSLYSIS

Instruction:	4 Period per Week
Duration of University Examination:	3 Hours
University Examination:	75 Marks
Sessionals	25 Marks

Unit-I

Introduction to Finite Element Method for solving field problems. Stress and Equilibrium, Boundary conditions, Strain, displacement, stress-strain relations.

One dimensional problems: Finite element modeling, coordinates and shape functions, Potential Energy approach: Assembly of Global stiffness matrix and load vector. Finite element equations, treatment of boundary conditions, quadratic shape functions.

Unit-II

Analysis of trusses and frames: Element stiffness matrix for a truss member. Analysis of plane truss with number of unknowns not exceeding two at each node. Analysis of frames with two translations and a rotational degree of freedom at each node. Analysis of Beams: Element stiffness matrix for two nodes, two degrees of freedom per node beam element.

Unit-III

Finite element modelling of two dimensional stress analysis with constant strain triangles and treatment of boundary conditions. Finite element modelling of axi-symmetric solids subjected to axi-symmetric loading with triangular elements.

Unit-IV

Two dimensional four noded iso-parametric elements and numerical integration. Steady state heat transfer analysis: One dimensional analysis of a fin and two dimensional analysis of thin plate. Analysis of a uniform shaft subjected to torsion.

Unit-V

Dynamic Analysis: Formulation of finite element model, element matrices, evaluation of Eigen values and Eigen vectors for a stepped bar and a beam. Time dependent field problems: Application to one dimensional heat flow in a rod. Introduction to Finite element formation for three dimensional problems in stress analysis. Convergence requirements. Introduction to Finite Element Analysis Software.

Suggested Reading:

1. Tirupathi. R Chandraputla and Ashok .D Belagundu, "Introduction to Finite Element in Engineering ", Practice Hall of India, 1997.
2. S.S. Rao, " The Finite Element Method in Engineering", Pergamon Press, 1989.
3. Segerlind .L.J., "Applied Finite Element Analysis", Wiley Eastern, 1984.
4. J.N.Reddy., "An Introduction to Finite Element Method", McGraw Hill, 1984.

ME-405

OPERATIONS RESEARCH

Instruction:	4 Periods per Week
Duration of University Examination	3 Hours
University Examination:	75 Marks
Sessional	25 Marks

Unit-I

Introduction to Operations Research, simulation and art of modeling. Construction of Linear Programming(LP) model. Standard LP form and determination of basic solutions. Unrestricted variables and solutions. Simplex method, Big-M method. Two phase method, Degeneracy, Unbounded solution, infeasible solution.

Unit-II

Duality: Definition, Relationship between optimal primal and dual solutions. Economic interpretation, Dual simplex method, Post optimal or sensitivity analysis integer programming.

Unit-III

Transportation model, Transportation algorithm. Assignment model, Hungarian method Transshipment model. Traveling salesman problem, Dynamic Programming .Knapsack problem, Problem of dimensionality.

Unit-IV

Network model: Minimum spanning tree algorithm. Shortest route problem, Maximal flow model. Minimum cost capacitated flow problem, Theory of games.

Unit-V

Probabilistic dynamic programming, Queuing models, Poisson queue, single server and multiple server models.

Decision Analysis: Decision criteria, Decision Trees, Sensitivity analysis with Decision trees, Using Utilities to Better reflect the value of payoffs. The practical application of decision analysis.

Suggested Reading:

1. Hamdy, A. Taha, "Operations Research-An Introduction", Sixth Edition, Prentice Hall of India Pvt Ltd., 1997.
2. Harvey M. Wagner, "Principles of Operations Research", Second Edition, Prentice Hall of India Ltd., 1980.
3. F.S. Hiller, M.S. Hiller "Introduction to Management Science" Second Edition Tata McGraw Hill, 2003.
4. S.D. Sharma, "Operations Research", Kedar Nath Ram Nath & Co., 2004

ME 431

THERMAL ENGINEERING LAB

Instruction:	3 Periods per Week
Duration of University Examination	3 Hours
University Examination:	50 Marks
Sessional	25 Marks

1. Determination of COP of the Air conditioning systems.
2. Determination of percentage relative humidity and study of humidification and dehumidification process in Air Conditioning systems.
3. Determination of COP of the Refrigeration systems using capillary tube and Thermo static expansion valve.
4. Determination of overall efficiency of centrifugal blower.
5. Experiments on an Axial flow fan test rig for the measurement of dynamic pressure, total pressure and efficiency of the fan.
6. Pressure distribution on symmetrical and non symmetrical specimen in wind tunnel.
7. Measurement of lift and drag of the models in the wind tunnel test section.
8. Measurement of thermal conductivity of metal bar.
9. Determination of the efficiency of pin-fin subjected to natural and forced convection.
10. Determination of effectiveness of heat exchanger.
11. Determination of emissivity of given test plate.
12. Determination of Stefan Boltzman constant.

ME 432

METROLOGY AND INSTRUMENTATION LAB

Instruction:	3 Periods per Week
Duration of University Examination	3 Hours
University Examination:	50 Marks
Sessional	25 Marks

1. Measurement with inside, outside and depth micrometers.
2. Measurement with height gauges, height master, etc.
3. Measurement of Linear and Angular dimensions with Tool Maker's Microscope- Flat specimen's plain, cylindrical specimens with centers and threaded components.
4. Measurement with Dial Indicator /Electrical Comparator/Mechanical Comparator/Dial Bore Gauges, etc.
5. Measurement of angles with Sinebars, Bevel protractor and Precision level, Block level, etc.
6. Measurement roundness error with bench centers.
7. Geometrical tests on Lathe machine.
8. Measurement of flatness error (surface plate) with precision level.
9. Measurement with optical projector.
10. Checking machined components with plug gauge, adjustable snap gauge, indicating gauge ,etc.
11. Force measurement with strain gauge type load cell / proving ring/piezoelectric load cell etc.
12. Temperature measurement with thermocouples.

ME 433

PROJECT SEMINAR

Instruction	3 Periods per week
Sessional	25 Marks

The Objective of the Project Seminar is to actively involve the student in the initial work required to undertake the final year project. It may comprise of:

- Problem definition and specifications
- A broad understanding of the available techniques to solve a problem of interest
- Presentation (Oral and Written) of the project.

The Department can initiate the work related to project allotment at the end of III year II semester and complete it in the first two weeks of the fourth year I semester.

First 4 weeks of IV year Ist semester will be spent on special lectures by faculty members, research scholar speakers from industries and R & D institutions. The objective of these talks is to expose students to real life/practical problems and methodologies to solve them.

A seminar schedule will be prepared by the coordinator for all the students. It should be from the 5th week to the last week of the semester and should be strictly adhered to.

Each student is required to:

1. Submit a one page synopsis before the seminar talk for display on the notice board
2. Give a 20 minutes presentation through OHP, PC, Slide projector followed by a 10 minute discussion.
3. Submit a report on the seminar topic with a list of reference and slides used.

Atleast two teachers will be associated with the evaluation of the project seminar for the award of the Sessional marks which should be on the basis of performance on all the three items stated above

Note: Three periods of contact load will be assigned to each project guide

ME 406

FUZZY LOGIC & NEURAL NETWORKS

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT -I

Introduction: Knowledge- based information processing. A general view of Knowledge based algorithm. Neural Information processing. Hybrid Intelligence. Artificial Neuron.

UNIT -II

Basic Neural Computation Models:

Basic concepts of Neural Networks -Network properties, Node properties. sigmoid functions. System dynamics, Inference and learning algorithm. Data representation. Functional classification models -single layer perceptions. Multi layer perceptions.

UNIT -III

Learning: Supervised and unsupervised statistical learning. AI learning.

Neural Network Learning -Back.Propagation algorithm and derivation. Stopping criteria. Complexity of Learning Generalization.

UNIT -IV

Self-organizing Networks:

Introduction, The Kohonen algorithm. Weight initialization, weight training, associative memories, bi-directional associative memories.

UNIT-V

Hopfield Networks:

Introduction. The Hopfield model, Hopfield network algorithm. Boltzman's machine algorithm. Neural Network applications.

Suggested Reading:

1. Limin Fu: Neural Networks in Computer intelligence. Tata McGraw Hill, 2003.
2. Bart Kosko: Neural Networks and Fuzzy systems, Prentice Hall of India, 1994.
3. James A. Freeman: Simulating Neural Networks, Addison Wesley Pub, 1995

ME 411

AUTOMOBILE ENGINEERING

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

Unit-I

Types of automobiles: Normal, Hybrid and Hydrogen Fuel vehicles. Engine location and its components, chasis layout, crank shaft proportion, firing order, piston and piston rings, cylinder liners, valves and operation mechanism, inlet and exhaust manifolds, carburetion and fuel injection system, Mechanical Fuel Injection system & Electronic Fuel Injection system.

Unit-II

Lubricating systems: Wet sump, dry sump and petrol systems.

Cooling systems: Water pumps, radiators, thermostat control anti freezing compounds.

Types of Ignition Systems, Modern Ignition systems, Types of batteries and charging systems, starting motors, lighting and electrical accessories, automobile air-conditioning.

Unit-III

.Steering systems: Linkage arrangements and its components modified Ackerman linkage-Wheel alignment, caster and camber. Rack and pinion assembly - Recent Trends.

Wheel and tyres: Tyre construction, specification. Tyre wear and causes, wheel balancing, Types of Suspension system, independent suspension, coil and leaf springs, torsion bar, shock absorbers.

Unit-IV

Power Train: Clutches, gear and gearbox manual, semi-automatic and automatic gearboxes. Torque converter, propeller shaft, universal coupling differential, Four-wheel drive system.

Brakes Systems: Description and operation of hydraulic brake, leading and trailing shoe layout, disc brakes, master cylinder, hand brake linkage - Recent Trends.

Unit-V

Maintenance: Pollution control, trouble shooting and servicing procedure overhauling, engine tune up, tools and equipment for repair and overhaul, testing equipment, pollution control technologies used for petrol and diesel engines, types and study of catalytic converters, Euro norms 2 & 3 and Bharat Norms - Recent Trends.

Suggested Reading:

1. CROUSE & Anglin, 'Automotive Mechanics', Tata McGraw Hill, Publishing Co. Ltd., New Delhi, Tenth Edition - 2004.
2. KirpalSingh., Automobile Engineering, Vol.I & II Standard Publishers, Delhi.
3. Joseph Heitner, Automotive Mechanics_Affiliated East West Pvt. Ltd.
4. C.P. Nakra, Basic Automobile Engineering, Dhanpat Rai Publishing Co.(P} Ltd., New Delhi, 2003.

ME 408

NON-CONVENTIONAL ENERGY SOURCES

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

Unit-I

Statistics on conventional energy sources and supply in developing countries. Definition - concepts of NCES. Limitations of RES. Criteria for assessing the potential of NCES. Classification of NCES - Solar, Wind, Geothermal, Bio-mass, Ocean Energy Sources. Comparison of these energy sources.

Unit-II

Solar Energy - Definition - Energy available from Sun, Solar radiation data, Solar energy conversion into heat - Flat plate and concentrating collectors. Mathematical analysis of flat plate collectors and collector efficiency. Principle of Natural and Forced convection. Solar engines - Stirling, Brayton engines, Photovoltaic – p-n junctions, solar cells, PV systems - Stand. alone, Grid connected solar power satellite, Mathematical analysis of flat plate collector and collector efficiency.

Unit-III

Wind energy Conversion, General formula - Lift and Drag - Basis of wind energy conversion - Effect of density, frequency variances, angle of attack, wind speed. Windmill rotors - Horizontal axis and Vertical axis rotors. Determination of torque coefficient. Induction type generators - working principle.

Unit-IV

Nature of Geothermal sources, Definition and classification of resources. Utilization for electricity generation and direct heating. Well Head power generating units. Basic features - Atmospheric exhaust and condensing, exhaust types of conventional steam turbines. Pyrolysis of Biomass to produce solid, liquid and gaseous fuels. Bio-mass gasification, Constructional details of gasifier, usage of bio-gas for chulhas. Various types of chulhas for rural energy needs.

Unit-V

Wave: Tidal and OTEC energy,- Difference between tidal and wave power generation. Principles of tidal and wave power generation. OTEC power plants. Operational of small-cycle experimental facility, Design of 5 Mw OTEC pro-commercial plant. Economics of OTEC. Environment Impacts of OTEC. Status of multiple product OTEC systems.

Suggested Reading:

1. Ashok V. Desai, "Non-Conventional Energy", Wiley Eastern Ltd., 1990.
2. K.M. Mittal, "Non-Conventional Energy Systems"; Wheeler Publishing Co. Ltd., 1997.
3. R. Ramesh, K.U. Kumar, "Renewable Energy Technologies", Narosa Publishing House, New Delhi, 1997.
4. M.M. Wakil, "Power Plant Technology", McGraw Hill Book Co., 1985.

ME 409

TOOL DESIGN

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

Unit-I

Cutting tool materials and processes: Desired properties, Types, major constituents, relative characteristics, latest developments, ISO: Classification and coding of carbide tools, Coated tools. Principles of working and applications of USM, EDM, ECJv1, AJM, LBM, and EBM. Super finishing processes: Honing, Lapping Burnishing, Ballizing, Polishing.

Unit-II

Design of single point cutting tools, Form Tools: Design of flat and circular Form Tool correction and tool holding methods.
Design of Multi Point Cutting tools: Milling Cutters: Major types, design and manufacturing of peripheral, end and -face milling cutters_ forces and power estimation. Grinding of milling cutters.
Broaches: Pull and Push types. Internal and External broaches, geometry and design and manufacturing of Pull type and push type broaches.

Unit-III

Multi point cutting tools:

Twist Drill geometry, Design and manufacturing of twist drill. Effect of variation of different angles on torque and thrust forces. Types and design of shanks. Sharpening of twist drill. .

Reamers: Reamers: Types. geometry, Reaming allowance tolerance disposition, Design and manufacture of twist-drills.

Taps and Dies: Types:: Geometry, Design and manufacturing of Taps and Dies. .

Unit-IV

Design of Press tools: Die set elements. Design of Die set for simple components by Blanking, Piercing, bending, Drawing, Forging and Spinning.

Plastic Tools: Plastic Dies for simple components.

Unit-V

Jigs & Fixtures: Design principles and construction features. Locating methods associated with flat, cylindrical internal and external surfaces. Type of locating pins. Requirements and choice of locating systems. Redundant location, fool proofing. Setting blocks, types of clamping devices and their basic elements. Quick action clamps and nuts. Equalizing and multiple clamping pneumatics. Hydraulic, magnetic, electrical and vacuum clamping.. Types of drill jigs and their classification. Types of jig bushes, jig feet, indexing jigs. Design of Fixtures for Turning, grinding, welding and Milling. Economic analysis of Jigs and Fixtures.

Suggested Reading:

1. Donaldson, Leain and Goold, "Tool Design", Tata McGraw Hill, NewDelhi, 1983.
2. "Rodin -Design of cutting tools", Mir Publications, Moscow.
3. Amitabha Battacharya and Inyong Ham, "Design Of Cutting Tools, Use Of Metal Cutting Theory",
ASTME publication Michigan USA., 1969. "
- 4.Surender Keshav & Umesh Chandra -"Production Engineering Design

ME 410

MICROPROCESSOR APPLICATIONS

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit-I

Basic Concepts: Wheel and the microprocessor - what is a microprocessor? – 4-8-16-32- Evolution of microprocessors - organization of microcomputers - microprocessor programming - digital logic - timing diagram conventions.

Data Representation: Introduction - positional number systems -the binary number system - representation of integers - representation of. real number - binary arithmetic - other number systems - character representation.

Unit-II

Programming a microprocessor: Introduction - organization of the 8085 instruction set of the 8085 - programming the 8085 – assembler programming -language for writing. Algorithms - programming examples - the Zilog80.

Unit-III

Semi conductor memories: Introduction -characteristics of memories static rams- dynamic RAMS.

Re-programmable ROMS - Memory system reliability.

Microprocessor Timings: Introduction - timing and control unit - timings of Intel 8085 - timing of zilog Z80 - register organization.

Unit-IV

Interfacing memory and I/O Devices: Introduction address space partitioning - memory interfacing -data transfer schemes - programmed data transfer direct memory access data transfer - serial data transfer.

Interfacing Devices: Introduction - types of interfacing devices - address decoding for I/O - INPUT/OUTPUT ports - programmable interrupt controller- programmable DMA controller - communication interface - analog input devices - analog output devices - analog input subsystems - analog output subsystems.

Unit-V

Application of micro processors: Introduction - a temperature monitoring system - automotive applications- closed loop process control.

Suggested Reading:

1. Aditya P. Mathur, " Introduction to Microprocessors", Tata McGraw Hill publishing company Ltd.,New Delhi.2002
2. "RAM B, "Fundamentals of microprocessors and micro-computers", Dhanpat Rai & Sons 2000.
3. M. Rafiq - uz - zaman., " Microprocessors theory and applications., PHI,2001.

ME 411

ENTREPRENEURSHIP

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

Unit –I

Indian Industrial Environment – Competence, Opportunities and challenges, Entrepreneurship and economic growth. Small Scale Industry in India Objectives, Linkage among small medium and heavy industries. Types and forms of enterprises.

Unit –II

Identification and characteristics of entrepreneurs. Emergence of First generation entrepreneurs, environmental influence and women entrepreneurs. Conception and evaluation of ideas and their sources. Choice of Technology – Collaborative interaction for Technology development.

Unit –III

Project formulation. Analysis of market demand. Financial and profitability analysis and technical analysis. Project financing in India.

Unit –IV

Project Management during construction phase, project organization, project planning and control using CPM, PERT Techniques. Human aspects of project management. Assessment of tax burden.

Unit – V

Behavioral aspects of entrepreneurs: Personality – determinants , attributes and models. Leadership concepts and models. Values and attitudes. Motivation aspects. Change behavior. Time Management: Various approaches of time management, their strengths and weaknesses. The urgency addiction and time management matrix.

Suggested Reading:

1. Vasant Desai, Dynamics of Entrepreneurial Development and Management, Himalya Publishing House, 1997.
2. Prasanna Chandra, Project – Planning. Analysis, Selection, Implementation and Review, Tata McGraw Hill publishing Company Ltd. 1995.
3. Stephen R. Covey and Roger Merrill A., First Things First, Simon and Schuster publication, 1994.
4. Sudha G.S., Organizational Behaviour, National Publishing house, 1996

ME 421

INDUSTRIAL ADMINISTRATION AND FINANCIAL MANAGEMENT

Instruction	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

Unit I

Industrial Organization_: Types of various business organizations. Organisation structures and their relative merits and demerits. Functions of management.
Plant location and layouts: Factors affecting the location of plant and layout. Types of layouts and their merits and demerits.

Unit-II

Work study, Definitions, objectives of method study and time study. Steps in conducting method study. Symbols and charts used in method study. Principles of motion economy. Calculation of standard time by time study and work sampling. Performance rating factor. Types of ratings. Jobs evaluation and performance appraisal. Wages, incentives, bonus, wage payment plans.

Unit-III

Inspection and quality control: Types and objectives of inspection S.Q.C., its principles. Quality control by chart and sampling plans. Quality circles, introduction to ISO.
Production planning and control: Types of manufacture. Types of production. Principles of PPC and its function. Production control charts.

Unit-IV

Optimisation: Introduction to linear programming and graphical solutions. Assignment problems.
Project Management: Introduction to CPM and PERT. Determination of critical path.
Material Management: Classification of materials. Materials planning. Duties of purchase manager. Determination of economic ordering quantities. Types of materials purchase.

Unit-V

Cost accounting: Elements of cost. Various costs. Types of overheads. Break even analysis and its applications. Depreciation. Methods of calculating depreciation fund. Nature of financial management. Time value of money. Techniques of capital budgeting and methods. Cost of capital. Financial leverage.

Suggested Reading:

1. Pandey 10M. "Elements of Financial Management", Vikas Publ. House, New Delhi,1994.
2. Khanna C.P., "Industrial Engineering and Management", Dhanapat Rai & Sons.