

SCHEME OF EXAMINATION

for

(From Aug'2007 to June'2012)

MASTER OF TECHNOLOGY [Electronics and Communication Engineering] WEEKEND PROGRAMME

Offered by



INDIRA GANDHI INSTITUTE OF TECHNOLOGY

(A Constituent college of GGSIP University)

Kashmere Gate Delhi-110006

www.ipu.ac.in

Admission Criteria & Eligibility

Admission Criteria:

Admission will be based on the merit list of the candidates in the qualifying examination.

Entry Level : 60% or equivalent in the qualifying examination.

Eligibility/ Qualifications:

Group-A

1. B.Tech. / B.E. in Electronics & Communication / Electronics Engineering / Electrical & Electronics or Equivalent
2. M. Sc. in Electronics or equivalent/ M.Sc (Physics) with Specialization in Electronics
3. Grad. I E T E / AMIE (ECE)

Group-B*

1. B.Tech./ B.E. in Computer Science & Engineering / Computer Engineering or equivalent
2. B.Tech./ B.E. in Electrical / Instrumentation & Control

Experience:

In addition to above qualification(s), candidates should also have at least one year of professional/teaching experience after completing the qualifying examination as on 30th June.

Merit List:

Merit List will be prepared on the following basis:

- i) Percentage of Qualifying degree
- ii) **One** Mark per additional year of experience up to maximum of **five**.

***If the seats from Group A are not filled, then candidates from Group B may be considered**

M. Tech
[Electronics and Communication Engineering]
Weekend Programme

First Semester

Code No.	Paper	Credits	Contact Hrs./ Semester
ECW- 601	Digital System Design	3	40
ECW- 603	Detection and Estimation Theory	3	40
ECW- 605	Modern Digital communication Systems	3	40
Practicals			
ECW- 651	Digital System Design Lab	2	30
ECW- 653	Modern Digital Communication System Lab	2	30
ECW- 655	Term Paper -1 & Expert Lecture*	3	-
	TOTAL	16	

* Non University Exam System

M. Tech
[Electronics and Communication Engineering]
Weekend Programme

Second Semester

Code No.	Paper	Credits	Contact Hrs./ Semester
ECW – 602	Microelectronics Technology	3	40
ECW – 604	Advanced Digital signal processing	3	40
ECW – 606	Optical Fiber Communication systems and Networks	3	40
Practicals			
ECW – 652	Advanced Digital signal processing Lab	2	30
ECW – 654	Optical Fiber Communication systems and Networks Lab	2	30
ECW – 656	Term Paper-II & Expert Lecture	3	-
	TOTAL	16	

*** Non University Exam System**

M. Tech
[Electronics and Communication Engineering]
Weekend Programme

Third Semester

Code No.	Paper	Credits	Contact Hrs./ Semester
ECW – 701	Advanced VLSI Design	3	40
ECW – 703	Digital Mobile Cellular Systems	3	40
ECW – 705	Digital Image processing	3	40
Practicals			
ECW – 751	Advanced VLSI Design Lab	2	30
ECW – 753	Digital Mobile Cellular Systems Lab	2	30
ECW – 755	Digital Image processing Lab	2	30
ECW – 757	Term Paper – III & Expert Lecture*	3	-
	TOTAL	18	

* Non University Exam System

M. Tech
[Electronics and Communication Engineering]
Weekend Programme

Fourth Semester

Code No.	Paper	Credits	Contact Hrs./ Semester
ECW – 702	Industrial Systems	3	40
ECW – 704	Microwave Integrated Circuits	3	40
Elective I (choose any one)		3	40
ECW – 706	Speech processing		
ECW – 708	Advanced Radiation Systems		
ECW – 710	Embedded Systems and design		
ECW – 712	Radar and Satellite Communication technology		
ECW - 714	Advanced mobile Computing		
ECW- 716	Knowledge Management		
Practicals			
ECW – 752	Elective-I	2	30
ECW – 754	Microwave Integrated Circuits Lab	2	30
ECW – 756	Minor Project	4	-
TOTAL		17	

***Non University Exam System**

M. Tech
[Electronics and Communication Engineering]
Weekend Programme

Fifth Semester

Code No.	Paper	Credits	Contact Hrs./ Semester
ECW– 801	Enterprise Resource Planning (ERP) and beyond	3	40
Elective II (choose any one)		3	40
ECW– 803	Quantam computing and Nanotechnology		
ECW– 805	MEMS and Sensor Technology		
ECW– 807	Multimedia Technology		
ECW– 809	Smart Antennas systems		
ECW- 811	Open ended topic		
Elective III (choose any one)			
ECW– 817	Network Security		
ECW– 819	Advanced Computer Communication Networks		
ECW– 821	Virtual Instrumentation		
ECW– 823	Soft Computing		
ECW- 825	Artificial Intelligence and expert systems		
ECW-827	Open ended research topic		
Practicals			
ITW – 851	Elective-II Lab	2	30
ITW – 853	Elective-III Lab	2	30
ITW – 855	Major Project Part-I	4	-
	TOTAL	17	

***Non University Exam System**

Applicable to batch upto admitted in Aug 2011

M. Tech
[Electronics and Communication Engineering]
Weekend Programme

Sixth Semester

Code No.	Paper	Credits	Contact Semester	Hrs./
ECW – 802	Major Project Part-II/ Dissertation	16	-	
ECW –804*	Seminar & Progress Reports	03	-	
ECW– 806*	Comprehensive Viva	03	-	
	Total	22		

***Non University Exam System**

Note:

1. The total number of credits of the programme M. Tech [Information Technology] = 106
2. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of 100 credits.

Note: Elective course(s) will be offered only if it is opted by 33% of actual strength of the class.

M. Tech. (Electronics & Communications Engg.)
SYLLABUS (Ist Semester)

Subject: Digital System Design

Paper Code: ECW-601

Total Hrs: 40

Unit-I

Digital System Design Using HDL

10 Hrs

Basic concepts of Hardware Description Languages, Verilog, VHDL, Modelling digital system using Verilog, VHDL. Design and implementation using HDLs, case study.

Unit-II

Programmable Logic Devices

10 Hrs

Introduction to Programmable logic, programmable technologies, JTAG, standardized file formats for programming PLDs FPGAs, Structure of standard PLD, FPGA. Field programmable gate arrays (FPGA), Xilinx FPGA, Actel FPGA,

Unit-III

ASICs

10 Hrs

Introduction to ASICs, library design, logic cells, I/O cells, interconnects. Design software, design entry, logic synthesis, Simulation test. ASIC Construction, floor-planning and placement, Routing.

Unit-IV

Timing Issues In Digital Circuits

10 Hrs

Classification, clock distribution, synchronizers and arbiters. Self timed circuits, clock synthesis, synchronization using PLL. Distributive clocking using DLL. Optical clock distribution.

Recommended Books :

1. Digital integrated circuits-A design perspective by Jan M. Rabaey, Anantha Chandrakasan and Borivoje Nikolic, Pearson education, 2nd edition
2. The Designers's guide to VHDL by Peter J Ashenden, 2nd ed, Elsevier
3. Design through verilog by T.R. Padmanabhan and B. Bala Tripura Sundari, IEEE Press

Applicable to batch upto admitted in Aug 2011

4. Application Specific Integrated Circuits by Michael John S. Smith, Addison-wesley

M. Tech. (Electronics & Communications Engg.)
SYLLABUS (Ist Semester)

Subject : Detection & Estimation Theory

Paper code: ECW-603

Total Hr: 40

Unit-I

Review of Random Process

10 Hrs

Review of Probability Theory, Basic concepts of random processes, random variables, basic concepts from systems theory and stochastic processes, Stationary and non stationary process, correlation function, Ergodicity and power spectral density, transformation random process by linear system, Special random process : white Gaussian noise ,Wiener levy, Shot noise, Markov Process

Unit-II

Hypothesis Testing

10 Hrs

Simple binary hypothesis test, Decesion Criteria, Neyman Pearson tests, Bayes Criteria
Multiple hypothesis testing, Composite hypothesis testing

Unit-III

Detection Theory

10 Hrs

Sequential detection Walds test Detection of known signals in white noise, Detection of known signal in colored noise, Maximum SNR Criteria, Detection of signals with unknown parameters

Unit-IV

Estimation Theory

10 Hrs

Bayes Estimation, Real parameter estimation, Maximum likelihood estimation, Cramer Rao Inequality, lower bound on the minimum mean square error in estimating a random parameter, Multiple parameter estimation, types of estimation and errors bounds ,General Gaussian problem, EM algorithm, Wiener-Hopf and Kalman filtering. Applications to communication, radar and sonar systems.

Recommended Books :

1. Helstrom, C. W., Elements of Signal Detection and Estimation, Prentice Hall, NJ, 1995
2. H. L. Van Trees, Detection, Estimation, and Modulation Theory, Wiley, 1971
3. H. V. Poor, An introduction to signal detection and estimation 2nd ed, New York : Springer-Verlag

Applicable to batch upto admitted in Aug 2011

4. M.D. Srinath, R.K. Rajasekaran, and R. Viswanathan, Introduction to Statistical Signal processing with Applications
5. R. M. Gray and L. D. Davisson, An Introduction to Statistical Signal Processing, Cambridge Univ.

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (Ist Semester)

Subject: Modern Digital Communication Systems

Total Hrs 40

Paper Code: ECW-605

Unit-1

10 Hrs

Base band data transmission. Nyquist criterion for zero ISI. Correlative level coding. Data detection. Optimum design of transmit and receive filters. Equalization. Linear, adaptive, fractionally spaced and decision feedback equalizers.

Unit-2

10 Hrs

Digital base band modulation schemes. Carrier synchronization methods. Symbol timing estimation methods. Various types of Digital carrier modulation Schemes

Unit-3

12 Hrs

Linear block codes, cyclic codes; encoding and decoding. Non-binary codes. Convolutional codes. Decoding of convolutional codes. Trellis coded modulation. Lattice type trellis codes. Turbo coding. Interleaver, turbo encoder, MAP decoder, Log MAP decoder. Performance measures.

Unit-4

8 Hrs

D S and F H spread spectrum. CDMA system based on FH spread spectrum signals. Synchronization of spread spectrum signals.

Recommended Books :

1. J.G.Proakis, Digital Communication (4/e), McGraw- Hill, 2001
2. S.Lin & D.J.Costello, Error Control Coding (2/e) Pearson, 2005
3. Simon Haykins, Digital Communication systems, Wiley Publishers

Applicable to batch upto admitted in Aug 2011

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (IInd Semester)

Subject: Microelectronics Technology

Paper Code: ECW-602

Total Hrs: 40

Unit-I

IC Fabrication

15 Hrs

Silicon crystal growth and wafer preparation. Electronic grade silicon, theory of crystal growing, Czochralski technique. Testing, measurements of parameters of crystals and its characteristics. Shaping operations, cleaning and processing considerations. Crystal growth for device applications-epitaxial growth, lattice matching. Oxidation, Doping techniques: diffusion, ion implantation. Deposited thin films: polysilicon, silicon dioxide, silicon nitride, metals, silicides. Metallization and contacts, Lithography: optical, electron beam, X-ray. Etching techniques: wet chemical, dry plasma.

Unit-II

Yield and Reliability

05 Hrs

Defects and Contamination. IC failure modes, soft errors, Testing, functionality tests, manufacturing tests, Wire bonding, Flip-chip techniques, Reliability evaluation. Packaging-types and considerations

Unit-III

MOS Fabrication Process

10 Hrs

NMOS, PMOS process, control of threshold voltage, Silicon gate technology, isolation and wells. Self aligned MOSFET structure. Short channel MOS structures, DMOS, VMOS. Twin well CMOS process,. Monolithic resistors and capacitors. Silicon On Insulator(SOI)

Unit-IV

Bipolar IC Technology

10 Hrs

NPN, PNP fabrication, power transistors, P-N junction isolation, dielectric isolation. Isoplanar and other IC structures, Punch through transistors, Schottky barrier transistors, superbeta transistors. Integrated diodes, Resistors and capacitors. BiCMOS fabrication in an n-well process, Introduction to GaAs technology, doping process, energy band structure, fabrication.

Applicable to batch upto admitted in Aug 2011

Books:

1. VLSI Fabrication Principles by S.K. Ghandhi, John wiley
2. VLSI Technology editor S.M. Sze, Tata. MH

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (IInd Semester)

Subject : Advanced Signal Processing

Paper code: ECW-604

Total Hr : 40

Unit-I

Review of Basic DSP

10 Hrs

Discrete Fourier Transform, linear filtering method based on the DFT, FFT at various radices.
Digital filter design

Multirate Digital Signal

10 Hrs

Decimation, Interpolation Sampling rate conversion by rational factor, Filter design for sampling rate conversion, multistage implementation of sampling rate conversion, sampling rate conversion by an arbitrary factor.

Unit-II

Linear Prediction and Optimum Linear Filters

10 Hrs

Representation of a stationary random process, Forward and Backward linear prediction, solution of normal equations (levinson-durbin), lattice structure, wiener filter for filtering and prediction.

Unit-III

System Modeling and Identification

10 Hrs

System modeling and identification (MA, AR, ARMA), least square filter design for prediction, matrix formulation for least square estimation: SVD, LDU decomposition, Gram-Schmidt orthogonalization, QR decomposition

Unit-IV

Adaptive Filtering

10 Hrs

Least square method –delay line structure, Least Mean Squares(LMS) and Recursive Least square(RLS) algorithms and their convergence performance, Kalman filter Adaptive Direct –Form FIR filters And application of adaptive filters

Applicable to batch upto admitted in Aug 2011

Books :

1. Proakis, Rader, Ling, Nikias, “Advanced Digital Signal Processing”, Macmillan Publishing House
2. Alexander “Adaptive Signal Processing Theory and Applications” Springer Verlag
3. Widrow, Stearns “Adaptive Signal Processing”, Pearson Education
4. Vaseghi “Advanced Digital Signal Processing and Noise Reduction”, Wiley

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (IInd Semester)

Subject: Optical Fiber Communication Systems & Networks

Paper Code: ECW- 606

Total Hrs: 40

Unit-1

10 Hrs

The evolution of Fiber Optics Systems. Quantum Nature of Light, Optical Laws. Optical Fiber modes and configuration. SI, GI Fibers. Dispersion in Fibers. Fiber Loss. Signal Distortion in Optical Fibers.

Unit-II

12 Hrs

LED structures. Spectral Distribution. Semi-Conductor Laser Diodes. Source to Fiber Launching. Lensing Schemes for Coupling improvement. Fiber to Fiber joints. Fiber Splicing. Optical Fiber connectors. Photodetectors. PIN Photodetector, Avalanche Photodetector. Optical Receiver operation.

Unit-III

08 Hrs

Optical Amplifiers. Semi Conductors Optical Amplifiers, Erbium-Doped Fiber Amplifiers. Amplifier Noise. Wavelength Division Multiplexing(WDM). Phased array based WDM Devices.

Unit-IV

10 Hrs

Optical Networks. SONET/SDH Networks. Wavelength- Routed Networks Performance of WDM & EDFA Systems. Soliton Optical Transmission. Optical CDMA. Ultra-HighCapacity Networks.

Books:

- 1) Gerd Keiser, Optical Fiber Communication, MC Graw Hill International Edition.
- 2) Djafar K.Mynbaev & Lowell L.Scheiner, Fiber-Optic Communication Technology, Pearson Education Asia.

Applicable to batch upto admitted in Aug 2011

3) John M. Senior, Optical Fiber Communication, Prentice Hall India.

M. Tech. (Electronics & Communications Engg.)
SYLLABUS (IIIrd Semester)

Subject: Advanced VLSI Design

Total Hrs: 40

Paper Code: ECW-701

Unit-I

Semiconductors, junctions and MOSFET overview

10 Hrs

Two terminal MOS structure, flat band condition, three terminal MOS structure, body effect, pinchoff voltage, four terminal MOS structure, general charge sheet models
MOS transistors with ion implanted channels

Unit-II

Small Dimension Effects

10 Hrs

Channel length modulation, barrier lowering, two dimensional charge sharing, short channel devices, narrow channel devices, punch through, hot carrier effects, scaling, surface and drain resistances, effects due to thin oxides and high doping.

Unit-III

Large and Small signal Modelling

10 Hrs

MOS Transistor dynamic operation, evaluation of charges in quasi static operation, transit time under DC conditions, limitations of quasi static model, non-quasi static model, low frequency medium frequency and high frequency small signal models, MOSFET modeling for RF applications

Unit-IV

MOSFET Modelling for circuit Simulation

10 Hrs

Applicable to batch upto admitted in Aug 2011

Types of models, combining several effects into one physical model, parameter extraction, accuracy, properties of good models, considerations and choices, benchmark tests, non technical considerations.

Recommended Books :

1. Operation and modeling of The MOS transistor by Yannis Tsividis, Second Edition, McGraw Hill international editions
2. S.M. Sze, Physics of semiconductor devices, John Wiley
3. P. Richman, Characteristics and operation of MOS Field Effect Devices, McGraw Hill.

M. Tech. (Electronics & Communications Engg.) **SYLLABUS (IIIrd Semester)**

Subject: Digital Mobile Cellular Systems

Paper Code: ECW- 703

Total Hrs: 40

Unit-I

10 Hrs

Overview & Classification of Mobile Communication Systems. Mobile Communication Channel. Modelling of Propagation Loss. Diversity reception. Cellular System Concepts. Ways of increasing system capacity. First Generation Cellular Telephony.

Unit-II

10 Hrs

GSM Cellular Telephony. GSM Architecture. Radio Transmission Parameters of GSM. GSM Logical Channels. GSM Burst Structures. Call setup Procedures & Handover in GSM System. Data Transmission in GSM. HSCSD, GPRS, EDGE.

Unit-III

10 Hrs

CDMA in Mobile Communication Systems. Spreading Sequences. Basic Transmitter & Receiver Schemes in CDMA Systems. RAKE Receiver. Multi Carrier CDMA. IS- 95 System. Digital Cordless Telephony .Wire Less Local Loops.

Unit-IV

10 Hrs

Third Generation Mobile Communication Systems. IMT 2000. Concepts of UMTS. UTRA FDD Mode, UTRA TDD Mode.WCDMA. CDMA 2000. Application of Smart Antennas in Cellular

Applicable to batch upto admitted in Aug 2011

Telephony. Satellite Mobile Communication Systems. Iridium, Global Star, ICO Systems.

Recommended Books :

- 1) Hazysztof Wesolowski, Mobile Communication Systems, Wiley.
- 2) Theodore S. Rappaport, Wireless Communications Principles & Practice, Pearson Education
- 3) Jochen Schiller, Mobile Communications, Pearson Education.
- 4) Raj Pandya, Mobile & Personal Communication Systems And Service, PHI.

M. Tech. (Electronics & Communications Engg.) **SYLLABUS (IIIrd Semester)**

Subject: Digital Image Processing

Paper Code: ECW - 705

Total Hrs: 40

Unit-I

Introduction and Digital Image Fundamentals

10 Hrs

Fundamentals Steps in Image Processing, Elements of Digital Image Processing Systems, Image Sampling and Quantization, Basic relationships like Neighbors, Connectivity, Distance Measures between pixels, Linear and Non Linear Operations. Introduction to 2D Fourier Transform and Linear Algebra

Unit-II

Image Enhancement in the Spatial Domain and Frequency Domain (10 Hrs)

Basic Gray Level Transformations, Histogram Processing, Enhancement Using Arithmetic and Logic operations, Spatial Filters, Smoothing and Sharpening Combining Spatial Enhancement Methods and the frequency Domain, Smoothing and Sharpening Frequency Domain Filters, Homomorphic Filtering.

Unit-III

Image Restoration and Compression

10 Hrs

Image Degradation / Restoration Model, Noise Models, Restoration in the presence of Noise using Spatial Filtering and Frequency Domain Filtering, Estimation of Degradation Function, Inverse filtering, Wiener filtering, Constrained Least Square Filtering, Geometric Mean Filter, Geometric Transformations.

Applicable to batch upto admitted in Aug 2011

Image Compression models, Analysis of various frequency domain transformations for Image compression. Elements of Information Theory, Lossy and Lossless Compression, Image compression standards.

Unit-IV

Image Segmentation and Description

10 Hrs

Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region Oriented Segmentation, Motion based segmentation.

Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Introduction to Morphology, Various Morphological Algorithms, Patterns and Pattern Classes, Decision-Theoretic Methods, Structural Methods.

Recommended Books :

1. Rafael C. Gonzalez & Richard E. Woods, “Digital Image Processing”, 2nd edition, Pearson Education.
2. A. K. Jain, “Fundamental of Digital Image Processing”, PHI.

Reference Books:

1. Rosefield Kak, “Digital Picture Processing”
2. W. K. Pratt, “Digital Image Processing”

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (IVth Semester)

SUBJECT: Industrial Engineering and Systems

Total Hrs 40

Paper Code : ECW-702

Industrial Engineering.: Definition and Evolution, Understanding Industrial System Focus: Production/Service System. Performance measures of a Production System -Production, Productivity, Efficiency, Effectiveness, Quality, Flexibility, Agility etc.

Classical Industrial Engineering -Work Study: Method Study and Time Study, Human Factors, Ergonomics, Motivation Recent and Emerging Applications of IE –Role of IT in Systems– MIS, FMS etc.; Japanese Influences: Just in Time (JIT), Kanban etc.

Increasing Integration in Industrial Enterprises: From MRP to ERP to Supply Chain Management; Career Opportunities in Industrial Engineering.- Career Options, Types of Jobs and Employers, Entrepreneurship .Industrial Engineering Tool Kit.-Technical skills: IE problem Solving and OR. ;Human skills– Teamwork, Communication skills.; IT skills

Applicable to batch upto admitted in Aug 2011

Decision Support System (DSS), Intelligent Systems. Engineering Managers, System and Process (ERP) Specialists, Change Managers.

M. Tech. (Electronics & Communications Engg.)
SYLLABUS (IVth Semester)

Subject: Microwave Integrated Circuits

Paper Code ECW-704

Total Hrs: 40

Unit I

Introduction of strip Lines

10 Hrs

Review of development and application of the modern transmission line structure as interconnect and as a medium for realization of components for the MIC and MMIC: quasi – static and frequency dependent medium closed form models of microstrip line for effective relative permittivity, capacitance ,characteristic impedance analysis and dielectric and conductor losses: Effect of conductor thickness, top shield and side walls on the propagation characteristics of a microstrip line.

Unit II

Microstrip Passive Components

10 Hrs

Circuit models of discontinuities in microstrip lines and the coplanar waveguide, open ended, short ,gaps, step, bent, T- junction, Hybrid line coupler, parallel coupled line and directional couplers, filters .

Unit III

Microwave Amplifier Design

10 Hrs

Applicable to batch upto admitted in Aug 2011

Microwave transistors, Stability considerations, Power-gain definitions, Simultaneous conjugate matching, Consideration for unilateral design.

Unit IV

Microwave Oscillator Design

10 Hrs

Negative Resistance Oscillators, Transistor Oscillators .
(10 Hours)

Textbook

Bharathi Bhat & Shibani K.Koul, "Stripline – like Transmission Lines for Microwave Integrated Circuits," John Wiley.

Suggested Books

E.H Fooks & R.A. Zakarevicuis, "Microwave Engineering using Microstrip Circuits." Prentice Hall.

T.C.Edwards, "Foundation for Microstrip Circuit Design," John Wiley & sons.

M.Samuel, Y.Lieo, "Microwave Circuit Analysis and Amplifier Design," Prentice Hall .

SYLLABUS

M.TECH (Electronics & Communication)

Subject: Speech Processing

Paper Code: ECW - 706

Total Hrs: 40

Unit -I

INTRODUCTION

3hrs

Digital speech processing, acquaintance with various fields of study like parameter extraction, front end processing of speech, analysis of speech, digital transmission and storage of speech, speech synthesis systems, speaker verification and identification systems, speech coding, speech recognition and enhancement of speech quality.

Unit -II

DIGITAL MODELS FOR THE SPEECH SIGNAL

10hrs

- a) The mechanism of speech production in human body
- b) Physiology of speech organs(the lungs, larynx, vocal folds ,vocal tract)
- c) Articulatory phonetics
- d) Acoustic phonetics
- e) Digital model of speech signal

Applicable to batch upto admitted in Aug 2011

Unit -III

SHORT TIME SPEECH ANALYSIS

14hrs

a) Time domain parameters:

Short time energy and average magnitude, short time average zero crossing rate, pitch period estimation, short time autocorrelation function

b) Frequency domain parameters:

Filter bank analysis, short time spectrum analysis – linear
Filtering interpretation, Fourier transform interpretation

c) Linear predictive coding analysis:

Least square autocorrelation method, least square covariance method

d) Cepstral analysis

Unit –IV

13hrs

DIGITAL REPRESENTATION OF SPEECH AND SPEECH CODING

Sampling, Quantization, Companding, Linear Predictive Coding – fundamental aspect of Various LPC coders, CELP, ACELP. Application of Speech Processing in Speech and Speaker Recognition System

Books:

1. Digital Processing of Speech Signals by L. R. Rabiner & R. W. Schaffer.
2. Speech Communication, Human and Machine by Douglas O'Shaughnessy.

SYLLABUS

M.TECH (Electronics & Communication)

Subject: Advanced Radiation system

Paper Code ECW-708

Total Hours(40)

Unit I

Theory of electromagnetic radiation: Coordinate system and transformation of field quantities in different coordinate system. Basic parameters and definition: Radiation pattern, Radiation intensity, Radiation power density, Directive gain, side lobe, back lobe, polarization, bandwidth, beam efficiency, Input Impedance.

(10 hours)

Unit II

Antennas with applications: Formulation of radiation integral of wire, loop and helix antenna. Theory of aperture antenna including the Fourier Transform method, horn antenna, linear array: Applicable to batch upto admitted in Aug 2011

Two element and multi elements array, isotropic and non –isotropic array.
(10 hours)

Unit III

Design consideration of Antennas :Parabolic reflector antenna, Micro strip antenna Rectangular and circular patch. Feed network of micro strip antenna array
(10 hours)

Unit IV

Antenna for mobile communication: hands set antenna and base station antenna.Computer – aided design and analysis of wire antennas, feed network and antenna arrays using antenna CAD software.
(10 hours)

Textbook

A.Balanis,”Antenna Theory: Analysis and Design,” Wiley

Suggested Texts:

Kraus and Marhefke,”Antennas: For all applications,” McGraw Hill.
Stutzman and Thiele,” Antenna Theory and Design,” Wiley.

SYLLABUS

M.TECH (Electronics & Communication)

Subject: Embedded Systems Designs

Paper Code: ECW - 710

Total Hrs: 40

Unit-I

Introduction to an embedded systems design:

Introduction to Embedded system, Embedded System Project Management, ESD and Codesign issues in System development Process, Design cycle in the development phase for an embedded system, Use of target system or its emulator and In-circuit emulator, Use of software tools for development of an ES.

Unit-II

Processes and Operating Systems:

Applicable to batch upto admitted in Aug 2011

The Processes abstraction, Switching contexts between programs, Real-time operating systems, Intercrosses communication, Performance analysis and power consumption.

Unit-III

Microcontroller:

Role of processor selection in Embedded System (Microprocessor V/s Micro-controller), 8051 Microcontroller: Architecture, basic assembly language programming concepts, Instruction set, Addressing Modes, Logical Operation, Arithmetic Operations, Subroutine, Interrupt handling, Timing subroutines, Serial data transmission, Serial data Communication

Unit-IV

Networks for Embedded Systems

The I²C Bus, The CAN bus, SHARC link Ports, Ethernet, Myrinet, Internet, Introduction to Bluetooth: Specification, Core Protocol, Cable replacement protocol. IEEE 1149.1 (JTAG) Testability: Boundary Scan Architecture

Text Books:

1. Embedded Systems by Raj Kamal, TMH
2. The 8051 Microcontroller by K.J. Ayala, Penram International
3. J B Peatman, Design with PIC Microcontrollers, Prentice Hall

References:

1. An Embedded Software Primer by David E. Simon, Pearson Education
2. Designing Embedded Hardware by John Catsoulis, O'reilly
3. Embedded System Design by Frank Vahid, Tony Givargis," , John Wiley & Sons, Inc
4. Building Embedded Linux Systems by Karim Yaghmour, O'reilly

SYLLABUS

M.TECH (Electronics & Communication)

Subject: Radar & Satellite Communication Technology

Paper Code: ECW-712

Total Hrs: 40

Unit-I

Introduction to satellite communications

10 Hrs

Historical background, communication networks and services, comparison of network transmission technologies. Orbits and perturbations, geostationary orbit, limits of visibility. Launching methods and propulsion. Atmospheric losses, ionospheric effects and other propagation impairments. Polarization and antennas.

Applicable to batch upto admitted in Aug 2011

Unit-II

Spacecraft and earth station

10 Hrs

Power supply, attitude control, station keeping, TT&C subsystem, transponders. Earth station equipments, tracking systems. Modulation, coding and multiplexing. Satellite access, FDMA, CDMA, TDMA, Demand assignment multiple access. Satellite services and the internet, VSATs, GPS, Direct broadcast satellite services, DTH

Unit-III

Link design

10 Hrs

Equivalent Isotropic Radiated Power, transmission losses, system noise, carrier to noise ration, uplink, downlink, effects of rain combined uplink and downlink C/N ratio, Intermodulation noise, interference, energy dispersal.

Unit-IV

RADAR

10 Hrs

RADAR range equation, pulsed radar system, Modulators, radar displays, target detection, scanning and tracking, Doppler effect, CW radar, MTI(Moving target indicator radar, Radio navigational aids, Loop antenna, Adcock antenna, Phased array radars.

Books

1. Satellite communications, 3rd Ed by Dennis Roddy, McGraw-Hill international edition
2. Satellite communication systems engineering 2nd Ed, by Wilbur L Pritchard, Henri G Suyderhoud and Robert A Nelson, Pearson education
3. RADAR system by Scolnik.

SYLLABUS

M.TECH (Electronics & Communication)

Subject: Advanced Mobile Computing

Paper Code: ECW- 714

Total Hrs: 40

Unit-1

10 Hrs

Introduction to Personal Communication Systems. PCS Architecture. Medium Access Techniques GSM Overview. Packet Switched Data. 2.5/3G Mobile Wireless Systems. GPRS, EDGE Systems. WCDMA & CDMA 2000 Systems.

Unit-II

10 Hrs

Applicable to batch upto admitted in Aug 2011

Wireless Local Area Networks. IEEE 802.11, System Architecture and Protocol Architecture of IEEE 802.11. HIPERLAN Architecture, Bluetooth Networks , Mobile Internet Protocol. IP Packet Delivery. Tunneling and Encapsulation. Reverse Tunneling. IPv6.

Unit-III

10 Hrs

Wireless Application Protocol. Networks for WAP. WAP Layered Architecture and Protocol Stack. WAP Gateways. Wireless Markup Language(WML). Programming in WML. WML Script. Voice over Internet Protocol and Convergence Technologies. 10

Unit-IV

10 Hrs

Wireless Local Loop Technologies. WLL Architecture Model. Mobile AD HOC Networks. AD HOC Routing Protocols. DSDV, DSR and AODV Routing Techniques. Quality of service in Mobile Ad hoc Networks.

Books :

- 1) Yi-Bing and Imrich Chlamtac, "Wireless and Mobile Networks Architectures", John Wiley & Sons, 2001.
- 2) Raj Pandya, Mobile & Personal Communication Systems And Service, PHI.
- 3) Asoke k Talukder , Roopa R Yavagal, Mobile Computing , Technology, Application and Service Creation. Tata Mc Graw Hill.
- 4) Jon W. Mark , Weihua Zhuang, " Wireless Communication and Networking", PHI.
- 5) Jochen Schiller, Mobile Communication, Pearson Education.

SYLLABUS

M.TECH (ELECTRONICS AND COMMUNICATION)

SUBJECT: Knowledge Management

Total hr 40

Paper Code: ECW-716

Introduction, definitions, industrial motivation, Evolving Industrial Competition(multi attributed competition), flexibility, integration and automation in enterprises, growing need for Knowledge

Applicable to batch upto admitted in Aug 2011

and its effective Management (KM), role of IT, KM and challenges of CIMS, intelligent manufacturing, ERP, SCM and CRM, E-manufacturing etc.

KM technical concepts: (data vs information vs knowledge), The Knowledge Edge, Knowledge Engineering, KM Framework (process steps), Aligning KM with Manufacturing Strategy, Business Strategy etc., design and deployment of KM in industrial enterprises (KM team, KM system analysis, Developing Effective Systems, Knowledge Audit), IT based tools, role of performance measurement, KM and competitive link, intelligent manufacturing, agile enterprises, cases, presentations, group exercises. Role of Simulation and Intelligent Systems, KM Deployment, Managing Innovation, Performance Measurement, Applications.

M. Tech. (Electronics & Communications Engg.)
SYLLABUS (Vth Semester)

Subject: ENTERPRISE RESOURCE PLANNING

Paper Code: ECW-801

Total Hrs: 40

Applicable to batch upto admitted in Aug 2011

Unit-I

ERP as Integrated Management Information System, Evolution of ERP, Benefits of ERP. ERP vs Traditional Information Systems. Business Process Reengineering- need and challenges, Management concerns about BPR. BPR to build business Model for ERP.

Unit-II

ERP & Competitive advantage, Basic Constituents of ERP, Selection criteria for ERP Packages. procurement process for ERP Package Overview of ERP packages – PEOPLE SOFT, SAP-R/3, BAAN IV, MFG/PRO, IFS/AVALON, ORACLE-FINANCIAL, Survey of Indian ERP Packages regarding their Coverage, performance & cost.

Unit-III

ERP Implementation- issues, Role of Consultants, Vendors, Users, Need for training, customization. ERP implementation methodology and post implementation issues and options. Basics of Supply Chain Management – Order Management, Logistics. SCM basic principles, tasks and competencies , interfaces and complexities

Unit-IV

Types of SCM, potential benefits of SCM, possible obstacles, Application systems supporting SCM – engineering, Product Data Management, Sales, Procurement, Production, MRP, Distribution. ERP Case Studies in HRM, FINANCE, PRODUCTION, PRODUCT DATABASE, MATERIALS, SALES & DISTRIBUTION

Recommended Books :

1. Enterprise Resource Planning – Concepts and Practices by Vinod Kumar Garg & N K Venkatakrisna, PHI
2. Enterprise Resource Planning by S Sadagopan – PHI
3. Enterprise Resource Planning – Alexis Leon Tata McGraw Hill, 1/e, 2003

SYLLABUS

M.TECH(ELECTRONICS AND COMMUNICATION)

Subject : Quantum Computing and Nano Technology

Code No : ECW-803

Total Hrs: 40

Introduction

Introduction to nanoscale systems, Length energy and time scales, Top down approach to Nano lithography, Spatial resolution of optical, deep ultraviolet, X-ray, electron beam and ion beam lithography, Single electron transistors, coulomb blockade effects in ultra small metallic tunnel junctions

Quantum Mechanics

Quantum confinement of electrons in semiconductor nano structures, Two dimensional confinement (Quantum wells), Band gap engineering, Epitaxy, Landauer – Buttiker formalism for conduction in confined geometries, One dimensional confinement, Quantum point contacts, quantum dots and Bottom up approach, Introduction to quantum methods for information processing.

Molecular Techniques

Molecular Electronics, Chemical self assembly, carbon nano tubes, Self assembled mono layers, Electromechanical techniques, Applications in biological and chemical detection, Atomic scale characterization techniques, scanning tunneling microscopy, atomic force microscopy

Text:

1. Beenaker and Van Houten “Quantum Transport in Semiconductor Nanostructures in Solid state Physics” Ehernreich and Turnbell, Academic press, 1991

References:

1. David Ferry “Transport in Nano structures” Cambridge University press 2000
2. Y. Imry “Introduction to Mesoscopic Physics, Oxford University press 1997
3. S. Dutta “Electron Transport in Mesoscopic systems” Cambridge University press 1995
4. H. Grabert and M. Devoret “Single charge Tunneling” Plenum press 1992

SYLLABUS

M.TECH (Electronics & Communication)

Applicable to batch upto admitted in Aug 2011

Subject: MEMS and Sensor Technology

Paper Code: ECW-805

Total Hrs: 40

Unit-I

Micromachining Technologies & Applications **10 Hr**

MEMS Introduction, Characteristics of MEMS; Typical Application Areas of MEMS , Examples of MEMS, Applications in automotive industry, Applications in biomedical industry, Scaling Laws & Microsciences, Microscaling considerations MEMS materials, Silicon, Polymers, Metals. MEMS processes, Deposition processes, Photolithography , Etching processes _Wet etching Reactive ion etching (RIE) Deep reactive ion etching (DRIE). Bulk Micromachining: Etching Characteristics and Device Examples. Surface Micromachining: Process Design and Device Examples Bonding & Packaging of MEMS

Unit-II

MEMS Process integration **10 Hr**

System Integration Technologies, Micro Fluidic systems ,Monolithic Micro Systems Hybrid Micro Systems, Hybrid Macro-Micro Systems .Integration of Precision Engineering & Micromachining Technologies, Overview of Advanced Micro Systems Fabrication Technologies Plastics Technologies, Glass Technologies ,Metals Technologies

Unit-III

Electronics for MEMS **10 Hr**

Microactuation Mechanisms Electrostatic Actuation, Piezoelectric, etc. Microsensing Capacitive Sensing, Resistive, etc. Mechanical Properties of MEMS Materials Electromechanical Interface, MEMS Simulators. Interface circuits such as A/D converter and pre-amplifiers , Electronic circuit as composition basis of the sensing system (analog circuit, filter circuit, arithmetic circuit). The Future of MEMS

Unit-IV

Sensors **10 Hr**

Principles of various sensors and applications using the sensors, chemical sensors: gas/vapor phase, liquid phase Field sensor: temperature, pressure, strain, flow measurement. Physical quantity sensor: force, speed, sound, ultrasonic wave. Physics and chemical sensor: optical sensor, infrared analysis, gas chromatography, smell, taste, bio.

Books

1. Microsystem Design, Senturia, Kluwer, 2001, ISBN 0-7923-7246-8
2. S.M. Sze (ed.), Semiconductor Sensors, John Wiley and Sons, Inc., NY, 1994. The *Foundations of MEMS* by Dr. Chang Liu, Prentice Hall and authored
3. "An Introduction to Microelectromechanical Systems Engineering," by Nadim Maluf, Artech House, 2000.
4. Julian W. Gardner, Microsensors – Principles and Applications, John Wiley and Sons, Inc., NY, 1994

Applicable to batch upto admitted in Aug 2011

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (Vth Semester)

Subject: Multimedia Technology (Elective)

Paper Code: ECW-807

Total Hrs: 40

Unit –I

Introduction:

Concept of Multimedia, Multimedia Applications, Hardware Software requirements, Multimedia products & its evaluation.

Unit –II

Components of multimedia: Text, Graphics, Audio, Video.

Design & Authoring Tools, Categories of Authority Tools, Types of products.

Unit –III

Animation:

Introduction, Basic Terminology techniques, Motion Graphics 2D & 3D animation.

Unit –IV

Introduction to MAYA (Animating Tool):

Fundamentals, Modeling: NURBS, Polygon, Organic, animation, paths & boxes, deformers.

Working with MEL: Basics & Programming

Rendering & Special Effects: Shading & Texturing Surfaces, Lighting, Special effects.

BOOKS:

1. David Hillman, "Multimedia Technology & Applications", Galgotia Publications.
2. Rajneesh Agrawal, "Multimedia Systems", Excel Books.
3. Nigel Chapman & Jenny Chapman, "Digital Multimedia", Wiley Publications.
4. D. P. Mukherjee, "Fundamentals of Computer Graphics and Multimedia", PHI.

SYLLABUS

M.TECH (Electronics & Communication)

Subject: Smart Antenna Systems

Paper Code: ECW- 809

Total Hrs: 40

Unit-1

08 Hrs

Signal processing for wireless systems. Adaptive antennas. Beam forming Networks. Digital radio receiver techniques and software radios.

Unit-II

10 Hrs

Coherent and non-Coherent CDMA special processors. Dynamic re-sectoring. Range and Capacity extension- Multi cell systems. Spatio-temporal channel models.

Unit-III

10 Hrs

Environment and Signal parameters. Geometrically based single bounce elliptical model. Optimal spatial filtering- adaptive algorithms for CDMA. Multitarget decision –directed algorithm.

Unit-IV

12 Hrs

DOA Estimation- Conventional Subspace methods. ML estimation techniques. Estimation of the number of sources using eigen decomposition. Direction finding and true ranging PL systems. Elliptic and hyperbolic PL systems. TDOA estimation techniques.

Books:

1. T.S.Rappaport & J.C.Liberti, Smart antennas for wireless Communication, Printice Hall,1999
2. R.Janaswamy, Radiowave propagation and Smart antennas for wireless communication, Kluwer,2001

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (Vth Semester)

Subject: Advanced Analog Signal Processing (Elective)

Paper Code: ECW-811

Total Hrs: 40

Unit I

Review of Active Elements and Their Applications **10 Hrs**

Introduction to active elements, primary and secondary building blocks, operational amplifier (op-amp), operational transconductance amplifier (OTA), immittance converters and inverters, generalized immittance converter, pathological elements (Nullator, Norator and Nullor) and their use in realizing controlled sources and other active elements, active network synthesis.

Unit II

Translinear Bipolar and MOS Circuits **10 Hrs**

BJT Translinear principle, MOS Translinear principle, various Translinear circuits, Squarer/ divider, square rooting, vector magnitude circuit, multipliers, Translinear current amplifiers etc.

Unit III

Voltage Mode Signal Processing **10 Hrs**

Continuous Time Signal Processing, OTA-C filters, Current Conveyers and their applications, Current feedback op-amp and its applications.

Unit IV

Current Mode Signal Processing **10 Hrs**

Current Mode Signal Processing, Current Mode compared to voltage-mode, mixed mode signal processing, mixed mode signal processing using OTAs, mixed mode signal processing using current conveyors.

Suggested Texts

1. C. Toumazou, F.J. Lidgley and D.G.Haigh, 'Analog IC design: the current mode approach, Peter Peregrinus Ltd. on behalf of IEE, 1993.
2. Edwin W. Greneich, 'Analog Integrated Circuits, International Thomson Publishing, 1997.
3. R. Schauman, M. S. Ghausi and K. R. Laker, 'Design of Analog Filters: Passive, Active RC and Switched Capacitors, Prentice- Hall, Englewood Cliffs, 1990.

Applicable to batch upto admitted in Aug 2011

M. Tech. (Electronics & Communications Engg.)
SYLLABUS (Vth Semester)

SUBJECT: Network Management and Security

Total hr.40

Paper Code: ECW 817

UNIT-I

Introduction

Classical security Techniques and Computer Network Security Concepts. Confidentiality and Security, Security Policy and Operations Life Cycle, Security System Development and Operations The Attack Process. Attacker Types. Vulnerability Types. Attack Results. Attack Taxonomy. Threats to Security: Physical security, Biometric systems, monitoring controls, and Data security and intrusion and detection systems.

UNIT-II

Encryption Techniques

Conventional techniques, Modern techniques, DES, DES chaining, Triple DES, RSA algorithm, Key management. Message Authentication and Hash Algorithm, Authentication requirements and functions secure Hash Algorithm, Message digest algorithm, digital signatures. AES Algorithms.

UNIT-III

Designing Secure Networks

Components of a Hardening Strategy. Network Devices. Host Operating Systems. Applications. Appliance-Based Network Services. Rogue Device Detection, Network Security Technologies The Difficulties of Secure Networking. Security Technologies. Emerging Security Technologies General Design Considerations, Layer 2 Security Considerations. IP Addressing Design Considerations. ICMP Design Considerations. Routing Considerations. Transport Protocol Design Considerations

UNIT-IV

Network Security Platform Options IPsec VPN Design

Network Security Platform Options. Network Security Device Best Practices, Common Application Design Considerations. E-Mail. DNS. HTTP/HTTPS. FTP. Instant Messaging. Organizational Realities. Protocol Capabilities. Tool Capabilities. Secure Management Design Options. Network Security Management, Firewalls, Trusted systems, IT act and cyber laws. VPN Basics. Types of IPsec VPNs. IPsec Modes of Operation and Security Options. Topology Considerations. Design Considerations. Site-to-Site Deployment Examples.

Applicable to batch upto admitted in Aug 2011

Secure Network Management and Network Security Management

Text:

1. Sean Convery, “ Network Security Architectures, Published by Cisco Press, First Ed. 2004
2. William Stalling “Cryptography and Network Security” Pearson Education

SYLLABUS

M.TECH (Electronics & Communication)

Subject: ADVANCED COMPUTER COMMUNICATION NETWORK

Paper Code ECW-819

Total Hours(40)

Unit I

LAN NETWORKING AND DATA TRANSMISSION PROTOCOL :

IP, IPX, Apple-Talk, Ethernet, FDDI , token ring, wireless 802.11(b), 802.11(g), 802.16.

(05 hours)

WAN DIGITAL TRANSMISSION TECHNOLOGIES:

T-Carrier, SONET, SDH/PDH, Frame Relay, Isdn, Global Cellular.

(05 hours)

Unit II

Design AND IMPLEMENTATION OF ENTERPRISE NETWORK:

Router And Switches, Router Configuration Multi protocol, Network Traffic, Routing In PDN and Internet Environments, Network Performance Management And Trouble Shooting Concepts Including SNMP.

(10 hours)

Unit III

CELLULAR MOBILE COMPUTER COMMUNICATION:

GSM TECHNOLOGY, NA-TDM, PCN, VOIP AND FOIP, SMS, CISCO'S IGRP/EIGRP, ACL, NAT, TUNNELING AND IOS BASICS.

(10 hours)

Unit IV

SATELITE AND BROADBAND ISDN NETWORK

ISDN Channels, Access Interfaces, Functional Devices And References, Overview Of Isdn Services, Protocol Structure, D-Channel Layer 3 Protocols, Networking And Addressing , Isdn Products.

Broadband Networks-Need, Fast Packet Switching, Frame Relay, Cell Relay, and ATM, FDDI LMDS, SMDS, AIN.

Frame Relay- Basic Definition, Protocol Architecture, Permanent And Switched VC, Frame Relays Standard, Multicast Services.

ATM- ATM Standards, Terms And Concepts, B-ISDN, Protocol Architecture, Physical Layer, ATM Layer, AAL, ATM Services, ATM Switches.

SMDS-Overview, SMDS Interfaces And Services.

ISDN, B-ISDN and INTERNET Protocol.

(10 hours)

Textbook

Applicable to batch upto admitted in Aug 2011

M.James Martin “ Understanding The Network”- Techmedia Publications

Suggested Texts:

4. Kessler And Southelck”Isdn”- Mc Graw Hill, 3e 1996.
5. William Stalling “Isdn”- Pearson Education
6. William Stalling”Data And Computer Communication”-Pearson Education.

M. Tech. (Electronics & Communications Engg.)

SYLLABUS (Vth Semester)

Subject: Virtual Instrumentation and Real Time Systems

Paper Code: ECW-821

Total Hrs: 40

OBJECTIVE

This course gives an extensive information and application of virtual instrumentation for all types of measurement systems and analysis.

Unit I

Review of virtual instrumentation

10 Hrs

Historical perspective and traditional bench-top instruments - General functional description of a digital instrument- Block diagram of a Virtual Instrument – Physical quantities and analog interfaces- Hardware and Software – User Interfaces –Advantages of Virtual Instruments over conventional instruments – Architecture of a Virtual Instruments and its relation to the operating system.

Unit II

Data Flow Techniques

10 Hrs

LabVIEW – graphical user interfaces- controls and Indicators – ‘G’ programming –data types –data flow programming –Editing Debugging and Running a Virtual Instrument –Graphical programming palettes and tools – Front panel objects – Function and Libraries

Unit III

Applicable to batch upto admitted in Aug 2011

Programming techniques and data acquisitions basics **10 Hrs**

FOR Loops, WHILE loops, Shift Registers, CASE structure, formula nodes-Sequence structures- Arrays and Clusters- Array operations – Bundle, Unbundle – Bundle/Unbundle by name, graphs and charts – string and file I/O – High level and Low level file I/Os – attribute nodes local and global variables.

Basics of DAQ Hardware and Software – Concepts of Data Acquisition and terminology – Installing Hardware, Installing drivers -Configuring the Hardware – addressing the hardware in LabVIEW- Digital and Analog I/O function – Buffered I/O – Real time Data Acquisition

Unit IV

Applications of VI and VI applications in various fields **10 Hrs**

Simple programs in VI- Advanced concepts in LabVIEW- TCP/IP VI's, Synchronization – other elements of Virtual Instrumentation – Bus extensions – PXI - Computer based instruments - Image acquisition –Motion Control.

Textbook

1. Garry M. Johnson, “LabVIEW Graphical Programming”, Tata McGraw-Hill, Edition, 1996
2. Lisa.K.Wills, “LabVIEW for Everyone” Prentice Hall of India, 1996.

Suggested Texts

7. Lisa K Wells And Jeffrey Travis “Lab View For Every One “-Prentice Hall -1997.
8. Sokolof-“Basic Concept Of Lab View-4”, Prentice Hall -1998.
9. S. Gupta And J P Gupta “Data Acquisition And Process Control” Instrument Society Of America, 1994.
10. Labview Basics I And Ii Manual, National Instruments, 2003
11. Barry Paton, “Sensor, Transducers And Lab View”, Prentice Hall, 2000

Applicable to batch upto admitted in Aug 2011

SYLLABUS

M.TECH(ELECTRONICS AND COMMUNICATION)

Subject: Soft Computing

Total hr 40

Paper Code: ECW-823

UNIT I

Basic mathematics, Brief idea of biological neuron, artificial neurons, comparison of measurement of activation functions in real and artificial neurons, study of various neuron signal functions, McCulloch-Pitts neuron model, Feedforward networks: architecture and determination of activation functions, Feedback neural networks,

UNIT II

Learning and adaptation, STM, LTM, habituation, sensitization, supervised and unsupervised learning, learning algorithms, supervised learning, unsupervised learning, Hebbian learning, Perceptron learning, Delta learning, Gradient descent rules, perceptron learning algorithm, linearly non-separable data, LMS learning, steepest descent search, back propagation, BP learning algorithm, training data set, number of training cycles, initialization of weights, proper learning rate and their adjustment. Need of hidden layers, multilayer feed forward neural networks

UNIT III

Introduction to fuzzy logic, fuzzy sets, linguistic variables, fuzzy rules, inference, defuzzification, Operations on fuzzy sets, properties of fuzzy sets, fuzzy relations, fuzzy graphs and fuzzy arithmetic, fuzzy if-then rules.

UNIT IV

Basics of Genetic algorithms, designing a genetic algorithm, improving the convergence rule, A case study of GA

Reference books:

- 1. Introduction to Artificial Neural SystemsJacek M. Zurada**

Applicable to batch upto admitted in Aug 2011

2. **Introduction to Neural networks.....Alison Carling**
3. **Nero-Computers-Optimized based learning...K.K. Shukla**
4. **Neural network fundamentals with graphs.....Bose and Liang**
5. **Fuzzy Logic..... Harrington**

SYLLABUS
M.TECH(ELECTRONICS AND COMMUNICATION)

Subject: Artificial Intelligence and Experts Systems

Total hr 40

Paper Code: ECW-825

Introduction:

Introduction to intelligent agents

Problem solving:

Solving problems by searching : state space formulation, depth first and breadth first search, iterative deepening

Intelligent search methods:

A* and its memory restricted variants

Production systems:

Design implementation and limitations, case studies

Game Playing:

Minimax, alpha-beta pruning

Knowledge and reasoning:

Propositional and first order logic, semantic networks, building a knowledge base, inference in first order logic, logical reasoning systems

Planning:

STRIPS partial order planning, uncertain knowledge and reasoning, probabilistic reasoning systems, Bayesian networks

Learning from observations:

Applicable to batch upto admitted in Aug 2011

Inductive learning, learning decision trees, computational learning theory, Explanation based learning

Applications:

Environmental Science, Robotics, Aerospace, Medical Science etc.

Text Books:

1. "AI, a modern approach" by Russel and Norvig, Pearson Education
2. "AI" by Rich and Knight, Tata McGraw Hill
3. "Neural Networks in Computer Intelligence" by KM Fu, McGraw Hill