JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem	L	T/P/D	C
	4	-/-/-	4

(A80336) AUTOMATION IN MANUFACTURING

UNIT – I

Introduction: Types and strategies of automation, pneumatic and hydraulic components circuits, Automation in machine tools. Mechanical feeding and too changing and machine tool control transfer the automaton.

UNIT – II

Automated flow lines : Methods or work part transport transfer Mechanical buffer storage control function, design and fabrication consideration.

Analysis of Automated flow lines: General terminology and analysis of transfer lines without and with buffer storage, partial automation, implementation of automated flow lines.

UNIT – III

Assembly system and line balancing : Assembly process and systems assembly line, line balancing methods, ways of improving line balance, flexible assembly lines.

UNIT –I V

Automated material handling : Types of equipment, functions, analysis and design of material handling systems conveyor systems, automated guided vehicle systems.

Automated storage systems, Automated storage and retrieval systems; work in process storage, interfacing handling and storage with manufacturing.

UNIT – V

Fundamentals of Industrial controls: Review of control theory, logic controls, sensors and actuators, Data communication and LAN in Manufacturing

Business process Re-engineering: Introduction to BPE logistics, ERP, Software configuration of BPE.

TEXT BOOK:

1. Automation, Production Systems and Computer Integrated Manufacturing : M.P. Groover 3e./PE/PHI, 2009.

REFERENCES:

1 Computer Aided Manufacturing, Tien-Chien Chang, Richard A. Wysk and Hsu-Pin Wang, Pearson, 2009.

2 Automation by W. Buekinsham.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem	L	T/P/D	C
	4	-/-/-	4

(A82914) MEMS DESIGN
(Elective-III)

UNIT – I

Introduction, Integrated Circuits, MEMS, Micro sensors, Microactuators, Microelectronics Fabrication, Micromachining, Mechanical MEMS, Thermal MEMS, MOEMS, Magnetic MEMS, RF MEMS, Microfluid systems, Bio and Chemo-devices, Nanotechnology, Modeling and Simulation.

Micromachining: Introduction, Photolithography, Structural and sacrificial Materials, other Lithography methods, Thin film deposition, Impurity doping, Etching, Problems with bulk Micro machining, Surface Micromachining, Bulk Vs. Surface micromachining.

UNIT – II

System Modeling and Properties of Material: Introduction, Need for modeling, system types, Basic Modeling elements in mechanical systems, Electrical systems, Fluid systems and Thermal systems, Translational pure mechanical system with spring, damper and mass-Rotational pure mechanical system with spring, damper and mass.

Passive components and systems: Introduction, System-on-a-chip, Passive electronic systems, Passive mechanical systems.

UNIT – III

Mechanical Sensors and Actuators: Introduction, Principles of sensing and actuation, Beam and cantilever, Micro plates, Capacitive Effects, Piezo electric material as sensing and actuating elements, strain measurement, pressure measurement, Flow measurement using Integrated paddle-cantilever structure.

Thermal Sensors and Actuators: Introduction, Thermal energy basics and heat transfer processes, Thermistors, Thermo devices, Thermocouple, Micromachined thermocouple probe, Peltier effect heat pumps, Thermal flow sensors, Micro hot plate gas sensors, Shape memory Alloys, U-shaped horizontal and vertical Electrothermal Actuator, Thermally activated MEMS Relay.

UNIT – IV

Micro-opto-Electromechanical systems: Introduction, fundamental principle of MOEMS Technology, Review on properties of Light, Light modulators, Beam Splitter, Microlens, Micro mirrors, Digital micro mirror device, Light detectors, Grating Light valve, Optical switch, Waveguide and tuning, Shear

– Stress measurement. Magnetic Sensors and Actuators.

UNIT – V

Radio frequency MEMS: Introduction, Review of RF-based communication systems, RF, MEMS, MEMS Inductors, Varactors, Tuner / Filter, Resonator, Clarification of Tuner, Filter, Resonator, MEMS Switches, Phase Shiffter, Microfluididic Systems, Introduction, Applications.

TEXT BOOKS:

1. MEMS, Nitaigour Premchand Mahalik, TMH.
2. MEMS & MICRO SYSTEMS Design and Manufacture, Tai-Ran HSU, TMH, 2006.

REFERENCES:

1. Mechatronics Systems Fundamentals – Rolf Isermann – Springer International Edition.
2. The Science and Engineering of Micro electronic Fabrication, 2nd Ed. By S.A. Cambell, Published by Oxford University Press (2001).
3. Fundamentals of Micro Fabrication : The science of Miniatirization, 2nd Edition by M.J. Madou, published by CRC press (2002).
4. Introductory MEMS: Fabrication and Applications by Adams, Thomas M, Layton Richard A., 1st Edition 2010 IBNL 978-0-387-09510-3, Springer.
5. Microsystems Design, Stephen D. Senturia, Springer International Edition.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem	L	T/P/D	C
	4	-/-/-	4

(A80366) PRODUCTION PLANNING AND CONTROL
(Elective – IV)

UNIT-I

Introduction: Definitions – objectives of production planning and control-functions of production planning and control-elements of production control-types of production- organization of production planning and control – internal organizations department.

UNIT-II

Forecasting – Importance of forecasting – types of forecasting, their uses-general principles of forecasting techniques- Qualitative methods and quantitative methods.

UNIT-III

Inventory management – Functions inventory- Relevant inventory cost- ABC analysis- VED Analysis- EOQ model – Inventory control systems – P- Systems and Q – Systems.

Introduction to MRP And ERP, LOB(Line of balance), JIT inventory, Japanese concepts.

UNIT- IV

Routing – Definition – routing procedure- Route sheets – Bill of material-factors affecting routing procedure. Schedule – definition – difference with loading.

Scheduling polices – techniques, standard scheduling methods- job shop, flow shop.

Line balancing, aggregate planning- methods for aggregate planning- Chase planning, expediting, control aspects.

UNIT-V

Dispatching – Activities of dispatcher- Dispatching procedure - follow up – definition – reasons for existence of functions – types of follow up, applications of computer in production planning and control.

TEXT BOOKS:

1. Production Planning and Control/ M.Mahajan/ Dhanpati rai & Co.
2. Production Planning and Control/ Jain & Jain/ Khanna publications.

REFRENCE BOOKS :

1. Production Planning and Control- Text & cases/ SK Mukhopadhyaya /PHI.
2. Production and operations Management/ R.Panneer Selvam/PHI.
3. Operations Management/Chase/PHI.
4. Operations management/ Heizer/Pearson.
5. Production and Operations Management(Theory and Practice)/Dipak Kumar Bhattacharyya/University Press.
6. Operations Management/S.N. Chary/TMH.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem

L	T/P/D	C
4	-/-/-	4

(A81406) CONCURRENT ENGINEERING

(Elective – II)

UNIT I

Introduction : Development of Concurrent Engineering. The mean and activity concepts and principles. Examples.

Concurrent Engineering Tools and Technologies: Changes in to Technologies, Tasks, Talents and times into well managed resources product developments.

UNIT – II

Research in Engineering design and manufacturing: Theory applications using the concurrent Engineering concepts and Principles.

Simultaneous design and all related processes of a product.

UNIT –III

The mission and vision of C.E: Computer optimized manufacturing (COM).The next generation of computer integrated manufacturing (CIM).

Global competitiveness and development of high quality product. Offline reliability.

UNIT –IV

Managing the concurrent Engineering: Contemporary Issues a modern Tools and methods Use of Computers and decision making. Reengineering concepts.

UNIT-V

Automated Quality Control Application of CMM, Basic concepts, Zero defect, 6 sigma concept, Tolerancing, Examples, DFMA, Rapid Prototyping.

TEXT BOOK:

1. Concurrent Engineering: Tools and Technologies for Mechanic Systems Design – Edward, J. Haug.

REFERENCES :

1. Research in Engineering Design : Theory, applications, and concurrent engineering : Vol. 7, No. 1, 1995.
2. Managing Concurrent Engineering. – Jon Turino.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem

L	T/P/D	C
4	-/-/-	4

(A80364) PLANT ENGINEERING AND MAINTENANCE

(Elective – II)

UNIT – I:

Introduction: Need for maintenance, Facts and Figures, modern maintenance, problem and maintenance strategy for the 21st century, Engineering maintenance objectives and maintenance in equipment Life cycle, Terms and definitions.

Maintenance Management and control: Maintenance Manual, Maintenance, Facility evaluation, Functions of Effective Maintenance Management, Maintenance project control Methods, Maintenance Management control Indices.

UNIT – II

Types of maintenance: Preventive Maintenance, Elements of Preventive, Maintenance Program, Establishing Preventive Maintenance program, PM program Evaluation and Improvement, PM measures, PM models, Corrective Maintenance, Corrective Maintenance types, Corrective Maintenance steps and downtime components, Corrective Maintenance measures, Corrective Maintenance models.

Inventory control in Maintenance: Inventory control objectives and basic inventory decisions, ABC Inventory control method, Inventory control models Two bi Inventory control and safety stock, Spares determination factors, spares calculation methods.

UNIT –III

Quality and Safety in Maintenance: Needs for quality Maintenance processes, Maintenance work quality, use of quality control charts in Maintenance work sampling, post Maintenance testing, reasons for safety problems in Maintenance, guidelines to improve safety in Maintenance work, safety officer's role in Maintenance work, protection of Maintenance workers.

UNIT -IV

Maintenance costing: reasons for Maintenance costing, Maintenance budget preparation methods and steps, Maintenance labor cost estimation, material cost estimation, equipment life cycle Maintenance cost estimation, Maintenance cost estimation models.

UNIT – V

Reliability, Reliability centered Maintenance: RCM goals and principles, RCM process and Associated Questions, RCM Program components Effectiveness

Measurement indicators, RCM benefits and Reasons for its failures, Reliability versus Maintenance and Reliability in support phase, Bathtub Hazard Rate Concept, Reliability Measures and Formulas, Reliability Networks, Reliability Analysis Techniques.

Maintainability: Maintainability Importance and objective, Maintainability in systems Life cycle, Maintainability.

Design characteristics, Maintainability functions and measures, common Maintainability design errors.

TEXT BOOKS:

1. Engineering Maintenance a modern approach B.S. Dhallon 2002 C.R.R. Publichers.
2. Maintenance Engineering and management – K. Venkataraman - PHI.

REFERENCE BOOKS:

1. Reliability Engineering – Balaguruswamy.
2. Reliability Engineering – L.S. Srinath.
3. Industrial Safety Management – L.M. Deshmukh – TMH.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem

L	T/P/D	C
4	-/-/-	4

(A80527) ARTIFICIAL NEURAL NETWORKS

(Elective – IV)

UNIT- I

Introduction - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks.

Learning Process – Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process.

UNIT- II

Back Propagation: back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning.

UNIT- III

Single Layer Perceptrons: Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron – convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment.

Multilayer Perceptron – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection.

UNIT- IV

Self Organization Maps: Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification.

UNIT- V

Neuro Dynamics: Dynamical systems, stability of equilibrium states, attractors, neuro dynamical models, manipulation of attractors as a recurrent network paradigm.

Hopfield Models – Hopfield models, computer experiment.

TEXT BOOK:

1. Neural networks: A comprehensive foundation/ Simon Hhaykin/ PHI.

REFERENCES:

1. Artificial neural networks/ B.Vegnanarayana/PHI.
2. Neural networks in Computer intelligence/ Li Min Fu/ TMH/2003.
3. Neural networks/ James A Freeman David M S kapura/ Pearson education/2004.
4. Introduction to Artificial Neural Systems/Jacek M. Zurada/JAICO Publishing House Ed. 2006.

www.universityupdates.in

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem

L	T/P/D	C
4	-/-/-	4

(A80019) MATHEMATICAL MODELING AND SIMULATION

(Elective – IV)

UNIT I

Art of Modeling, Types of models, mathematical models – solution methods – analytical, Numerical and Heuristic. L.P.P. – Formulation – Graphical Method, simplex method, dual simplex method and application.

Transportation models – Assignment models, Integer programming, Non-linear programming.

UNIT – II

Deterministic Inventory models – General Inventory model, Static E.O.Q. Models, Dynamic Inventory model, Probabilistic Inventory models, continuous Review models, single period model and multiple period model.

Selective Inventory control – ABC, VED, FSN Analysis. Inventory systems – Fixed order quantity system, two bin system, periodic review systems, Optional Replenishment system and M R P.

UNIT –III

Queuing Theory – Basic Structure of Queuing Models, Role of Exponential Distribution, Birth-and-Death Process, Queuing Models Based on the Birth-and- Death Process, Queuing Models involving Non-exponential Distributions, Priority-Discipline Queuing Models and Queuing Networks. Applications of Queuing Theory – Decision Making, Formulation of Waiting – Cost Function and Decision Models.

UNIT – IV

CPM and PERT – Network Representation, Critical path calculation, construction of Time schedule.

Simulation – Introduction, General principles, Random-Number Generation, Random-Variate Generation, Simulation Software.

UNIT – V

Input modeling, verification and validation of simulation models, Output Analysis for a single model, Comparison and Evaluation of Alternative System Designs, Simulation of Computer Systems.

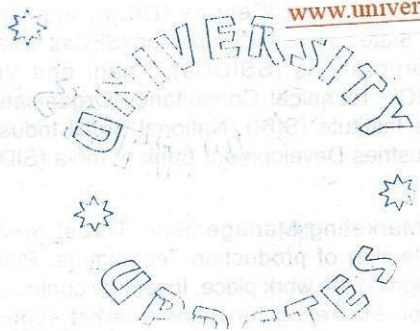
TEXT BOOKS:

1. Introduction to Operations Research, Frederick S Hiller and Gerald J Lieberman, 7th Edition, Tata McGrawHill, 2001 (Chapters 17 and 18 for Unit-III).

2. Discrete-Event System Simulation, Jerry Banks, John S Carson II, Barry L. Nelson and David M. Nicol, 3rd edition, PHI/Pearson Education (Chapters1,3,4,7 and 8 for Unit-IV; Chapters 9,10,11,12 and 14 for Unit-V).
3. Operations Research – An Introduction, 7th edition, Prentice-Hall of India, 1999 (Chapter 1 to 5 for Unit-I and Chapters 11 and 16 for Unit II, Section 6.7 for Unit-IV).

REFERENCE BOOKS:

1. Operation Research – S.K.Jain and D. M. Mehta, Galgotia.
2. Introductory Operations Research: Theory & Applications, Kasana, Springer.
3. Applied Simulation Modelling – Seila, Ceric and Tadikamalla.
4. Simulation Maodeling and Analysis – Averil M Law – TMH.
5. Operation Research – An Introduction 7th Edition, Prentice Hall of india, 1999 (Chapter 1 to 5 for Unit – I and Chapters 11 and 16 for Unit II, Section 6,7 for Unit – IV).



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem

L	T/P/D	C
4	-/-/-	4

(A80129) PRINCIPLES OF ENTREPRENEURSHIP
(Elective-IV)

UNIT I:

Introduction to Entrepreneurship: Definition of Entrepreneur Entrepreneurial Traits. Entrepreneur vs. Manager, Creating and Starting the venture: Sources of new ideas, methods of generating ideas, creative problem solving - Writing Business Plan, Evaluating Business Plans. Launching formalities.

UNIT II:

Financing and Managing the new venture: Sources of capital, Record keeping, recruitment, motivating and leading teams, financial controls. Marketing and sales controls. E-commerce and entrepreneurship, Internet advertising- New venture Expansion Strategies and Issues.

UNIT III:

Institutional/financial support: Schemes and functions of Directorate of Industries, District Industries Centres (DICs), Industrial Development Corporation (IDC), State Financial Corporation (SFCs), Small Scale Industries Development Corporations (SSIDCs), Khadi and Village Industries Commission (KVIC), Technical Consultancy Organisation (TCO), Small Industries Service Institute (SISI), National Small Industries Corporation (NSIC), Small Industries Development Bank of India (SIDBI).

UNIT IV:

Production and Marketing Management: Thrust areas of production management, Selection of production Techniques, Plant utilization and maintenance, Designing the work place, Inventory control , material handling and quality control. Marketing functions, market segmentation, market research and channels of distribution, Sales promotion and product pricing.

UNIT V :

Labour legislation, Salient Provisions of Health, Safety, and Welfare under Indian Factories Act, Industrial Disputes Act, Employees State Insurance Act, Workmen's Compensation Act and Payment of Bonus Act.

TEXT BOOKS:

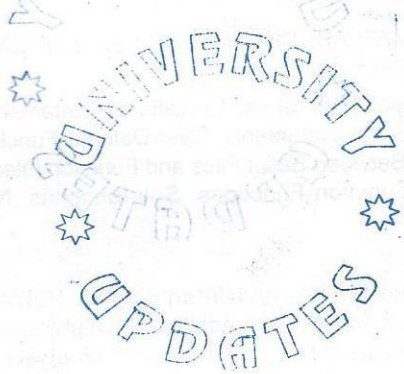
1. Robert Hisrich, & Michael Peters: Entrepreneurship, TMH, 2009.
2. Dollinger: Entrepreneurship, Pearson, 2009.

REFERENCE BOOKS:

1. Vasant Desai, Dynamics of Entrepreneurial Development and

Management, Himalaya Publishing House, 2009.

2. Harvard Business Review on Entrepreneurship, HBR Paper Back.
3. Robert J.Calvin: Entrepreneurial Management, TMH, 2009.
4. Gurmeet Naroola: The entrepreneurial Connection, TMH,2009
5. Bolton & Thompson: Entrepreneurs—Talent, Temperament and Techniques, Butterworth Heinemann, 2009.
6. Agarwal: Indian Economy, Wishwa Prakashan 2009.
7. Dutt & Sundaram: Indian Economy,S.Chand, 2009.
8. B D Singh,:Industrial Relations & Labour Laws, Excel, 2009.
9. Aruna Kaulgud: Entrepreneurship Management by, Vikas publishing house, 2009.
10. Essential of entrepreneurship and small business management by Thomas W.Zimmerer & Norman M.Searborough, PHI-2009.
11. ND Kapoor: Industrial Law, Sultan Chand & Sons, 2009.



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem

L	T/P/D	C
4	-/-/-	4

(A81407) MATLAB APPLICATIONS

(Elective – IV)

UNIT I:

Starting with MATLAB: Command Window, Arithmetic Operations, Display Formats, Built-In Functions, Variables, Useful Commands, Script Files, Examples of MATALAB Applications.

UNIT II:

Arrays and Mathematical Operations: One and two-dimensional Array, zero's ones and, eye Commands, Array Addressing, Vector Matrix, Strings and Strings as Variables.

Addition, Subtraction, Multiplication and Array Division, Built-in MATH Functions, Generation of Random Numbers, Script File operations, Examples.

UNIT III:

Programming in MATLAB: Plot, line, hold on and hold off Commands, Formatting a Plot, Polar Plots.

Relational and Logical Operators, Conditional Statements, Nested Loops and Nested Conditional Statements, User-Defined Functions and Function Files, Comparison Between Script Files and Function Files, Anonymous and Inline Functions, Function Functions, Sub-functions, Nested Functions, Examples.

UNIT IV:

Polynomials, Curve Fitting, and Interpolation: Polynomials, Value of Polynomial, Roots of Polynomial, Addition, Multiplication, Derivatives and Division of Polynomials, Curve Fitting Curve Fitting with Polynomials, The polyfit Function.

UNIT V:

Applications in Numerical Analysis: One variable, Integration, Ordinary Differential Equations, Mesh, surface, special graphs, view commands, symbolic objects and expressions, algebraic equation, differentiation, integration, Examples.

TEXT BOOKS

1. MATLAB An Introduction with Applications, 4th Edition, Amos Gilat, WILEY Publishers.

2. MATLAB Programming for Engineers, 4th Edition, Stephen J. Chapman, CENGAGE. Publishers.

REFERENCES

1. Essential-MATLAB for Engineers and Scientists, 4th Edition, Brian H. Hahan and Daniel T. Valentine, Elsevier Publications.

2. MATLAB-A practical Introduction to programming and problem solving, 2nd Edition, Stormy Attaway, Elsevier BH.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem	L	T/P/D	C
	-	-/-/-	2

(A80087) INDUSTRY ORIENTED MINI PROJECT

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem	L	T/P/D	C
	-	-/6/-	2

(A80089) SEMINAR

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem	L	T/P/D	C
	-	-/15/-	10

(A80088) PROJECT WORK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. MC-II Sem	L	T/P/D	C
	-	-/-/-	2

(A80090) COMPREHENSIVE VIVA