

**Dr. M.G.R EDUCATIONAL AND RESEARCH INSTITUTE
(Dr.M.G.R. DEEMED UNIVERSITY)**

M.E Applied Electronics

Eligibility: B.E (ECE, EEE, ICE, E & I, M.Sc (Electronics))

Curriculum

Semester – I

Subject code	Subject	L	T	P	C
MMA101	Applied Engineering Mathematics	3	1	---	4
MEC102	Digital Signal Processing	3	0	---	3
MEC103	Design and Analysis of IC's	3	0	---	3
MEC104	Communication Networks	3	0	---	3
MEC105	Advanced Digital System Design	3	0	---	3
MEC106	VLSI design	3	0	--	3
MEC107	Electronics Design Laboratory	---	---	3	2
Total					21

Semester – II

Subject code	Subject	L	T	P	C
MMG108	Advanced Management Principles	3	0	---	3
MEC109	VLSI Signal Processing	3	0	---	3
MEC110	Embedded System	3	0	---	3
MEC111	Digital Image Processing	3	0	---	3
MEC112	Advanced Digital Signal Processing	3	0	---	3
MEC1XX	Elective – I	3	0	--	3
MEC113	Term Paper	---	3	---	2
Total					20

Semester – III

Subject code	Subject	L	T	P	C
MEC201	Digital Control engineering	3	0	---	3
MEC202	Neural Networks and its applications	3	0	---	3
MEC2XX	Elective – II	3	0	---	3
MEC2XX	Elective – III	3	0	---	3
MEC203	Project Phase – I [Project Insisting on Paper Presentation in (International conference/National Conference)]			9	6
Total					18

Semester – IV

Subject code	Subject	L	T	P	C
MEC204	Project Work & Viva Voce	---	---	24	12

Total Credits: 71

L: Lecture

T: Tutorial

P: Practical

C: Credit

Electives

1. MECX50 Modern Digital Communication Techniques
2. MECX51 Computer Communication and ISDN
3. MECX52 Electromagnetic interference & Compatibility
4. MECX53 Multimedia Compression Techniques.
5. MECX54 Microcontroller based system Design
6. MECX55 Bio-medical Instrumentation
7. MECX56 Microwave Devices & Components
8. MECX57 Optical communication systems & Networks
9. MECX58 Soft Computing
10. MECX59 Digital Signal Processing Practice
11. MECX60 Computer Architecture and Parallel Processing

CALCULUS OF VARIATIONS:**9**

Maximum and Minimum of functions of several independent variables - Lagrangian method of multipliers. Variational problems of fixed boundaries only: Simplest variational problems - Euler equation - Brachistochrone problem - Variational problems involving several unknown functions - Functionals involving first and second order derivations - Functionals involving two or more independent variables - Isoperimetric problems.

LINEAR INTEGRAL EQUATIONS:**9**

Different types of integral equations - Fredholm and Volterra integral equations - Relation between differential and integral equations -Green's function - Fredholm equation with separable kernel - Iterative method for solving equation of second kind - properties of symmetric kernels.

VECTOR SPACE :**9**

Definition and examples of linear space - Linear dependence and independence – Bessie's and Dimension - Subspace - Inner product space - Orthogonalisation process. Bessie's inequality, Gram-Schmidt ortho normalization process

FUNCTIONS AND RELATIONS :**9**

Injective, surjective, bijective functions -Compositions, identity, inverse - relations - properties of relations. Graph Theory: Introduction - basic terminology - representation of graphs - connected graphs - matrix representation of graphs (excluding graphs). Applications - Critical path method - shortest path problems - trees - definition - Binary tree.

PROBABILITY THEORY & STOCHASTIC PROCESS**9**

Probability concepts, Moments – Two Dimensional Random Variables- Marginal and Conditional Distributions, Covariance, Random Process-Classification, Binominal Process, Auto correlation functions, linear System with Random inputs, Power spectral density, Cross spectral density Application linear systems with random inputs.

L : 45 Total : 45**REFERENCES:**

1. John.T. Scheick, Linear Algebra with Applications, The McGraw Hill Company 1997.
2. David.C. Lay linear Algebra and its Application second Edition, Wesly 1997
3. John G.Proakis, Marolakis D.G., "Digital signal Processing, Prentice Halls of India (P) Ltd., 1995.
4. Tremblay, J.P., and Manohar, R., "Discrete Mathematical Structures with Applications to Computer Science", McGraw Hill, 1987.
5. Peebles, Jr., 'Probability, Random variables and random signal principles', (1987), McGraw Hill Publishers
6. Narsingh Dev, "Graph Theory with Applications to Engineering and Computer Science", Prentice Hall of India (P) Ltd, 1984.
7. Boffey. T.B, Graph Theory in operation research, the Macmillan Press Ltd., 1982.
8. Elsgolts .L, Differential Equations and calculus of Variation, Mir Publishers 1973.

DISCRETE TIME LINEAR SYSTEMS:

12

Discrete linear systems - Time invariance - Causality, Stability, Difference Equations, Z-Transform and Inverse Z-Transform. Transfer function of linear discrete systems - Impulse response - Recursive, Non-Recursive filters - Digital filter realization - Direct, Canonic, Cascade, Parallel and Ladder realizations.

DESIGN OF DIGITAL FILTERS:

12

Review of design techniques for analog low pass filters - Frequency transformation - Properties of IIR filters - IIR filter design - Characteristics of FIR filters with linear phase - Frequency response of linear phase FIR filters - Design of FIR filters using Window functions.

Discrete Fourier Transform (DFT) - Definition - Properties - Convolution of sequences - Linear Convolution.

FFT ALGORITHMS:

12

Introduction to Radix-2 Fast Fourier Transform (FFT) - Properties- Decimation in Time FFT- Data shuffling and bit reversal - Decimation in Frequency FFT- Algorithms of Radix-2 FFT - Computing Inverse DFT by doing a direct DFT.

EFFECTS OF FINITE REGISTER LENGTH:

5

Effect of number representation on Quantization - Quantization in Sampling Analog signals - Finite Register - Length effects in realization of IIR digital filters - Finite register length effects in realization of FIR digital filters

POWER SPECTRUM ESTIMATION (Brief Ideas):

4

Basic principles of Estimation Theory - Estimation of Autocovariance - Periodiogram method of Power Spectral Estimation.

Total No. of Books : 45

TEXT BOOKS:

1. Oppenheim A.V., and Schaffer R.W., Buck .C, "Discrete-time Signal Processing", Prentice Hall India, 1999
2. Sanjit .K. Mitra, "Digital Signal Processing" - A computer Based Approach" - Tata McGraw Hill, 1997

REFERENCES:

1. Ludemann, L.C., "Fundamentals of Digital signal processing', John Wiley, Inc., 1992
2. Proakis J.B & Monalakis .J., "Digital Signal Processing" -Principles, Algorithm and Application Prentice Hall of India - 1998.

MEC103 DESIGN & ANALYSIS OF IC'S 3 0 0 3

HRS

1. CIRCUIT CONFIGURATION FOR LINEAR IC 13

Current Sources, analysis of difference amplifiers with active load, supply and temperature independent biasing technique voltage references.

2. OPERATIONAL AMPLIFIERS 10

Analysis of Operational amplifier circuits, slew rate model and high frequency analysis, operational amplifier noise analysis

3. ANALOG MULTIPLIER AND PLL 10

Analysis of four quadrant and variable transconductance multiplier, voltage controlled oscillator, closed loop analysis of PLL.

4. MOS ANALOG ICS 6

Design of MOS Operational Amplifier, MOS Power amplifier.

5. MOS SWITCHED CAPACITOR FILTERS 6

Design techniques for switched capacitor filter.

Total No. Of Periods: 45

Reference Books:

1. Behazad Razavi, "Principles of Data Conversion System Design", S.Chand & Company Ltd, 2000.
2. Grey and Meyar, "Analysis and Design of Analog Ics." Wiley International, 1996.
3. Kenneth R.Laker, Willy M.C.Sansen, William M.C.Sansen, "Design of Analog Integrated Circuits and Systems", McGraw Hill, 1994
4. Grey, Wolley, Brodersen, "Analog MOS Integrated Circuits", IEEE Press, 1989.

- 1. ADVANCED TOPICS IN BOOLEAN ALGEBRA** **9**
 Shannon’s expansion theorem, Consensus theorem, Octal designation, Runmeasure, INHIBIT/INCLUSION / AOI / Driver / Buffer gates, Gate expander, Reed Muller expansion, synthesis of multiple output combinational logic circuits by product map method, Design of static hazard free and dynamic hazard free logic circuits.
- 2. THRESHOLD LOGIC** **9**
 Linear separability, Unateness, Physical implementation, Dual comparability, Reduced functions, various theorems in threshold logic, Synthesis of single gate and multigate threshold Network.
- 3. SYMMETRIC FUNCTION** **9**
 Elementary symmetric functions, partially symmetric and totally symmetric function, Mc Cluskey decompositions method, Unity ratio symmetric ratio function, Synthesis of symmetric function by contact networks
- 4. SEQUENTIAL LOGIC CIRCUITS** **9**
 Mealy machine, Moore machine, Trivial / Reversible / Isomorphic sequential Machines, State diagrams, State table minimisation, incompletely specified sequential machines, State assignments, Design of synchronous and asynchronous sequential logic circuits working in the fundamental mode and pulse mode, Essential hazards Unger’s theorem.
- 5. PROGRAMMABLE LOGIC DEVICES** **9**
 Basic concepts, Programming technologies, Programmable logic Element (PLE), Programmable Logic Array (PLA), Programmable Array Logic (PAL), Structure of Standard PLD’s, Complex PLD’s (CPLD)

System Design Using PLD’s – Design of combinational and sequential circuits using PLD’s, Programming PAL device using PALASM, Design of state machine using Algorithms State Machine (ASM) chart as a design tool.

Total No. of Periods: 45

Reference Books:

1. William I. Fletcher, “AN Engineering Approach to Digital Design”, Prentice Hall of India, 1996.
2. James E.Palmer, David E.Perlman, Introduction to Digital Systems”, Tata McGraw Hill, 1996.
3. S.Devadas, A.Ghosh and K.Keutzer, “Logic Synthesis”, McGraw Hill, 1994.
4. N.N.Biswas, “Logic Design Theory”, Prentice Hall of India, 1993.

1. MOS Technology and Circuits**9**

Mos Technology and VLSI, Process parameters and considerations for BJT, MOS and CMOS, Electrical properties of MOS circuits and Device modeling-MOS Circuit Design Process -MOS Layers, Stick diagram Layout diagram Propagation delays, Examples of combinational logic design, Sealing of MOS circuits, Capacitance Calculations

2. Digital Circuits and Systems**9**

Programmable Logic Array (PLA) and Finite State Machines, Design of ALUs, Memories and Registers.

3. Analog VLSI and High Speed VLSI**9**

Introduction to Analog VLSI, Realisation of Neural Networks and Switched capacitor filters, sub-micron technology and GaAs VLSI technology.

4. Hardware Description Languages**9**

VHDL background and basic concepts, Structural specifications of hardware design organisation and parameterisation.

5. VLSI Design

VLSI applied to communication circuits, Filter design, VLSI for RF circuits, VLSI architectures for reduced critical path & low power design

Total No. of Periods = 45**References**

1. Wayne Wolf, Modern VLSI Design, 2nd Edition, Prentice Hall, 1998.
2. Douglas A. Pucknell and Kamran Eshraghian, Basic VLSI Design Systems and circuits, Prentice Hall of India Pvt Ltd., 1993.
3. Randall .L.Geiger and P.E.Allen, VLSI Design Techniques for Analog and Digital Circuits, McGraw Hill International Company, 1990
4. Amar Mukherjee, Introduction to NMOS and CMOS VLSI System Design, Prentice Hall, 1983.

L : 45**Total = 45****References**

- a. Douglas A. Pucknell and Kamran Eshraghian, Basic VLSI Design Systems and circuits, Prentice Hall of India Pvt Ltd., 1993.
- b. Wayne Wolf, Modern VLSI Design, 2nd Edition, Prentice Hall, 1998.
- c. Amar Mukherjee, Introduction to NMOS and CMOS VLSI System Design, Prentice Hall, 1983.
- d. Randall .L.Geiger and P.E.Allen, VLSI Design Techniques for Analog and Digital Circuits, McGraw Hill International Company, 1990

1. Schematic Capture and PCB layout design using EDA tools.
2. System Design using Micro controllers.
3. Microcontroller based timers, Stepper motor controller, LCD & CRT
Interfacing
4. System design using 16 bit Microprocessors.
5. SPICE simulation of electronic circuits.
6. Design of Power electronic circuits – SMPS, High Frequency DC/DC
Converters using Power MOSFET

Total No. Of Periods: 45.

1. CONTINOUS AND DISCRETE IMAGES AND SYSTEMS 9

Light, Luminance, Brightness and Contrast, Eye, The Monochrome Vision Model, Processing Problems and Applications, Vision Camera, Digital Processing System, 2-D sampling Theory, Aliasing, Image Quantization, Lloyd Max Quantizer, Dither, Color Images, Linear Systems And Shift Invariance, Fourier Transform, Z-Transform, Matrix theory Results, Block Matrices and Kronecker Products.

2. IMAGE TRANSFORMS 9

2-D orthogonal and Unitary transforms, 1-D and 2-d DFT, Cosine, Sine, Walsh, Hadamard, Haar, Slant, Karhunen-loeve, singular value Decomposition transforms.

3. IMAGE ENHANCEMENT 9

Point operations – Contrast stretching, clipping and thresholding density slicing, Histogram equalization, modification and specification, spatial operations – Spatial averaging, low pass, high pass, band pass filtering, direction smoothing, medium filtering, generalized cepstrum and homomorphic filtering, edge enhancement using 2-D IIR and FIR filters, color image enhancement

4. IMAGE RESTORATION 9

Image observation models, sources of degradation, inverse and Wiener filtering, geometric mean filter, non-linear filters. Smoothing splines and interpolation, constrained least squares restoration.

5. IMAGEDATA COMPRESSION AND IMAE RECONSTRUCTION FROM PROJECTION 9

Image data rates, pixels coding, predictive techniques transform coding and vector DPCM, Block truncation coding, wavelet transform coding of images, color image coding. Random transform.

Total Number of Periods : 45

Reference Books :

1. Anil K. Jain, “Fundamentals of Digital Image Processing”, PHI 1995.
2. M.A.Sid Ahmed, “Image Processing”, McGraw Hill, Inc, 1995.
3. R.Gonzalazand P.Wintz, “Digital Image Processing”, Addition Wesley 2nd Ed, 1987.
4. William. K.Pratt, “Digital Image Processing ”,Wiley Interscience, 2nd Ed, 1991.

- 1. PRINCIPLES OF CONTROLLERS** **9**
- Review of frequency and time response analysis and specifications of control systems, need for controllers, continuous time compensations, continuous time PI, PD, PID controllers, digital PID controllers.
- 2. SIGNAL PROCESSING IN DIGITAL CONTROL** **9**
- Sampling, time and frequency domain description, aliasing, hold operation, mathematical model of sample and hold, zero and first order hold, factors limiting the choice of sampling rate, reconstruction.
- 3. MODELLING AND ANALYSIS OF SAMPLED DATA CONTROL LANGUAGE** **9**
- Difference equation description, Z-transform method of description, pulse transfer function, time and frequency response of discrete time control systems, stability of digital control systems, Jury's stability test, state variable concepts, first companion, second companion, Jordan canonical models, discrete state variable models, elementary principles.
- 4. DESIGN OF DIGITAL CONTROL ALGORITHMS** **9**
- Review of principle of compensator design Z-plane specification, digital compensator design using frequency response plots, discrete integrator, discrete differentiator, development of digital PID controller, transfer function, design in the Z – Plane
- 5. PRACTICAL ASPECTS OF DIGITAL CONTROL ALGORITHMS** **9**
- Algorithm development of PID control algorithms, software implementation, implementation using microprocessors and microcontrollers, finite word length effects, choice of data acquisition systems, microcontroller based temperature control systems, microcontroller based motor speed control systems.

Total No. Of Periods: 45

Text Book:

1. M.Gopal, "Digital control and static variable Methods", Tata McGraw Hill, New Delhi, 1997.

Reference Books:

1. John J.D' Azzo, "Constantine Houprios, Linear Control System Analysis nad Design", McGraw Hill, 1995.
2. Kenneth J. Ayala, "The 8051 Microcontroller – Architecture, Programming and Application", Penram International, 2nd Edition, 1996.

INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS 9

Neuro – physiology – General Processing Element – ADALINE – LMS learning rule –
MADALINE – perception Networks

1. BPN AND BAM 9

Back Propagation Network – Updating of output and hidden layer weights –
Application of BPN – Associative memory – Bi-directional Associative Memory -
Hop field memory – Traveling sales man problem

2. SIMULATED ANNEALING AND CPN 9

Annealing, Boltzmann machine – Learning – Application – Counter Propagation
network – Architecture – Training – Application.

3. SOM AND ART 9

Self-organizing map – Learning algorithm – Feature map classifier – Applications –
Architecture of Adaptive Resonance theory – Pattern matching in ART network.
Neocognitron: Architecture of Neocognitron – Data processing and performance of
architecture of Spacio – Temporal networks for speech recognition

4. CASE STUDY:

1. Implementation of BPN algorithm in a computer language
2. Application of Neural Networks for Pattern recognition, data comparison
3. Hop field networks for an nbit A/D converter

Total No. of Periods : 45

Reference Books:

1. J.A. Freeman and B.M. Skapura, “Neural Networks, Algorithms Applications and Programming Techniques”, Addison-Wesley, 1990.
2. Laurence Fausett, “Fundamentals of Neural Networks: Architecture, Algorithms and Applications”, Prentice Hall, 1994.

1. Functional architecture coded and encoded digital communication system architecture
9
2. **Digital Modulation** 9
PSD, Data pulse stream, M-ary Markov source, convolutionally coded modulation, continuous phase
3. **Coherent and Non-coherent communication waveform** 9
Optical receiver in WGN, MF receiver, Matrix generation, colored GN, Whitening approach, inphase and Quadrature phase moderm.
4. **Band Limited Channels** 9
Optimum pulse shape design, Optimum demodulations of digital signals in the presence of ISI
5. **Coded Digital Communication** 9
Architecture, interfacing, detailing, Synchronization, block coded digital communication system, performance, type of binary block codes, Shannon channel coding theorem, linear block codes.

Total No of periods : 45

Reference Books :

1. Simon Haykin, Digital Communications, John Wiley and sons, 1998.
2. Wayne Tomasi, Advanced Electronic communication system, 4th Edition, Pearson Education Asia, 1998
3. B.P.Lathi, modern Digital and analog communication systems, 3rd Edition, Oxford University Press, 1998.
4. M.K.Simon, S.M.Hindedi and W.C.Lindsey, Digital Communicaiton techniques : signalling and detection, Prentice Hall India, New Delhi. 1995.

MECX51 COMPUTER COMMUNICATION AND ISDN 3 0 0 3 HRS

UNIT – I COMPUTER COMMUNICATION 9

Evolution of data Networks, Network architecture, ISO Reference model example of networks, Application of networks.

UNIT – II MEDIUM ACCESS SYBLAYER & DATA LINK LAYER 9

Local area networks, conventional channel allocation methods, pure – ALOHA, S-ALOHA, finite population ALOHA , Controlled ALOHA, Reservation ALOHA, Design issues for packet radio networks- IEEE standards for LAN – Ethernet.

UNIT – III NETWORK AND TRANSPORT LAYER 9

Network layer design issues – Routing algorithms- Congestion control algorithms – Internet working. Transport layer design issues – connection management

UNIT – IV QUEING THEORY AND CAPACITY ASSIGNMENT 9

M/M/I Queues, M/G/I – Priority queuing capacity assignment for terminal network and distributed networks – concentration and buffering for finite and infinite buffers

UNIT – V PRESENTATION LAYER & APPLICATION LAYER 9

Design issues – Abstract syntax notation – Data compression techniques – Cryptography – Remote procedure call. Design issues – file transfer access and managements.

Total No. of Periods : 45

Reference Books:

1. Andrew S.Tanenbaum, Computer Networks – Prentice Hall of India 1990.
2. D.Bertsekas and R.Gallagherv, Data Networks – Prentice hall of India, 1989.
3. Fred Halsall, Data Communication, Computer Networks and open system – Addition Welsey 2000.
4. Gerd E.Keiser, Load Area Networks – McGraw ill Publication, 1989.

MECX52 ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY IN SYSTEM DESIGN 3 0 0 3 HRS

- 1. EMI ENVIRONMENT 9**

Sources of EMI, conducted and radiated EMI, Transient EMI, EMI-EMC definitions and units of parameters. Emi Coupling Principles Conducted, Radiated and Transient Coupling, Common impedance Ground Coupling, Radiated Common Mode and Ground Loop coupling, Radiated Differential Mode Coupling, Near Field Cable to cable coupling, Power mains and Power supply Coupling.
- 2. EMI SPECIFICATION / STANDARDS / LIMITS 9**

Units of specification, Civilian standards Military standards.
- 3. EMI MEASUREMENTS 9**

EMI Test Instruments ? Systems., EMI Test, EMI shielded Chamber, Open Area Test Site, TEM Cell Antennas, Conductors Sensors / Injectors / Couplers,. Military Test Method and Procedures, Calibration Procedures.
- 4. EMICONTROL TECHINQUES 9**

Shielding, Filtering, Grounding, Bonding, Isolation Transformer, Transient Suppressors, Cable Routing, Signal Control, Component Selection and Mounting.
- 5. EMI DESIGN OF PCBs 9**

PCB Traces Cross Talk, Impedance Control, Power Distribution Decoupling, Zoning Motherboard Design and Propagation Delay Performance Models.

Total Number of Periods : 45.

Reference Books:

- a. Bernhard Keiser.” Principles of Electromagnetic compatibility”, Artech House, #rd Ed, 1986.
- b. Henry W.Ott, “Noise Reduction Techniques in Electronic Systems”, John Wiley and Sons, New York, 1988.
- c. V.P.Kodali, “Engineering EMC Principles, Measurements and Technologies”, IEEE Press, 1996.

3. LIU Y and GIBSON G.A Microcomputer System ; the 8086 / 8088 family : Architecture, Programming and Design – Prentice hall of India Pvt Ltd M.D, 1979.

MECX55	<u>BIOMEDICAL INSTRUMENTATION</u>	3	0	0	3
					HRS
	<u>UNIT – I</u>				9
	Basic physiology-study of cells & their structures-Nervous system				
	<u>UNIT – II</u>				9
	Basic Transducer principles & Electrodes – Bio-Chemical transducers				
	<u>UNIT – III</u>				9
	Cardiovascular system- ECG- blood pressure measurement				
	<u>UNIT – IV</u>				9
	X-ray & Radioisotope Instrumentation – Fluoroscopy-Image intensifiers				
	<u>UNIT – V</u>				9
	Bio-telemetry – Anatomy of Nervous system – EEG-EMG				

Total No. of periods : 45

Reference Books:

1. M.ARUMUGAM, Bio-medical Instruemntation-Anuradha Agencies Publishers, 1992.
2. LESIS CROMWELL FRED, J.WERBELL and ERICH A.PFRAFFER, Bio-medical Instruemntation and measurements- Prentice Hall of India, 1990.
3. KHANDPUR, Handbook on Bio-medical Instrumentation-Tata McGraw Hill Co Ltd., 1989.

1. Hoffman R.K “Handbook of microwave intergrated circuits”, Artech House, Bostonm, 1987.
2. Gupta. K.C and Amarjit Singh, “Microwave Intergrated circuits” John Wiley, New York, 1975.

MECX57 OPTICAL COMMUNICATION SYSTEMS AND NETWORKS

3 0 0 3

HRS

1. FIBRE OPTIC GUIDES 9

Light wave generation systems, systems components, optical fibers, SI, GI fibre, modes, Dispersion in fibers, Limitations due to dispersions, fibre loss, non liner effects

2. OPTICAL TRANSMITTERS AND FIBRES 9

Basic concepts, LED structures spectral distribution, semiconductor lasers, gain coefficients, modes, SLM and STM operation, Transmitter design, Receiver PIN and APD diodes design, noise sensitivity degradation,

3. LIGHT WAVE SYSTEM 9

Coherent, homodyne and Hetro dyne keying formats, BER in synchronous and Asynchronous.

4. AMPLIFIERS 9

Basic concepts, Semiconductor laser amplifiers Raman-and Brillouin-fibre amplifiers, Erbium doped-fibre and amplifiers, pumping phenomenon

5. DISPERSION COMPENSATION 9

Limitations, post-and pre-compensation techniques, equalizing filters

Total No. of periods : 45

Reference Books:

1. Franze & Jain, Optical communication, systems and components, Narosa Publication, new Delhi, 2000
2. G. Keiser, Optical fibre communication, system, McGraw Hill, New York, 2000
3. G.P. Agarwal, Fibre optic communication system. 2nd Edition, John Wiley & Sons, New York, 1997.
4. Franz and Jain, Optical communication system, Narosa Publications, New Delhi, 1995

MECX58 SOFT COMPUTING 3 0 0 3

HRS

1) ARTIFICIAL NEURALS	9
Basic-concepts- single layer perception- Multi layer perception – Supervised and unsupervised learning back propagation networks, Application	
2) FUZZY SYSTEMS	9
Fuzzy sets and Fuzzy reasoning – Fuzzy matrices – Fuzzy functions-decompositions	
3) NEURO-FUZZY MODELLING	9
Adaptive networks based Fuzzy interfaces – Classification and Representation trees- Data distemp algorithm	
4) GENETIC ALGORITHM	9
Survival of the fittest- Pictures computations-cross over mutation-reproduction-rank method-rank space method, application	
5) SOFT COMPUTING AND CONVENTIONAL AI	9
AI Search algorithm-Predicate calculus rules of interface- Semantic networks-frames- objects- Hybrid models-applications	

Total No. of periods : 45

Reference Books :

1. Jang J.S.R., Sun C.T and Mizutami E-Neuro Fuzzy and Soft computing Prentice Hall New Jersey, 1998.
2. Nih.J.Ndssen Artificial intelligence, Harcourt Asia Ltd., Singapore, 1998.
3. Timothy J.Ross : Fuzzy Logic Engineering Applications McGraw Hill, NewYork, 1997
4. Laurance Fauseett : Fundamentals of Neural networks, prentice Hall India, New Hersey, 1995.

MECX59 DIGITAL SIGNAL PROCESSING PRACTICE.

- b)** Study of TMS320C3X Processors
- c)** Implementation of Linear Convolution
- d)** Implementation of circular convolution
- e)** Implementation of DFT & IDFT
- f)** Compression of Analog Signal
- g)** Interfacing with I/O deices through CODEC chip, etc.

1. THEORY OF PARALLELISM
15

Parallel computer models – The state of computing, multiprocessors and multicomputers and Multivectors and SIMD computer, PRAM and VLSI models, and Architectural development tracks. Program and networks properties, Conditions of parallelism, Program partitioning architecture. Principles of scalable performance – Performance matrices and measures, parallel processing applications, speedup performance laws, scalability analysis and approaches.

2. HARDWARE TECHNOLOGIES
10

Processor and memory hierarchy advanced processor technology, super scalar and vector processor, memory hierarchy technology, virtual memory technology, bus cache and shared memory – back plane bus systems, cache memory organisations, shared memory organisations, sequential and weak consistency models.

3. PIPELINING AND SUPERSCLAR TECHNOLOGIES
10

Parallel and scalable architectures, Multiprocessor and Mutlicomputers, Multivector and SIMD computer, scalable, Multithreaded and data flow architectures.

4. SOFTWARE AND PARALLEL PROGRAMMING
10

Parallel models, Languages and compilers, Parallel program development and environments,
UNIX, MACH and OSF / 1 for parallel computers.

Total No. of Periods: 45

Reference Books:

1. M.J.Quinn, “Designing Efficient Algorithms for Parallel Computers”, McGraw Hill International, 1994.
2. Kai Hwang, “Advanced Computer Architecture”, McGraw Hill International, 1993.
3. William Stallings, “Computer Organization and Architecture”, Macmillan Publishing company, 1990.

