JK Lakshmipat University

Near Mahindra SEZ, Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500/504

INSTITUTE OF ENGINEERING AND TECHNOLOGY

2 Year M. Tech Program

(Branch: Electronics & Communication Engineering)

Batch 2012-14

Course Structure, Detailed Syllabus

&

Scheme of Examination

Institute of Engineering and Technology
Department of Electronics & Communication Engineering
Course Structure for the Batch 2012-14
(M.Tech Electronics & Communication Engineering)

Semester	Courses								(L T P) Credits / Hrs/ Week
I	Advance Communication Systems	Digital Signal Processing	Nanotechnology	Advanced Communication Systems Lab					(8 2 2) 12
	MTEC101 (3 1 0) 4	MTEC102 (3 1 0) 4	MTEC103 (2 0 0) 2	MTEC151 (0 0 2) 2					12
II	Digital Signal Processing Lab	Elective I	Fiber optic communication	Wireless And Mobile Communication	VLSI Technology	Elective II	Optical Communication Lab	Seminar	(15 5 8) 26
	MTEC152 (0 0 2) 2	(3 1 0) 4	MTEC201 (3 1 0)4	MTEC202 (3 1 2) 4	MTEC203 (3 1 2) 4	(3 1 0) 4	MTEC251 (0 0 2) 2	MTSEM201 2	28
III	Advanced Professional Communication	Dissertation Stage – I	Elective-III	Elective-IV	Professional Practice				(9 3 2) 22
	MTLA201 (1 1 2) 2	MTDS3018	(3 1 0) 4	(3 1 0) 4	MTPP301 (2 0 0)4				14
IV	Dissertation Stage – II								(0 0 0) 20
	MTDS40120								-

List of Elective Courses

Elective I	Telecom Network Management (MTEC123)		Transmission Line and EM Waves (MTEC122)	Digital Electronics and Computer Organization MTEL101				
Elective II	**Advanced Power Electronics (MTEC221)**	MEMS (MTEC222)	Multimedia Systems (MTEC223)					
Elective III	Coding Theory and Practice (MTEC321)	Computer Communication Network and Internet (MTEC324)	RF CIRCUITS & SYSTEMS (MTEC325)	Digital Image Processing MTEC322				
Elective IV	Antenna Theory & Techniques (MTEC421)							

Total Credits 75

JK Lakshmipat University

Near Mahindra SEZ, Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500/504

INSTITUTE OF ENGINEERING AND TECHNOLOGY

2 Year M. Tech Program

(Branch: Electronics & Communication Engineering)

Batch 2012-14

SEMESTER-ONE

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC101	Advance Communication Systems	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100				

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Communication Process, Elements of Communication Systems, Communication Channels. Need for modulation, Basic forms of Amplitude Modulation & Demodulation, AM, DSB, SSB-SC.
- Fundamentals of FM, PM and it's essential features, FM Generation and Demodulation.
- ASK, FSK, PSK Techniques, and Probability of error. Basic Principles, PAM, PWM, PPM, Basics of PCM, Delta Modulation, ADM & DPCM. Sampling Theorem, FDM & TDM.
- Information, Entropy, Channel Capacity, Shannon's Theorem, Shannon Hartley Theorem, Bandwidth - S/N Trade Off. Introduction to source coding, Coding Efficiency, Shannon-Fano Coding and Hoffman Coding.
- Random Variables, Mean, correlation, Covariance Functions, and PSD. Introduction to the effect of noise on AM & FM systems.

Text Books:

1. Simon Haykins,*Communication Systems*, John Wiley & Sons, Inc., 4th edition, 2001

Reference Books:

1. Proakis J. G. and Salehi M., *Communication Systems Engineering*, Pearson Education, 2002.T
2. Taub H. and Schilling D.L., *Principles of Communication Systems*, Tata McGraw Hill, 2001.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC102	Digital Signal Processing	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100				

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

REVIEW OF DISCRETE SIGNAL REPRESENTATION AND ANALYSIS
TIME AND FREQUENCY-DOMAIN DESIGN TECHNIQUES FOR IIR AND FIR FILTERS
FIR And IIR Filter Specifications And Structure, FIR Filter Design- Window Method, Park- s Method, Frequency Sampling Method; Design Of IIR Digital Filters: Butterworth, Chebyshev And Elliptic Approximations. Low Pass, Band Pass, Band Stop And High Pass Filters, Bilinear Transformation Method, Adaptive Signal Processing
EFFECT OF FINITE REGISTERS LENGTH

Number Representation, Quantization Error, Round-Off Error, Overflow Error, Limit Cycle, System Noise Behavior, Noise Filtering By LSI System, Noise In A Cascade Of 2nd Order Filter, Stability Of Linear Filter

MULTIRATE TECHNIQUES

General Rate-Changing System, Integer-Factor Interpolation And Decimation And Rational-Factor Rate Changing, Efficient Multirate Filter Structures, Optimal Filter Design For Multirate Systems, Multi-Stage Multirate Systems, Over sampling D/As, Perfect-Reconstruction Filter Banks And Quadrature Mirror Filters

APPLICATIONS OF DSP
Introduction to multidimensional DSP and its application to image and video processing, applications of

DSP in communications

Text Books:

1. Salivahanan S, Gyanapriya C, “Digital Signal Processing”, Tata McGraw-Hill,2003
2. John G. Proakis and D.G. Manolakis, *Digital Signal Processing: Principle, Algorithms and Applications*, Prentice Hall, 1997.
3. Rabiner L. R. and Gold B.,“Theory And Applications Of Digital Signal Processing”, Prentice Hall,1992

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC103	NANOTECHNOLOGY	2	0	0	2

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100				

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

Theory: Shrink-down approaches: Introduction, CMOS Scaling, The nanoscale MOSFET, Finfets, Vertical MOSFETs, limits to scaling, system integration limits (interconnect issues etc.), Resonant Tunneling Transistors, Single electron transistors, new storage, optoelectronic, and spintronics devices. Atoms-up approaches: Molecular electronics involving single molecules as electronic devices, transport in molecular structures, molecular systems as alternatives to conventional electronics, molecular interconnects; Carbon nanotube electronics, band structure & transport, devices, applications.

Text Books:

1. Nanoelectronics and information technology, Editor Rainer waser, Wiley CH-2003 T2. Lecture Notes
2. Waser Ranier , Nanoelectronics and Information Technology (Advanced Electronic Materials and Novel Devices), Wiley-VCH (2003) R2. K.E. Drexler , Nanosystems, , Wiley (1992) R3. Research Papers

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC151	Advance Communication Systems Lab	0	0	2	2

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
					20	50	30	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

- **Course Syllabi (Practical):**
  1. Harmonic analysis of a square wave of a modulated wave form.
  2. Observe the Amplitude modulated wave form & measure modulation index. Demodulation of AM signal.
  3. Generation & Demodulation of DSB – SC signal
  4. Modulate a sinusoidal signal with high frequency carrier to obtain FM signal. ; Demodulation of the FM signal.
  5. To observe the following in a transmission line demonstrator kit :

     (a) The propagation of pulse in non-reflecting transmission line.
     (b) The effect of losses in transmission line.

Text Books:

2. Simon Haykins,*Communication Systems*, John Wiley & Sons, Inc., 4th edition, 2001

Reference Books:

1. Proakis J. G. and Salehi M., *Communication Systems Engineering*, Pearson Education, 2002.T
2. Taub H. and Schilling D.L., *Principles of Communication Systems*, Tata McGraw Hill, 2001.

JK Lakshmipat University

Near Mahindra SEZ, Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500/504

INSTITUTE OF ENGINEERING AND TECHNOLOGY

2 Year M. Tech Program

(Branch: Electronics & Communication Engineering)

Batch 2012-14

SEMESTER-TWO

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC152	Digital Signal Processing Lab	0	0	2	2

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
					20	50	30	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Practical):

1. Generation of continuous and discrete elementary signals (periodic and non-periodic) using mathematical expression.
2. Generation of Continuous and Discrete Unit Step Signal.
3. Generation of Exponential and Ramp signals in Continuous & Discrete domain.
4. Continuous and discrete time Convolution
5. Circular Convolution
6. FIR Filter (LP/HP) Using Windowing technique
    a. Rectangular window
    b. Triangular window
    c. Kaiser window
7. N-point FFT algorithm
8. Power Spectral Density of a sinusoidal signals
9. MATLAB program to generate sum of sinusoidal signals
10. MATLAB program to find frequency response of analog(LP/HP)

Text Books:

1. Salivahanan S, Gyanapriya C, “Digital Signal Processing”, Tata McGraw-Hill,2003
2. John G. Proakis and D.G. Manolakis, *Digital Signal Processing: Principle, Algorithms and Applications*, Prentice Hall, 1997.
3. Rabiner L. R. and Gold B.,“Theory And Applications Of Digital Signal Processing”, Prentice Hall,1992

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC123 (Elective I)	Telecom Network Management	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks
20	20	50	10	100	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi:

- Introduction to Telecom Networks :Types of Networks, Network Design Issues, Data Support, Design Tools, Switching Technologies (Circuit Switching, Packet switching, Virtual switching)
- Broadband Telecom Networks: ISDN, Frame Relay, ATM, SONET/ SDH
- Broadband Access Technologies: DSL, Cable Modems, WLL, Optical Wireless, Leased lines, Dynamic Routing
- Routing Technologies: Routing Algorithms for shortest path, Centralized routing, Distributed Routing, Static Routing, Dynamic Routing.
- QoS and Reliability Issues of Telecom Networks :Delay, Jitter, Throughput / Bandwidth, Crosstalk / Interference Issues, Network Reliability and Survivability Issues, Network Protection Mechanisms
- Telecom Network Management :Telecom Network Operation and Maintenance, Traffic Management, Management of Transport Networks, Configuration Management, Fault Management, Security, Network Planning Support, Network Management using SNMP: Object Management, Management Information Base, Traps.

Text Books:

1. Aaron Kershenbaumj "Telecommunication Network Design Algorithms", MGH
2. Mischa Schwatriz, "Telecommunication Networks: Protocols, Modeling and Analysis", Pearson Education.
3. Cole, "Introduction to Telecommunications: Voice, Data and The Internet", Pearson Education

Reference Books:

1. Flood, "Telecommunication Switching, Traffic and Networks", Pearson Education
2. Kundan Mishra, "OSS for Telecom Network", Springer.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC122 (Elective I)	Transmission Line and EM Waves	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks
20	20	50	10	100	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems. Electrostatics – II :Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, Illustrative Problems.
- Magnetostatics :Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy, Illustrative Problems.
- Maxwell's Equations (Time Varying Fields):Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Conditions at a Boundary Surface : Dielectric-Dielectric and Dielectric-Conductor Interfaces, Illustrative Problems .
- EM Wave Characteristics - I:Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization, Illustrative Problems.
- EM Wave Characteristics – II:Reflection and Refraction of Plane Waves – Normal and Oblique Incidences, for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem – Applications, Power Loss in a Plane Conductor, Illustrative Problems.
- Transmission Lines - I :Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion – Condition for Distortionlessness and Minimum Attenuation, Loading - Types of Loading, Illustrative Problems.
- Transmission Lines – II :Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR,UHF Lines as Circuit Elements : λ/4, λ2, λ/8 Lines – Impedance Transformations, Significance of Zmin and Zmax Smith Chart – Configuration and Applications, Single and Double Stub Matching, Illustrative Problems.

Text Books:

1. Elements of Electromagnetics – Matthew N.O. Sadiku, 4 ed., 2008, Oxford Univ.Press.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, 2 ed., 2000, PHI.

Reference Books:

1. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan, 2001, (Tech. India Publications), New Delhi.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEL101 (Elective I)	Digital Electronics and Computer Organization	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks
20	20	50	10	100	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

Unit-I Syllabus - Logic Gates and Circuit :
Gates- OR, AND, NOR, NAND, XOR, XNOR, De Morgan's laws, Boolean laws, Circuit designing techniques SOP, POS, K-Map
Unit-II Syllabus - Combinational Building Blocks

Multiplexers, Encoder, Decoder, Adder and Subtracter
Unit-III Syllabus - Memories

ROMs, PROMs, EPROMs, RAMs, Hard Disk, Floppy Disk, CD-ROM
Unit-IV Syllabus - Sequential Building Blocks

Flip-Flop , RS, D, JK, Master-slave, T flip-flops, Registers and Shift registers, Counters, Synchronous and Asynchronous, Designing method
Unit-V Syllabus - Memory Organization

Basic cell of static and dynamic RAM, Building large memories using chips, Associative memory, Cache memory organization and Virtual memory organization

Text Books:

1. M. Morris Mano and M. D. Ciletti, “Digital Design”, 4th Edition, Pearson Education

2. Pedroni - Digital Electronics & Design, Elsevier

Reference Books:

1. F. Vahid: Digital Design: Wiley Student Edition, 2006

2. J. F. Wakerly, Digital Design Principles and Practices, Fourth Edition, Prentice-Hall, 2005.

3. R. L. Tokheim, Digital electronics, Principles and applications, 6th Edition, Tata McGraw Hill Edition.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC201	Optical Fiber Communication	3	1	0	4

Evaluation Scheme (Theory)									
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation/ Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks
20	20	50	10	100	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Theory)

- Introduction to Optical Communication- Basic optical laws and definitions, Principles of light propagation in fibers, Ray theory, Optical fiber modes and configurations, Step index and graded index fibers, Monomode and multimode fibers, Fiber materials, fiber fabrication, Fiber optic cables. Attenuation, signal distortion in optical fibers, Dispersion-intra modal & inter modal, Dispersion shifted and flattened fiber.
- Optical Sources- LED's- Structure, Materials, Characteristics, Modulation, Power & efficiency, Laser Diodes - Basic concept, Hetro Structure, properties and modulation.
- Optical Detectors - PIN and Avalanche photo diodes, photo detector noise, detector response time, Avalanche multiplication noise. Photo diode materials. Fundamental of Optical Receiver Operation.
- Optical Fiber Communication Systems- Source to fiber coupling, fiber to fiber joints, fiber splicing, fiber connectors. Principal components. Link design calculation, Applications, Wavelength division multiplexing.
- Optical Fiber Measurements- Measurements of Fiber attenuation, Dispersion, refractive index profile, NA & diameter

Text Book(s)

1. Keiser Gerd, "Optical Fiber Communications", Tata McGraw-Hill, Fourth edition 2008.
2. John M. Senior, "Optical Fiber Communication: Principle and Practice", Pearson.

Reference Book(s)

1. Ghatak A.K. and Thyagarajan, "Optical electronics", Cambridge University Press 1991.
2. Gowar J.,"Optical Communication Systems', PHI, second edition, 1993.
3. Khare R.P, "Fiber Optics and Optoelectronics", Oxford University Press 2004.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC202	Wireless and Mobile Communication	3	1	2	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100	20	50	30	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Overview, history and evolution of Wireless communication systems, 2G cellular networks, 2.5G, 3G systems, WLANS /PANS.
- Frequency reuse, Channel assignment, handoff, interference and system capacity, Large Scale propagation & models, Small scale fading and multipath.
- Overview of modulation techniques and their performance in fading and multipath channels, Review of Spread Spectrum techniques and performance in fading channels, Survey of equalization techniques and Equalizers, Polarization frequency, time and space diversity.
- FDMA, TDMA, CDMA and Packet Radio, RF system design and link analysis, Overview of the GSM and CDMA cellular systems.
- Wireless LAN: 802.11x standards and Hyper-LANs, DECT & PACS, Bluetooth, Multicarrier modulations, OFDMA and security issues.

PRACTICAL:

1. Design And Implementation Of Wireless Link Using Various Modulation Techniques:
2. i) MPSK & ii) MQAM
3. Matched Filter - Correlator Equalization
4. Adaptive Filters Used For Equalization
5. Decision Feedback Equalizer
6. AR Estimator And BER Performance Comparison – Burg Method, Covariance Method, Modified Covariance Method, Yule – Walker Method
7. RLS, LMS And MMSE Methods For Estimation
8. Spread Spectrum Modulation Techniques.
9. OFDM Link
10. Channel Models Incorporated With Various Modulation Techniques.

Text Books:

1. Wireless Communication Principles and Practice, Theodore S. Rappaport, Second Edition, Pearson Education, 2002.
2. TB2: Mobile Communication, Jochen H. Schiller, Pearson Education., 2000.

Reference Books:

1. Digital Communications, Bernard Sklar, 2nd Edition, Pearson Education, 2001.
2. Mobile Cellular Telecommunications, Lee, 2nd Edition, McGraw Hill, 1995.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC203	VLSI Technology	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks
20	20	50	10	100	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

INTRODUCTION TO VLSI DESIGN

Historical Perspective, Design Hierarchy, Concepts Of Regularity, Modularity And Locality, VLSI Design Styles, VLSI Design Flow,Computer-Aided Design Technology

MOS INVERTER

Static Characteristics: Introduction, Resistive Load Inverter, Inverters With N Type MOSFET Load, CMOS Inverter, Switching Characteristics And Interconnect Effects, Introduction, Definitions And Calculations Of Delay Times, Inverter Design With Delal Constraints, Estimation Of Interconnect Parasites, Calculation Of Interconnect Delay, Switching Power Dissipation Of CMOS Inverter

CIRCUIT CHARACTERIZATION AND PERFORMANCE ESTIMATION

Delay Estimation, Logical Efforts And Transistor Sizing, Power Dissipation, Interconnect, Design Margin, Reliability

COMBINATIONAL AND MOS SEQUENTIAL LOGIC CIRCUITS

CMOS Logic Circuits, Complex Logic Circuits, Behavior Of MOS Logic Elements, SR Latch Circuit, Clocked Latch And Flip-Flop Circuits, CMOS D-Latch And Edge-Triggered Flip-Flop

DYNAMIC LOGIC CIRCUIT

Pass Transistor Circuits, Voltage Bootstrapping, Synchronous Dynamic Circuit Techniques, Dynamic And High Performance Dynamic CMOS Circuit

DIGITAL SUBSYSTEM DESIGN

Semiconductor Memory Design, Schmitt Trigger, Multivibrator Circuit, Digital Phase Locked Loop, Adders, Multipliers And Shifters

BOOKS RECOMMENDED

1. Kang and Leblebici,“CMOS Digital Integrated Circuits: Analysis and Design”, Tata McGraw-Hill, 3rd Edition, 2003
2. Baker R. Jacob, Li H. W. & Boyce D. E.,“CMOS Circuit Design, Layout And Simulation”, Prentice-Hall Of India, 2nd Edition, 1998
3. Jan M. Rabey, Anantha Chandrakasan, Borivoje Nikolic, “Digital Integrated Circuit”,Pearson Education, 2nd Edition, 3rd Indian Reprint, 2004
4. Weste and Harris,“CMOS VLSI Design: A Circuits and Systems Perspective”, Pearson Education, 3rd Edition, 2002
5. Pucknell and Eshraghian: “Basic VLSI Design”, Prentice Hall of India, 3rd Edition, 2003

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC221 (Elective II)	Advanced Power Electronics	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Power Semiconductor Devices
- fundamental concept of AC to DC Conversion and vice versa also
- Power Factor Improvement, Harmonic Reduction
- Switched-Mode Power Supply; AC Regulators; Cyclo-converters
- Voltage Source Inverters; Pulse Width Modulation
- Current Source Inverter.

Text / Reference books:

1. Rashid.M.H. “Power Electronics Circuits Devices and Application” 3rd edition, Prentice Hall of India.
2. Bimbhra.P.S. “Power Electronics”3rd edition, Khanna Publisher.
3. Singh K.B. & Khanchandani. M.D. “Power Electronics”, Tata McGraw Hill

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC 222 (Elective II)	MEMS	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Introduction: history of MEMS, market for MEMS, overview of MEMS processes, properties of silicon, a sample MEMS process
- Basics of Microtechnology: definitions and terminology, a sample process, lithography and etching. Micromachining: subtractive processes (wet and dry etching), additive processes (evaporation, sputtering, epitaxial growth).
- Fundamental Devices and Processes: basic mechanics and electrostatics for MEMS, parallel plate actuators, pull-in point, comb drives. more electrostatic actuators; MEMS foundries, Cronos MUMPs (multi user MEMS process).
- MUMPs Multi User MEMS Process: review Tang et al. papers; JDS Uniphase MUMPs processing sequence and design rules. MUMPs and SUMMiT: design rules; applications; micro hinges and deployment actuators.
- CMOS MEMS: CMOS foundry processes, integrated IC/MEMS, MEMS postprocessing, applications. Cleanroom lab techniques: clean rooms, gowning procedures; safety, fire, toxicity; acids and basis; photolithography.
- Thermal Transducers: bimorphs, "heatuators", cilia arrays. MicroOptoElectroMechanical Systems (MOEMS): micro scanners, digital mirror display, retinal scanning display. MicroOptoElectroMechanical Systems (MOEMS): grating light valve, corner cube.
- Piezoresistivity; Scanning Probe Microscopy: scanning tunneling microscope (STM), atomic force microscope (AFM).
- Wireless MEMS: mechanical and electrical resonators, Q-factor, switches, filters. Power for MEMS: thin film batteries, micro fuel cells, energy fields.
- MEMS Packaging and Assembly: microassembly: serial and parallel, deterministic and stochastic; microgrippers: HexSil process; packaging techniques.
- The Future of MEMS: bioMEMS - neural implants, gene chips, diagnostic chips; MEMS in space; mechanical computers; invisible and ubiquitous computing.

Text Books:

1. An Introduction to Microelectromechanical Systems Engineering by N. Maluf

Reference Books:

1. The MEMS Handbook, Mohamed Gad-el-Hak, CRC Press, 12-Dec-2010

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC 223 (Elective II)	Multimedia Systems	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.
- Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.
- Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class.
- Action Script II : Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.Application Development : An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.
- Multimedia data compression : Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).
- Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.
- Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).

Text Books:

1. Fudamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education.
2. Essentials ActionScript 2.0, Colin Moock, SPD O,REILLY.

Reference Books:

1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
2. Macromedia Flash MX Professional 2004 Unleashed, Pearson.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC251	Optical Communication Lab		0	2	2

Evaluation Scheme (Theory)									
Mid Term Test - I	Mid Term Test - II	End Term Test	Class Participation/ Additional Continuous Evaluation*	Total Marks	Mid Term Test - I	End Term Test	Class Participation	Additional Continuous Evaluation *	Total Marks
					20	20	50	10	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Syllabus (Practical)

1. Introduction To FOT Kit.
2. Setting Of Fiber Optic Analog Link Using OFT Kit.
3. Setting Of Fiber Optic Digital Link Using OFT Kit.
4. Finding The Losses And NA For Given Optical Fiber Using OFT Kit.
5. Study Of The,Light Source And Power Meter.
6. Plotting The Characteristics Of LED And Photo Transistor.
7. Introduction to Photonics CAD 1.6 or Optisim.
8. Performance Analysis Of Single Channel Fiber Optic Communication Link Using Photonics CAD or Optisim.
9. Performance Analysis Of Multichannel WDM Link Using Photonics CAD or Optisim

Text Book(s)

1. Keiser Gerd, “Optical Fiber Communications”, Tata McGraw-Hill, Fourth edition 2008.
2. John M. Senior, “Optical Fiber Communication: Principle and Practice”, Pearson.

Reference Book(s)

1. Ghatak A.K. and Thyagarajan, “Optical electronics”, Cambridge University Press 1991.
2. Gowar J.,“Optical Communication Systems’, PHI, second edition, 1993.
3. Khare R.P, “Fiber Optics and Optoelectronics”, Oxford University Press 2004.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTSEM201	Seminar	0	0	4	2

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
-	-	-	-	-	50	40	10	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

Operation Procedure

1. Student has to devote full semester for **MTSEM201** course.
2. Student has to report to the Supervisor regularly.
3. Seminars' evaluation has to be carried out in the presence of a two member Committee comprising.
4. Experts in the relevant area constituted by the Supervisor.
5. Final Thesis to be submitted has to be in formal hard bound cover bearing of the Institute emblem.

Reference Books:

1. Based on literature survey to be done with peer reviewed journals.

JK Lakshmipat University

Near Mahindra SEZ, Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500/504

INSTITUTE OF ENGINEERING AND TECHNOLOGY

2 Year M. Tech Program

(Branch: Electronics & Communication Engineering)

Batch 2012-14

SEMESTER-THREE

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTLA201	Advanced Professional Communication	1	1	2	2

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- Introduction to the course.
- Characteristic Features of Effective Communication and Ways to Overcome Barriers to Communication
- Importance of Non-Verbal Communication
- Importance of Paralinguistic Features and Vocal Cues
- Group Discussion, Job Interviews
- Public Speaking
- Business Letters and Resume
- Business Reports, Technical Proposals
- E-mail Writing, Other Business Writings

Text Book:

1. Sanjay Kumar and Pushp Lata, *Communication Skills,* New Delhi: OUP, 2011.

Reference Books:

1. Meenakshi Raman and Sangeeta Sharma, Technical Communication: Principles and Practice, Second Edition, New Delhi: OUP, 2011.
2. Krishna Mohan and Meenakshi Raman, Effective English Communication, New Delhi: Tata-McGraw Hill, 2000.
3. Krishna Mohan and N.P.Singh, Speaking English Effectively, New Delhi: Macmillan,1994.
4. V. Sasikumar and P.V. Dhamija, Spoken English: A Self-Learning Guide to ConversationPractice, Tata-McGraw Hill, 2007.
5. Norman Lewis, Word Power Made Easy, Delhi: GoyalSaab Publishers and Distributors, 1994.
6. A.J.Thomson and A.V.Martinet, A Practical English Grammar, 4th Edition, New Delhi: OUP, 1999.
7. Asha Kaul, Business Communication, Second Edition, New Delhi: PHI, 2010.
8. Edgar Thorpe and Showick Thorpe, Objective English, 2nd Edition, New Delhi: Pearson Education, 2008.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTDS301	Dissertation Stage - I	-	-	-	8

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
-	-	-	-	-	-	-	-	-

Operation details:

- Each Student will be assigned by Director, IET to a faculty member who will act as the instructor. Students and faculty members covering a broad area will be grouped in a panel.
- Within 2 weeks of registration, the student should submit the work plan with time line and developmental activities in consultation with his assigned supervisor. Two copies of written outline of the total work should be submitted to the supervisor within 2 weeks.
- Mid semester grading will be done by the supervisor based on the performance of the student in research and development activities. The student should submit the Mid semester report to the supervisor in the 9^{th} week of the semester, which shows the progress of the student till the mid semester.
- The student is also required to submit End-semester report which provides the details of work done by the student in research and development area. End semester report should be submitted to the supervisor in the 15^{th} week of the semester. The end semester report should also contain a research proposal.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC321 (Elective – III)	Coding Theory and Practice	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- **Introduction:** The *q*-ary symmetric channel, Maximum-likelihood decoding, Error correction, error detection, and erasure correction
- L**inear codes:**Representation through generator and parity-check matrices,Syndrome decoding, Hamming codes.
- **Introduction to finite fields and double-error-correcting codes:** Irreducible polynomials, Primitivity, Double-error-correcting codes
- **Bounds on the parameters of codes:** The Singleton bound; MDS codes, The Hamming sphere-packing bound; perfect codes, The Gilbert-Varshamov bound, Asymptotic bounds.
- **Reed-Solomon and related codes:** Generalized Reed-Solomon (GRS) codes, Decoding GRS codes using Euclid's algorithm,The Berlekamp-Massey decoding algorithm, BCH codes and alternant codes as subfield subcodes of GRS codes, Concatenated codes.
- **Structure of finite fields and cyclic codes:** Cyclotomic cosets and minimal polynomials, Cyclic codes BCH codes as cyclic codes, The BCH bound.

Text Books:

1. Blahut, R. E. *Theory and Practice of Error-Control Codes*. Reading, MA: Addison-Wesley, 1983. ISBN: 0201101025.
2. MacWilliams, F. J., and N. J. A. Sloane. *The Theory of Error Correcting Codes*. Amsterdam, Netherlands: North-Holland, 1978. ISBN: 0444851933.
3. Van Lint, J. H. *Introduction to Coding Theory*. 3rd ed. Berlin, Germany: Springer-Verlag, 1999. ISBN: 3540641335.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC 324 (Elective – III)	Computer Communication Network and Internet	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- **Introduction :**OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks ,Arpanet, Internet, Network Topologies WAN, LAN, MAN.
- **Physical Layer :** Transmission media copper, twisted pair wireless, switching and encoding asynchronous communications; Narrow band, broad band ISDN and ATM.
- **Data link layer :** Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Slip, Data link layer in HDLC, Internet, ATM.
- **Medium Access sub layer :** ALOHA, MAC addresses, Carrier sense multiple access. IEEE 802.X Standard Ethernet, wireless LANS. Bridges.
- **Network Layer :** Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing.
- **Dynamic routing:** Broadcast routing. Rotary for mobility. Congestion, Control Algorithms–General Principles – of Congestion prevension policies. Internet working: The Network layer in the internet and in the ATM Networks.
- **Transport Layer:** Transport Services, Connection management, TCP and UDP protocols; ATM AAL Layer Protocol.
- **Application Layer:** Network Security, Domain name system, SNMP, Electronic Mail; the World WEB, Multi Media.

Text Books:

1. Forouzan, Introduction to Data Communications and Networking, 4th Edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi, 2004.

Reference Books:

1. William Stallings, Data and Computer Communications, Seventh Edition, Pearson Education, Delhi.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC 325 (Elective – III)	RF Circuits & Systems	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

RF CIRCUITS & SYSTEMS

INTRODUCTION

RF Behavior of Passive Components, Chip Components

TRANSMISSION LINE ANALYSIS

Transmission Lines, Equivalent Circuit Representation, Theoretical Foundation, Circuit Parameters For A Parallel Plate Transmission Line, General Transmission Line Equation,Microstrip Transmission Lines, Terminated Lossless Transmission Line, Special Termination Conditions, Sourced And Loaded Transmission Line, Problems

SMITH CHART

From Reflection Coefficients to Load Impedance, Impedance Transformation, Admittance Transformation, Parallel and Series Connection, Problems

SINGLE- AND MULTIPORT NETWORKS

Basic Definitions, Interconnecting Networks, Network Properties And Application,Scattering Parameters- Definition And Meaning Of S- Parameters, Problems

RF FILTERS DESIGN

Basic Resonator And Filter Configurations, Special Filter Realizations, Filter Implementation

MATCHING AND BIASING NETWORKS

Impedance Matching using Discrete Components, Microstrip Line Matching Networks, Amplifier Classes of Operation & Biasing Networks, Problems solutions

POWER DIVIDERS AND DIRECTIONAL COUPLERS

The T - Junction Power Divider, The Wilkinson Power Divider, The Quadrature (90°) Hybrid, Coupled Line Directional Couplers, Problems

BASIC BLOCKS IN RF SYSTEMS

Receiver And transmitter Architectures, Low Noise Amplifier Design, Design And Implementation Of Various Mixers

RF OSCILLATORS & SYNTHESIZERS

Basic Topologies, VCO And Definition of Phase Noise, Noise Power Trade-Off,Resonator Less VCO Design, Quadrature And Single-Sideband Generators, PLLS,Various RF Synthesizer Architectures And Frequency Dividers

DESIGN ISSUES

Linearization Techniques, Power Amplifier Design, Integrated RF Filters

MMIC

Materials, MMIC Growth, Thin Film Formation, Hybrid IC Formation

Text and Reference Books:

1. Ludwig Reinhold and Bretchko Powel, “RF Circuit Design”, Pearson Education, Reprint 2004
2. Pozar M. David, “Microwave Engineering”, John Wiley & Sons, Inc., 1999
3. Liao Samuel, “Microwave Devices And Circuits”. Pearson Education, Second Reprint, 2006
4. Bhat Bharathi and Koul Shibon,“Stripline-Like Transmission Lines For MIC”, New Age International, Reprint 2003
5. Razavi B., “RF Microelectronics”, Prentice-Hall PTR,1998

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC322 (Elective – III)	Digital Image Processing	3	1	2	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	100	20	50	30	100

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

**The ratio of weightage between Theory and Practical content will be 60%: 40%

Course Syllabi (Theory):

- Introduction:Background, Digital Image Representation, Fundamental Steps in Image Processing, Elementsof a Digital Image Processing System.
- Digital Image Fundamentals:Elements of Visual Perception, Light and Electromagnetic Spectrum, Image Sensing and Image Acquisition, Sampling and Quantization, Some Basic Relationships between Pixels
- Image Enhancement in the Spatial Domain: Background, Basic Gray Lavel Transform, Histogram, Processing, Use of Arithmatic/ Logic Operations, Basics of Spatial filtering, Smoothing spatial filters, Sharpning Spastics filters
- Image Enhancement in the Frequency Domain: Background, Introduction to the Fourier Transform and the Frequency Domain Smoothing Frequency Domain Filter, Sharpning Frequency Domain Filters, Homomorphic filter Implementation
- Image Restoration Image Degradation And Restoration Processes; Noise 'Models - Spatial Properties, Noise Probability Density Functions, Periodic Noise, Estimation Of Noise Parameters; Restoration In The Presence Of Noise and Mean Filters, Order-Statistics Filters, Adaptive Filters; Linear Position-Invariant Degradations And Estimation; Geometric Transformations - Spatial Transformation, Gray-Level Interpolation.
- Morphological Image Processing Preliminaries-Set Theory And Logic Operations In Binary Images; Basic Morphological Operations - Opening, Closing Operators, Dilation And Erosion; Morphological Algorithms - Boundary Extraction, Region Filling, Extraction Of Connected Components, Convex Hull, Thinning, Thickening, Skeletons; Extension Of Morphological Operations To Gray-Scale Images.
- Image Segmentation Detection Of Discontinuities â€" Point, Line And Edges; Edge Linking And Boundary Detection - Local Processing, Global Processing Using Hough Transform; Thresholding - Local, Global And Adaptive; Region-Based Segmentation - Region Growing, Region Splitting And Merging; Motion Detection.

PRACTICALS:

1. Spatial Gray Level Resolution And Zooming, Shrinking, Bilinear Interpolation
2. Creation Of Negative Image And Gamma Correction
3. Thresholding Applied To Image
4. Bit Plane Slicing Of An Image
5. Histogram Equalization And Matching For B/W And Color Images, Finding Mean And Variance
6. Noise Generation In The image Using Gaussian Noise And Salt & Pepper Noise, Finding Mean And Variance
7. Noise Reduction Using Median Filter
8. Periodic Noise Reduction Using Notch Filter
9. High Pass And Low Pass Filter Applied To Image
10. Function Implementation For Reading, Writing & Rotating Images
11. Point Detection And Edge Detection Of The Image
12. Correlation Between Two Images
13. Pseudo Color Processing

Text Books:

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

Reference Books:

1. Castleman, “Digital Image Processing”, Prentice Hall.

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTEC 323 (Elective – IV)	Antenna Theory & Techniques	3	1	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
20	20	50	10	-	-	-	-	-

*Additional Continuous Evaluation: Quizzes/Assignments/Presentations/Practical Records/Mock Interviews/others

Course Syllabi (Theory):

- **Electromagnetic Radiation:** Radiation from a current element in free space, Quarter and half wave antenna.
- **Fundamentals of Antennas:** Patterns, Beam area, Radiation intensity, Gain, Beam width & Directivity, Efficiency, Polarization, Effective length & aperture, Antenna temperature, Bandwidth, Impedance, Reciprocity Theorem
- **Linear wire antennas and other basic Radiators:**Effect of ground on antennas**,** Resonant & non-resonant antennas,Long wire, Loop, Helical, Horn, Slot, Patch(Microstrip), Surface wave & Leaky wave-antennas
- **Antenna Arrays:** Two-element array, N-element linear arrays, Broadside, end fire, colinear& combinational arrays, multiplication of patterns, binomial arrays, Long-wire arrays, Horn and slot arrays, Phased arrays
- **Reflector antennas and Lens antennas:** Focusing and collimation, Feed radiators, Plane, Corner, Parabolic and Cassegrain-reflectors, Real dielectric and artificial dielectric lenses, Delay lens, E-plane & H-plane Metal plate lens, Luneberg lens
- **Broadband and Frequency independent Antennas:** Broadband principle, Biconical antennas, Folded dipoles, Superturnstile antenna, Frequency independent(log periodic) antenna
- **Radio Wave propagation:** Mechanism, Reflection, refraction, interference and diffraction of radio waves, Ground, Space and Sky wave propagation
- **Antenna Measurements:** Basic concepts, Sources of errors, measurement ranges, measurement of different antenna parameters

Text Books:

1. Antenna & Wave Propagation, K.D. Prasad
2. Elements of Electromagnetics, Sadiku

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTPP301	Professional Practice	2	0	0	4

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
-	-	-	-	-	-	-	-	-

Operation details:

- Each Student will be assigned by Director, IET to a faculty member who will act as the instructor. Students and faculty members covering a broad area will be grouped in a panel. Panel will normally consists of 4 to 8 students and 2 to 4 faculty members.
- Within one week of registration, the student should plan the details of topics of lectures, laboratory experiments and developmental activities and broad topic of research etc. in consultation with his assigned instructor. Two copies of written outline of the total work should be submitted to the instructor within a week.
- In a particular discipline group, instructors belonging to broad areas will from the panel and will nominate one of them as the panel coordinator. The coordinator together with other instructors will draw a complete plan of lectures to be delivered by all the students in the semester. Each student will present 3 to 4 lectures, which will be attended by all students and instructors. There lectures will be evenly distributed over the entire semester the coordinator will announce the schedule for the entire semester and will fix suitable meeting time in the week.
- Each student will also make one presentation about his finding on the broad topic of research. The final report has to be submitted on the form of a complete research proposal. The reference and bibliography should be cited in a standard format. The research proposal should contain (i) topic of research (II) background and current status of research work in the area as evidence from the literature review (III) scope of the proposed work (IV) Methodology (V) Reference and bibliography.
- A report covering laboratory experiments, developmental activities and code for professional conduct and ethics in the discipline.
- The panel will jointly evaluate all components of the course throughout the semester and the mid semester grade will be announced by the respective instructor to his student.

JK Lakshmipat University

Near Mahindra SEZ, Mahapura, Ajmer Road, Jaipur 302 026

Ph.: +91-141-7107500/504

INSTITUTE OF ENGINEERING AND TECHNOLOGY

2 Year M. Tech Program

(Branch: Electronics & Communication Engineering)

Batch 2012-14

SEMESTER-FOUR

Detailed Syllabus

&

Scheme of Examination

Course code	Course Title	Teaching Scheme			
		L	T	P	Credits
MTDS401	Dissertation Stage - II	-	-	-	20

Evaluation Scheme (Theory)					Evaluation Scheme (Practical)			
Mid Term Test – I	Mid Term Test - II	End Term Test	Additional Continuous Evaluation*	Total Marks	Mid Term Test	End Term Test	Additional Continuous Evaluation*	Total Marks**
-	-	-	-	-	-	-	-	-

Course Syllabi:

Operation of the course

a) The student should immediately chalk out a plan of work in Consultation with his supervisor. Current literature (journals, books, etc.) must be methodically reviewed and the status of the work in the field must be considered. The detailed outline of work must reflect a survey of the current literature in the same area and must include topic of research, objective, background of previous work in the area, methodology and a work plan with a time schedule clearly indicating the intermediate milestones and the estimated time to achieve the same along with references and bibliography.

b) Within two weeks of registration, the student should give his Dissertation particulars to the Director-IET office through supervisor in TS-1 Proforma.

c) The student should regularly interact with his supervisor and present seminars and submit reports on the scheduled dates. Proposed examiners and other faculty in relevant area may be requested to attend the presentations.

d) Supervisor will announce the Mid-semester grade to his student and send the MID-SEM Evaluation Form to the Director-IET office.

e) TWO typed copies of Final Dissertation Report and Abstract are to be submitted to the supervisor on or before the last day of class work in each semester. Supervisor will retain his copy and send the remaining ONE copy after the viva voce examination along with the Final Evaluation Form and Dissertation Abstract to the Director-IET Office.

f) The following format for Dissertation Abstract should be used

Format for submission of Dissertation Abstract

Dissertation Title :

Supervisor :

Semester : First/Second Session :

Name of Student : ID No. :

Abstract

Abstract in the above format should also be included in the bound report.

g) Every student has to sign his attendance regularly with the supervisor or as per the alternative arrangement made by the supervisor. An attendance sheet is being provided for this purpose to the supervisor.
h) The candidate should apply and seek prior permission of his supervisor for going on leave for any genuine needs. If the leave of absence exceeds **seven** days in the entire semester, the recommended final grade may be revised by the Director-IET in consultation with the supervisor.
i) A separate Dissertation topic has to be assigned to individual students. Wherever the broad area is same, the aspects to be researched by an individual candidate should be clearly focused and spelt out.
j) Utmost care should be taken in the preparation of the FINAL REPORT. A check-list of various items is provided and students should carefully go through these. Supervisors are also requested to examine the draft of the FINAL REPORT keeping in view the items in the check-list.

2. EVALUATION

Evaluation in this course is essentially individual oriented. The various instruments of evaluation along with the weightage of components are given below:

Component	Weightage	Week in which due
Viva –I	15	5th week
Mid. sem. written report	15	10th week
Mid. sem. presentation	15	10th week
Viva –II	15	15th week
Final Dissertation*	25	Last day of class work
Final Viva-voce*	15	Actual date announced by Director-IET

***Final Viva-voce examination and evaluation of the Dissertation is to be jointly done by the Supervisor and the examiner appointed by the Director-IET. The other components are to be evaluated by the supervisor and the details are to be made available to the examiner at the time of final viva. Supervisor will send the copy of Dissertation report to the examiner well in advance. Before sending he should check the contents as per checklist and sign the 'Certificate' page.**

The evaluation will recognize the day-to-day work involvement and punctuality of the student in his work. Evaluation in various components shall take into account work progress and achievements, technical/professional competence, documentation and expression, initiative and originality, punctuality and reliability, self-reliance, and acquisition of special skills. The student should extend full cooperation to his supervisor and interact with him in advance about the time, venue and mode of each evaluation. He should be in constant touch with his supervisor. Supervisor may require his student to sign the attendance sheet before a particular time on each working day.

Grading will be done mainly on the basis of the progress made towards attaining the overall objectives of the Dissertation. The supervisor shall evaluate various prescribed components of evaluation before the submission of final Dissertation. The supervisor shall evaluate the various prescribed components of evaluation before the submission of final report. He/she should seek utmost participation of examiner by inviting him to the various seminars. A full time student is normally registered for 20 credits when registered. Supervisor can reduce/increase the prescribed credits subject to a minimum of 15 and maximum of 25 credits depending on the time and effort devoted by the individual student. Supervisor should maintain all pertinent records of his student. Departures in the number of credits to be registered may be decided by the Director-IET. The final report and performance in the final viva are to be jointly evaluated by the Supervisor and examiner appointed by the Director-IET. Evaluation in various components can be done on the basis of marks or grades. However, the recommendations for the final award shall invariably be made in terms of one of the prescribed letter grade**.** The student will have to defend the work appearing in his/her Dissertation before the panel of examiners. Immediately after the final viva, ONE copy each of the Dissertation Report and Dissertation Abstract along with the completed Final Evaluation Form are to be submitted to the Director-IET office by the supervisor. The student should also ensure with his supervisor so that these reach the Division well before the last date of comprehensive examination. Supervisor should check that he has signed the 'Certificate Page'.

3. COURSE NOTICES

Notices pertaining to this course will be displayed on Notice Boards by the supervisor.

4. GENERAL

a) It is the responsibility of the student to ensure continuous interaction with his Supervisor.

b) Prescribed formats of the Cover/Title page and certificate from the supervisor should be adhered to in the preparation of final Dissertation Report. Check-list of items for the preparation of the FINAL REPORT should also be consulted. The following sequence may be followed in the preparation of the Dissertation Report:

- Title page (inner cover)
- Acknowledgement
- Certificate from the Supervisor
- List of Symbols & Abbreviations used
- Dissertation Abstract
- Table of contents
- Chapters 1, 2, 3, etc.
- Conclusion
- Appendices
- Bibliography/References
- List of Publications/Conference Presentations, if any.

c) The registration in Dissertation course is normally after the completion of coursework. 15-20 credits of Dissertation will be assigned at the time of registration. Credits put upto a maximum of 25 may be permitted depending upon the total time and effort put in by an individual student.