SWAMI VIVEKANAND UNIVERSITY, SIRONJA, SAGAR (M.P.)



SYLLABUS

For

M.Tech. Advance Production System Course Code :MTPE

Department of Mechanical Faculty of Engineering

Duration of Course : 2 Year

Examination Mode : Yearly

Examination System : Grading

Swami Vivekanand University, Sironja Sagar (M.P.)



Advance Mathematics (MTPE-0101)

		Pe	eriods	Per we	eek				Di	stributio	n of Ma	rks			
							Th	eory			P	ractic	al	То	C 1
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	Total ($e=$ a+c+ d)	Max (f)	M in (g)	TW (h)	tal (i= f+ h)	Total (j= e+i)
MTPE	Advance	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

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

UNIT- II

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

UNIT- III

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

UNIT- IV

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



UNIT- V

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

Text Books

1.ENGINEERING MATHEMATICS - B.S. GRAWL

- 1. Higher Engineering Mathematics by B.V. Ramana, Tata Mc Hill.
- 2. Advance Engineering Mathematics by Ervin Kreszig, Wiley Easten Edd.
- 3. Applied Numerical Methods with MATLAB by Steven C Chapra, TMH.
- 4. Advance Engineering Mathematics, O'Neil, Cengage (Thomson)
- 5. Introductory Methods of Numerical Analysis by S.S. Shastry,
- 6. Krishmurthy Finite element TMH
- 7. Buchanan Finite element analysis(Schaum Outline S) TMH
- 8. Numerical Solution of Differential Equation by M. K. Jain
- 9. Numerical Mathematical Analysis By James B. Scarborogh
- 10. Fourier Transforms by J. N. Sheddon
- 11. Advance Mathematics for Engr and Sc, Spiegel, Schaum Series, TMH



Advances in Manufacturing Technology (MTPE-0102)

		Pe	eriods	Per w	eek				Dis	tributic	on of M	arks			
							Theo	ory		Tot	P	ractic	al	То	Grand
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	al (e= a+c +d)	Ma x (f)	M in (g)	TW (h)	$ \begin{array}{c} \text{tal} \\ (i) \\ = \\ f+ \\ h) \end{array} $	Total (j= e+i)
MTPE 0102	Advances in Manufacturi ng Technology	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

METAL CUTTING AND TOOL MATERIALS: Orthogonal and oblique cutting -Types of tool wear, Abrasion. Diffusion, Oxidation. Fatigue and Adhesive wear - Prediction of tool life -Monitoring of tool wear, Cutting forces and vibration - Tool materials, cemented carbide, Coated carbide, Cermet, Ceramic, CBN and PCD - Selection of machine parameters and Tools

UNIT- II

SPECIAL MACHINING: Deep hole drilling - Gun drills - Gun boring – Trepanning – Honing - Lapping - Super finishing - Burnishing - Broaching - High speed machining.

UNIT- III

UNCONVENTIONAL MACHINING: Principles, processes, Various influencing parameters and Applications of - Ultrasonic machining, Electro Discharge Machining, Electro Chemical Machining, Electron and Laser Beam Machining, Plasma Arc Machining and Water Jet Machining..

UNIT- IV

RAPID PROTOTYPING: Stereo lithography - Laminated object manufacturing – selective laser sintering - solider - Vacuum casting - Resin injection - Applications of RPT - Surface roughness terms - Influence of machining' parameters on surface roughness - Micro finishing process..

UNIT- V

ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS: Introduction – Pattern recognition - Control strategies - Heuristic search, Forward and Backward reasoning – Search algorithms - Game playing- Knowledge representation - structural representation of knowledge -Expert systems in manufacturing.



Text Books

- 1. Armarego E.J:A. and Brown RH., "The machining of metals ", Prentice Hall
- 2. Battacharya," Theory of metal cutting ", NCB Agency
- 3. HMT Manual, "Non-traditional machining methods "
- 4. RichE. and KnightK, "Artificial Intelligence ", TMH
- 5. Pham D.7:, "Expert S~stems in ~ngineering ", IFS Publishers, Springer- Verlag
- 6. Durvent WR, "The Lithographic handbook ", Narosa Publishers, 1995.
- 7. Pandey P.S. and Shah N. "Modern Manufacturing Processes ", /980.
- 8. Sadasivan TA. and Sarathy D. "Cutting tools for Productive Machining ", Widia P



Computer Integrated Manufacturing (MTPE-0103)

		Р	eriods	Per we	ek				Di	stributio	on of Ma	ırks			
							The	ory		Tota	Р	ractic	al	Tot	
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	$ \begin{array}{c} 1\\ (e=\\ a+c\\ +d) \end{array} $	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0103	Computer Integrated Manufacturing	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

Computer Integrated manufacturing SystemDefinition, CIM wheel concept, Evolution of ('1M, CIM and system view of manufacturing, and CIM IT & Concurrent Engineering, Elements of CIM syste CIM hardware and software. $\$

UNIT-II

Computer Aided DesignHistorical background, Development of CAD, CAD system hardware, Software, Graphics standards, Basic definitions, Modes of graphic operation, User interface, Software modules, Modeling and viewing

UNIT-III

2D - Representation and Transformation of Points - -transformation of Lines –Rotatio Reflection. Scaling and combined transformations - 3Dsealing - shearing - Rotation - Reflection -Translation - Projections parametric representation of Ellipse, Parabola, Hyperbola.

UNIT-IV

Wire frame, Surface and Solid modeling - Solid modeling packages - FiniteElement Analysis (FEA) -Introduction and procedures - Solution Techniques - Introduction to (-'EA packages.

UNIT- V

Manufacturing Planning and Control - CAD/CAM Integration - Principles of Computer Integrated Manufacturing - Hierarchical Network of Computers - Local Area Networks – Process Planning: Computer Aided Process Planning - Retrieval and Generative approachesCNC Machine Tool and ProgrammingDevelopment of CNC Technology, Principles, Fatures, NC,CNC,ONC concepts, Classification of CNC Machine Tools, CNC Controller, CNC Programming for various. Controllers -SI numeric, Fanuc Program, G&M codes, Part Programming of Prismatic and revolved components, APT part programming using CAD, CAM S/w.

Reference Books

I. Groover, Production System & CIM: PHI 2. Zeid, CAD/CAM Theory & Practice: Mc Graw Hill



Computer Aided Process Planning (MTPE-0104)

		Р	eriods	Per we	ek				Di	stributio	on of Ma	ırks			
							Theo	ory		Tota	P	ractic	al	Tot	
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	$ \begin{array}{c} 1\\ (e=\\ a+c\\ +d) \end{array} $	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0104	Computer Aided Process Planning	3	1	-	4	70	22	20	10	100	-	-	_	-	100

UNIT- I

INTRODUCTION: The Place of Process Planning in the Manufacturing cycle – Process Planning and Production Planning - Process Planning and Concurrent Engineering, CAPP, Group Technology

UNIT-II

PART DESIGN REPRESENT A TION: Design Drafting - Dimensioning – Conventional tolerancing - Geometric tolerancing - CAD - input / output devices - topology '- Geometric transformation - Perspective transformation - Data structure - Geometric modelling for process planning - GT coding - The optiz system - The MICLASS system.

UNIT- III

PROCESS ENGINEERING AND PROCESS PLANNING: Experienced, based planning - Decision table and decision trees - Process capability analysis - Process Planning - Variant process planning - Generative approach - Forward and Backward planning, Input format, AI..

UNIT- IV

COMPUTER AIDED PROCESS PLANNING SYSTEMS:

Logical Design of a Process Planning - Implementation considerations -manufacturing system components, production Volume, No. of production families - CAM-I, CAPP, MIPLAN, APPAS, AUTOPLAN and PRO, CPPP.

UNIT- V

AN INTERGARTED PROCESS PLANNING SYSTEMS: Totally integrated process planning systems - An Overview - Modulus structure - Data Structure, operation – Report Generation, Expert process planning.



Text Books

Reference Books

1. Gideon Halevi and Roland D. Weill, "Principles of Process Planning ", A logical approach, Chapman & Hall, 1995.

2. Tien-Chien Chang, Richard A. Wysk, "An Introduction to automated process planning systems ", Prentice Hall, 1985.

- 3. Chang, T.C., " An Expert Process Planning System ", Prentice Hall, 1985.
- 4. Nanua Singh, "Systems Approach to Computer Intergrated Design and Manufacturing ", John Wiley & Sons, 1996.
- 5. Rao, "Computer Aided Manufacturing ", Tata McGraw Hill Publishing Co., 2000Hills.



Manufacturing Automation And Mechatronics (MTTE-0105)

		Р	eriods	Per we	ek				Di	stributio	on of Ma	ırks			
							Theo	ory		Tota	Р	ractic	al	Tot	Caral
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	$ \begin{array}{c} 1\\ (e=\\ a+c\\ +d) \end{array} $	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0105	Manufacturin g Automation And Mechatronics	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

Fundamental of Manufacturing and Automation ,;

Manufacturing industries, Types of production, Function in manufacturing, Orgnisaton & Informatio:1 process in manufacturing, Plant layout, Production concept and mathematical model automation strategies.

UNIT-II

Analysis of Automated Flow Lines Terminology, Analysis of transfer lines, Partial automation, Automated flow lines with storage buffers, Computer simulation of automated flow lines.

UNIT- III

Automated Assembling System

Design for automated assembly, types of automated assembly, Past feeding devices, Analysis of multi-station assembly M/c, Analysis of single station assembly m/C.

UNIT- IV

Mechatronics

Introduction to Mechatronics - Systems - Mechatronics in Products - Measurement Systems -Control Systems -Traditional design and Mechatronics Design...

UNIT- V

Sensors & Transducers

Introduction - Performance Terminology - Displacement, Position and Proximity - Velocity and Motion - Fluid pressure - Temperature sensors - Light sensors - Selection of sensors - Signal processing - Servo systems.

Reference Books

Reference Books: I. Groover, Production System & CIM: PHI 2. Zeid, CAD/CAM Theory & Practice: Mc Graw Hills



lab-I (MTPE-0106)

		P	Periods	Per we	ek				1	Distribu	tion of N	/larks			
							Th	eory		Tota]	Practica	1		Caral
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	$ \begin{array}{c} 1\\ (e=\\ a+c\\ +d) \end{array} $	Max (f)	Min (g)	TW (h)	Tota l (i= f+h)	Total (j= e+i)
MTPE 0106	Lab-I	-	-	6	6	-	-	-	-	-	90	28	60	150	150

List of Experiments



lab-II (MTPE-0107)

		P	Periods	Per we	ek				D	istributi	on of M	arks			
							Theo	ory		Tota	Р	ractic	al		Grand
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	$ \begin{array}{c} 1 \\ (e=\\ a+c\\ +d) \end{array} $	Max (f)	M in (g)	TW (h)	Tota l (i= f+h)	Total (j= e+i)
MTPE 0107	Lab-II	-	-	6	6	-	-	-	-	-	90	28	60	150	150

Course: MMTP-107 THERMAL ENGG. LAB – II

1. To Determine Volume Flow Rate for Low Speed Wind Tunnel using Pitot Tube.

- 2. To study Flow around Circular/Irregular Shaped Body.
- 3. Heat Balance Sheet for C.I./I.C Engines.
- 4. To find effect of compression ratio on I.C. Engine Performance.
- 5. Study of Experimental Facility on Steam Turbine.
- 6. To conduct Numerical Experiments with Software for exploration of problems relat





Supply Chain Management (MTPE-0201)

		Pe	eriods	Per we	eek				Dis	tributio	on of M	arks			
							Theo	ory		Tot	P	ractic	al	То	Caral
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	al ($e=$ a+c +d)	Max (f)	M in (g)	TW (h)	tal (i= f+ h)	Total (j= e+i)
MTPE 0201	Supply Chain Management	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

Logistics - Concepts, Definitions. approaches, factors affecting logistics. Supply chain - basic tasks of the supply chain - the new corporate model.

UNIT- II

SUPPLY CHAIN MANAGEMENT: The new paradigm, the modular company, the network relations. supply process, Procurement process - Distribution management •

UNIT- III

EVOLUTION OF SUPPLY CHAIN MODELSL: Strategy and structure - factors of supply chain - Manufacturing strategy stages, supply chain progress - model for competing through supply chain management - PLC grid, supply chain redesign - Linking supply chain with customer

UNIT- IV

SUPPLY CHAIN ACTIVITY SYSTEMS: Structuring the SC, SC and new product, functional roles in SC, SC design frame-work, collaborative product commerce (CPC).

UNIT- V

SCM ORGANISATION AND INFORMATION SYSTEM: The management task, logistics organisation, the logistics information systems -Topology of SC application - MRP, ERP, Warehouse management system, product data management - cases.

- 1. Scharj, P.B., Lasen, TS., Managing the global supply chain , Viva books, New Delhi
- 2. Ayers, J:B., "Hand book of supply chain management ", The St. Lencie press, 2000.
- 3. Nicolas, J:N., "Competitive manufacturing management-continuous improvement ", Lean production, customer focused quality, McGraw-Hill, NY; 1998.
- 4. Steudel, 11J: and Desruelle, P., "Manufacturing in the ninetees-How to become a mean, lean and world class competitor ", Van Nostrand Reinhold; NY, 1992.





FMS And FEA(MTPE-0202)

		Pe	eriods	Per w	eek				Di	stribut	ion of N	Mark	5		
							The	eory		Tot	P	ractic	al		Grand
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	al (e= a+c +d)	Ma x (f)	M in (g)	TW (h)	Total (i= f+h)	Total (j= e+i)
MTPE 0202	FMS And FEA	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

CM SystemConcurent engineering and design methodology, collaborative product development, Product data management for manufacturing and design data reuse product life cycle management, arid collaborative product, commerce, Advance manufacturing, Cellular, Synchronous Agile, Lear, Manufacturing system, concept of rapid prototyping, reverse engineering, re-engineering, case studies

UNIT- II

CM SystemConcurent engineering and design methodology, collaborative product development, Product data management for manufacturing and design data reuse product life cycle management, arid collaborative product, commerce, Advance manufacturing, Cellular, Synchronous Agile, Lear, Manufacturing system, concept of rapid prototyping, reverse engineering, re-engineering, case studies

UNIT-III

Basics of FEM - Initial value and boundary value problems - weighted residual, Galerkin and Raleigh Ritz methods - Review of Variational calculus -Integration by parts - Basics of Variational formulation

UNIT- IV

Steps In FEA - Descretization, interpolation, derivation of element characteristic matrix function, assembly and imposition of boundary conditions - Solution and post processing, One-dimensional analysis in solid mechanics and heat transfer

UNIT- V

Global and Natural co-ordinates - Shape functions for one and two dimensional elements – Three nodded triangular and four noded quadrilateral element - non linear analysis – Isoparametric elements - Jacobian matrices and transformations - Basics of two dimensional axi symmetric analysis

- 1. Vajpayee, Principles of CIM, PHI
- 2. Seshu, Text book of Finite Element Analysis



Operation Management (MTPE-0203)

		Р	eriods	Per we	ek				Di	stributio	on of Ma	urks			
							The	ory		Tota	P	ractic	al	Tot	
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	$ \begin{array}{c} 1\\ (e=\\ a+c\\ +d) \end{array} $	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0203	Operation Management	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

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

UNIT-II

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

UNIT-III

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

UNIT- IV

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

UNIT- V

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



- I1. Hop W, Spearman M; Factory Physics; TMH
- 2. Charry S.N.; Production & Operations Management; TMH.
- 3. Chase, Acquilino, Production & Operations Managment, TMH.
- 4. Eilon S. Production Planning and Control, McMillon Pub.
- 5. Vollmann; Mfg planning and control for SCM; TMH
- 6. Nahmias Steven; Production and Operations analysis; TMH
- 7. Bedi Kaniska; Production and Operations Management; Oxford Pub
- 8. Dobler & Lee, Purchasing & Materials Management, PHI.
- 9. Chitle A.K., Gupta R.C. Materials Management, PHI.
- 10. Monk Joseph; Schaum's outline of
- Operations Management; McGraw Hill



Robotics and Automated material Handling (MTPE-0204)

		Per	riods	Per w	reek				Di	stributio	on of Ma	ırks			
							Theo	ory		Tota	P	ractic	al	Tot	
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	1 $(e=$ $a+c$ $+d)$	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0204	Robotics and Automated material Handling	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

INTRODUCTION: Basic concepts - Robot anatomy - Robot configurations - Basic robot motions -Types of drives - Applications - Material handling - processing - Assembly and Inspection - safety considerations

UNIT-II

TRANSFORMATIONS AND KINEMATICS: Vector operations – Translational transformations and Rotational transformations - Properties of transformation matrices- Homogeneous transformations and Manipulator - Forward solution - Inverse solution.

UNIT-III

CONTROLS AND END EFFECTORS: Control system concepts - Analysis - control of joints - Adaptive and optimal control - End effectors - Classification - Mechanical - Magnetic -Vacuum - Adhesive - Drive systems - Force analysis and Gripper design.

UNIT-IV

SENSORY DEVICES: Non optical and optical position sensors - Velocity and Acceleration -Range -Proximity - touch - Slip - Force - Torque - Machine vision - Image components -Representation -Hardware - Picture coding - Object recognition and categorization – Software consideration

UNIT- V

Automated Material Handling and Storage: Functions types and analysis of material handling equipment, Design of conveyor and AGV system, Storage system performance, AS/RS, Carovsel storage system, WIP storage system, Interfacing handling, Storage with manufacturing



Reference Books

 Fu KS., GonzalezR.C.., and Lee C.S.G., "Robotics control, sensing, vision, and intelligence McGraw-Hill Book Co., 1987.
 Klafter R.D., Chmielewski TA. and Negm IV. .. Rohot Engineering An Intergrated approach Prentice Hall of India, New Delhi, 1994
 Deb S.R., "Robotics Technology and Fle.rihle Auto"w(i('fl ", Tata McGraw-Hill Publishing Co., Ltd., 1994.
 Craig J..J. "Introduction to Robotic.s Mechanics and Control ". Addison-Wesley, 1999.

5. Groover MP.. "/ndu.slriul roholic.s Technol()g}'. programming and application. McGraw-Hill Book



Reliability and total productive maintenance (MTTE-0205)

		Р	eriods	Per we	ek				Di	stributio	on of Ma	rks			
							Theo	ory		Tota	Р	ractic	al	Tot	C
Course Code	Title of the Paper	L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	1 $(e=$ $a+c$ $+d)$	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0205	Reliability and total productive maintenance	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

INTRODUCTION: Reliability function - MTBF - MTTF - mortality curve - availability - Maintainability

UNIT- II

FAILURE DATA ANALYSIS: Repair time distributions - exponential, normal, log normal. gamma,

and W eibull- reliability data requirements - Graphical evaluation

UNIT- III

RELIABILITY PREDICTION: Failure rate estimates - Effect of environrl:1ent and stress - Series and Parallel systems - RDB analysis - Standby Systems - Complex Systems.

UNIT- IV

RELIABILITY MANAGEMENT: Reliability demonstration testing - Reliability growth testing - Duane curve -Risk assessment - FMEA, Fault tree.

... UNIT- V

TOTAL PRODUCTIVE MAINTENANCE: Causes of Machine Fialures - Downtime -Maintenance policies - Restorability predictions - Replacement models - Spares provisioning -Maintenance management - Cleanliness and House Keeping..

Reference Books

Reference Books:

1. Paul Kales, Reliability for technology, "En.", ineerin't'!; and Mana't'!; emefif ", Prentice Hall, New Jersey, 1998.

2. Modarres, "Reliability and Risk Analysis ", MeralDekkerlnc., 1993.

3. Gopalakrishnan.P, and Banerji A.K., "Maintenance and ,<; 'pare Parts Management ", Prentice Hall of India, New Delhi, 1996



Lab-III (MTPE-0206)

	Title of the Paper	Р	eriods	Per we	eek	Distribution of Marks									
Course Code							Th	eory	Tota		Practical				Crond
		L	Т	Р	C	Max (a)	Mi n (b)	MS T (c)	TW (d)	1 $(e=$ $a+c$ $+d)$	Max (f)	M in (g)	TW (h)	Tota l (i= f+h)	Total (j= e+i)
MTPE 0206	Lab-III	_	-	6	6	-	-	-	-	-	90	28	60	150	150



Lab-IV (MTPE-0207)

	Title of the Paper	P	eriods	Per we	ek			Distribution of Marks								
Course Code							Th	eory		Tota	Practical				Gunt	
		L	L T	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	1 $(e=$ $a+c$ $+d)$	Max (f)	M in (g)	TW (h)	Total (i= f+h)	Total (j= e+i)	
MTPE 0207	Lab-IV	-	-	6	6	-	-	-	-	-	90	28	60	150	150	



CNC Machine (MTPE-0301(A))

Course Code	Title of the Paper	Pe	riods	Per w	/eek										
							Th	eory		Tota	P	ractic	al	Tot	Crond
		L	Т	Р	С	Max (a)	Mi n (b)	MS T (c)	TW (d)	1 (e= a+c +d)	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0301A	CNC Machine	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

INTRODUCTION TO CNC MACHINE TOOLS: Development of CNC Technology, principles, features, advantages, economic benefits, applications, CNC, DNC concept, classification of CNC Machine, types of control, CNC controllers, characteristics, interpolators.

UNIT- II

STRUCTURE OF CNC MACHINE TOOL: CNC Machine building, structural details, configuration and design, guide ways - friction and anti friction and other types of guide ways, elements used to convert the rotary motion to a linear motion - Screw and nut, recalculating roller screw, planetary roller screw, recalculating roller screw, rack and pinion, torque transmission elements - gears, timing belts, flexible couplings, Bearings.

UNIT-III

DRIVES AND CONTROLS: Spindle drives - DC shunt motor, 3 phase AC induction motor, feed drives - stepper motor, servo principle, DC & AC servomotors. Open loop and closed loop control, Axis measuring system - synchro, synchro-resolver, gratings, moire fringe gratings, encoders, inductosyn, laser interferometer.

UNIT- IV

. CNC PROGRAMMING: Coordinate system, structure of a part program, G & M Codes, Manual part programming for Fanuc, Heidenhain, Sinumeric control system, CAPP, APT part programming using CAD/CAM, Parametric Programming

UNIT- V

TOOLING AND MAINTENANCE OF CNC: Cutting tool materials, carbide insets classification, qualified, semi qualified and preset tooling, tooling system for Machining centre and Turning centre, work holding devices, maintenance of CNC Machines



- 1. HMT. Mechatronics. Tata McGraw-Hill Publishing Company Limited, New Delhi
- 2. James Madison. "CNC Machining Hand Book ". Industrial Press Inc.. 1996.
- 3. Steve Krar, Arthur Gill. "CNC Technology and Programming ", McGraw-Hill
- 4. Berry Leathan, Jones, Introduction to Computer Numerical Control, Pitman. London
- 4, Hans B.Kiej, 7:Fredericx Waters, "Computer Numerical Control ", MacMillan McGraw
- 5, Bernard Hodgers, "CNC Part Programming Work Book ". cizv and Guid, Macmillan
- 6. David Gribbs, "An Introduction to CNC Machining ", Ca,\".\'ell, /9R7,
- 7, Sadasivan. 7:A, and .S'arathy, D., "Cutting Tools for Productive Machining, Widia P
- 8. Radhakrishnan. P. "Computer Numerical Control Machines ". New Central Book Ag
- 9. Peter Smid, "CNC Programming Hand Book ", Industrial Press Inc., 2000.Web



MIS & ERP (MTPE-0301(B))

Course Code	Title of the Paper	Pe	riods	Per w	/eek										
							Th	eory		Tota	P	ractic	al	Tot	Crond
		L	Т	Р	C	Max (a)	Mi n (b)	MS T (c)	TW (d)	$ \begin{array}{c} 1\\ (e=\\ a+c\\ +d) \end{array} $ Matrix	Max (f)	M in (g)	TW (h)	al (i= f+h)	Total (j= e+i)
MTPE 0301B	MIS & ERP	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

Management Information System (MIS) definition, Objectives and benefits, MIS as strategic tool, obstacles and challenges for MIS, functional and cross functional systems, hierarchical view of CBIS, structured and unstructured decision, Operation and mgt support, Decision process and MIS, info system components and activities, Value chain and MIS support.

UNIT- II

System concepts: types, definition, characteristics, feedback (Pull) and feed-forward (Push) control, system stress and entropy, computer as closed system, law of requisite variety, open and flexible (Adaptive) systems, work system model and comparison with input-process-output model, five views of work system: structure, performance, infrastructure, context and risk and their effect on product performance.

UNIT-III

Info concepts: define data, info, knowledge, intelligence and wisdom. Information characteristics and attributes, info measurement and probability, characteristics of human as info processor.

UNIT- IV

Planning and control Concepts: terminologies, difficulties in planning, system analysis and Development plan-purpose and participants, info planning, (SDLC) system development life cycle for in-house and licensed sw, system investigation, analysis of needs, design and implementation phases, training of Operational personnel, evaluation, Control and Maintenance of Information Systems.

UNIT- V

E-business components and interrelationship, Evolution of Enterprise Resource Planning (ERP) from MRP, Supply chain management (SCM) and Customer relationship management (CRM), Integrated data model, strategic and operational issues in ERP, Business Process Re-Engineering (BPR), significance and functions, BPR, information technology and computer NW support to MIS. ERP Implementation, role of consultants, vendors and users, customization, methodology of

ERP implementation and guidelines for ERP implementation, ERP modules.

- 1. Davis and Olson, MIS, TMH
- 2. James O' Brian, MIS, TMH
- 3. Business Process Re-Engineering, Jayaraman, TMH.
- 4. ERP by V.K. Garg, PHI



Flexible Competitive Mfg. System (MTPE-0302(A))

Course Code	Title of the Paper	P	Periods	Per we	ek	Distribution of Marks									
							The	ory		Tota	Р	ractic	Tot		
		L	Т	Р	C	Max (a)	Mi n (b)	MS T (c)	TW (d)	1 $(e=$ $a+c$ $+d)$	Max (f)	M in (g)	TW (h)	al (i= f+h)	Grand Total (j= e+i)
MTPE 0302A	Flexible Competitive Mfg. System	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

MANUFACTURING IN A COMPETITIVE ENVIRONMENT: Automation of manufacturing process -Numerical control - Adaptive control - material handling and movement- Industrial robots - Sensor technology flexible, fixturing - Design for assembly, disassembly and service.

UNIT- II

GROUP TECHNOLOGY: Part families - classification and coding - Production flow analysis - Machine cell design - Benefits

UNIT-III

FLEXIBLE MANUFACTURING SYSTEMS: introduction - Components of FMS - Application work stations - Computer control and functions - Planning, scheduling and control of FMS - Scheduling - Knowledge based scheduling - Hierarchy of computer control – Supervisory computer.

UNIT- IV

COMPUTER SOFTWARE, SIMULATION AND DATABASE oF FMS: System issues- Types of software - specification and selection - Trends – Application simulation - software - Manufacturing data systems - data flow - CAD/CAM considerations - Planning FMS database.

UNIT- V

JUST IN TIME: Characteristics of JIT - Pull method - quality -small lot sizes - work station loads - close supplier ties - flexible work force - line flow strat."b'Y' - preventive maintenance - Karban system - strategic implications -implementation issues - ~ARD liT - Lean manufacture.

Reference Books:

1. Groover MP., II Automation, Production System", un" Computer Integrated Manufacturing ", Prentice-Hall of India Pvt. Ltd., New Delhi, 1996

- 2. .fha, N.K. " Handbook of Flexible Manufacturinj!; Systems ", Academic Press Inc., 1991
- 3. Kalpakjian, "Manufacturing Engineering and Iechnology", Addison-Wesley Publishing Co. 1995.
- 4. Taiichi Ohno, Toyota, "Production System Beyond Large-Scale production ", Productivity Press (India) Pvt. Ltd. , 1992



Total Quality Management (MTPE-0302(B))

Course Code	Title of the Paper	Per	riods	Per w	reek	Distribution of Marks									
							The	ory		Tota	Р	ractic	al	Tot	Grand Total (j= e+i)
		L	Т	Р	C	Max (a)	Mi n (b)	MS T (c)	TW (d)	1 $(e=a+c+d)$	Max (f)	M in (g)	TW (h)	al (i= f+h)	
MTPE 0302B	Total Quality Management	3	1	-	4	70	22	20	10	100	-	-	-	-	100

UNIT- I

INTRODUCTION: Principles of Quality Management - Pioneers of TQM - Quality costs - Quality system Customer Orientation - Benchmarking - Re-engineering – Concurrent Engineering..

UNIT- II

PRACTICES OF TQM: Leadership - Organisational Structure - Team Building – Information Systems and Documentation - Quality Auditing - ISO 9000 - QS 9000

UNIT- III

TECHNIQUES OF TQM: Single Vendor Concept - J.I.T. - Quality Function deployment - Quality Circles - KAIZEN - SGA - POKA - YOKE - Taguchi Methods·

UNIT- IV

STATISTICAL QUALITY CONTROL: Methods and Philosophy of Statistical Process Control - Control Charts for Variables and Attributes - Cumulative sum and Exponentially weighted moving average control charts - Others SPC Techniques - Process Capability Analysis - Six sigma accuracy

UNIT- V

ACCEPTANCE SAMPLING: Acceptance Sampling Problem - Single Sampling Plans for attributes - double, multiple and sequential sampling, Military standards - The Dodge – Roming sampling plans.

Reference Books:

1. Mohamed Zairi, ff Total Quality Management for Engineers ff. Woodhead Publishing Limited 1991.

2. Harvid Noori and Russel, ff Production Lind operation management - Total Quality and Responsiveness ff, McGraw-Hill Inc, 1995.

3. Suresh Dalela and Saurabh, ISO 9000 ff A Manual for Total Quality Management S. .Chand and Company Ltd., 1997.

4. John Bank, ff The Essence of Total Quality Management ", Prentice Hall of 1f, Jia Pvt. Ltd. 1995.

5. Douglus C. Montgomery. ff Introduction to Statistical Quality C'ontrol ff, 2nd Edition, John Wiley and Sons. 1991



MTPE-0401 Dissertation Part- II

Course Code		Р	Periods Per week						tributio	Grand				
	Title of the Paper					The	Theory			Practical				Total
		L	Т	Р	C	Max (a)	Min (b)	MST (c)	Total (d= a+c)	Max (e)	Min (f)	TW (g)	Total (h= e+g)	(i= d+h)
MTPE- 0401	Dissertation Part- II			20	20					300		200	500	500
	Total			20	20					300		200	500	500