M.D.UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
MASTER OF TECHNOLOGY DEGREE COURSE IN
ELECTRONICS & TELECOMMUNICATION ENGINEERING
SEMESTER-I

Sr.No.	Course No.	Course No.	Teaching Schedule			Marks			Credits			Duration of Exam
			L	T	P	Sessional	Exam	Total	Sessional	Exam	Total	
1	MTETE-101	Modern Digital Communication Techniques	4	-	-	50	100	150	2	4	6	3
2	MTETE-102	Information Theory, Coding & cryptography	4	-	-	50	100	150	2	4	6	3
3	MTETE-103	Telecommunication switching & networks	4	-	-	50	100	150	2	4	6	3
4		Elective-I	4	-	-	50	100	150	2	4	6	3
5		Elective-II	4	-		50	100	150	2	4	6	3
6	MTETE-111	Communication System Engineering Lab	-	-	3	50	50	100	2	2	4	3
7	MTETE-112	Seminar-I – On Pre-thesis Work-1	-	-	3	50	50	100	2	2	4	3
	TOTAL		20		6	350	600	950	14	24	38	

ELECTIVE –I

1. **Adaptive Signal Processing (MTETE-104)**
2. **Satellite communication system (MTETE-105)**
3. **Digital Integrated Circuit Design (MTETE-106)**
4. **Mathematics for communication engineering (MTETE-107)**

ELECTIVE –II

1. **Fiber-optics Component & Devices (MTETE-108)**
2. **Computational intelligence (MTETE-109)**
3. **Semiconductor Device Modeling & Simulation (MTETE-110)**

NOTE:

1. The paper setter shall set each theory paper of 100 marks covering the entire syllabus. However, the examiner shall evaluate the performance of the student in the theory paper finally by assigning one of the grades out of A, A(-), B, B(-), C, C(-), D & F. The Examination of practical courses shall also be evaluated on the basis of three grades.
2. The Sessionals of Theory/Practical Courses shall also be evaluated on the basis of these grades.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.
4. The Grading System is defined at the end of the Scheme of Studies & Examinations & will be supplied by the Univ. to the examiner(s)

M.D.UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
MASTER OF TECHNOLOGY DEGREE COURSE IN
ELECTRONICS & TELECOMMUNICATION ENGINEERING
SEMESTER-II

Sr.No.	Course No.	Course No.	Teaching Schedule			Marks			Credits			Durat-ion of Exam
			L	T	P	Sessional	Exam	Total	Sessional	Exam	Total	
1	MTETE-201	Microwave & antenna Engineering	4	-	-	50	100	150	2	4	6	3
2	MTETE-202	Wireless Communication	4	-	-	50	100	150	2	4	6	3
3	MTECE-203	Digital Image Processing	4	-	-	50	100	150	2	4	6	3
4	MTETE-204	Wireless sensor Network	4	-	-	50	100	150	2	4	6	3
5		Elective-I	4	-	-	50	100	150	2	4	6	3
6	MTETE-208	Design & Simulation Lab	-	-	3	50	100	150	2	4	6	3
7	MTETE-209	Seminar On Pre- Thesis Work-2 & Comprehensive Viva	-	-	3	50	100	150	2	4	6	3
	TOTAL		20		3	350	600	950	14	24	38	

ELECTIVE –I

1. **Simulation & Modeling (MTETE-205)**
2. **ASIC & SOC Design (MTETE-206)**
3. **Internet & Web Technology (MTETE-207)**
4. **Radar System Engineering (MTETE-210)**

NOTE:

1. The paper setter shall set each theory paper of 100 marks covering the entire syllabus. However the examiner shall evaluate the performance of the student in the theory paper finally by assigning one of the grades out of A, A(-), B, B(-), C, C(-), D & F. The Examination of practical courses shall also be evaluated on the basis of three grades.
2. The Sessionals of Theory/Practical Courses shall also be evaluated on the basis of these grades.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.
4. The Grading System is defined at the end of the Scheme of Studies & Examinations & will be supplied by the Univ. to the examiner(s)

M.D.UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
MASTER OF TECHNOLOGY DEGREE COURSE IN
ELECTRONICS & TELECOMMUNICATION ENGINEERING
SEMESTER-III

Sr.No.	Course No.	Course No.	Teaching Schedule			Marks			Credits			Durat-ion of Exam
			L	T	P	Sessional	Exam	Total	Sessional	Exam	Total	
1	MTETE-301	Project Management	4	-	-	50	100	150	2	4	6	3
2	MTETE-302	Research Methodology	4	-	-	50	100	150	2	4	6	3
3	MTETE-303	Optimization Techniques	4	-	-	50	100	150	2	4	6	3
4	MTETE-304	Dissertation (Phase-I)	-	-	4		100	100	4	-	4	-
5	MTETE-305	Project	-	-	4	50	50	100	2	2	4	3
6	MTETE-306	Seminar	-	-	2	50	-	50	2		2	
	TOTAL		12		10	250	450	700	14	14	28	

NOTE: 1The paper setter shall set each theory paper of 100 marks covering the entire syllabus. However,the examiner shall evaluate the performance of the student in the theory paper finally by assigning one of the grades out of A, A(-), B, B(-), C, C(-), D & F. The Examination of practical courses shall also be evaluated on the basis of three grades.

2. The Sessionals of Theory/Practical Courses shall also be evaluated on the basis of these grades.

3. The choice of students for any elective shall not be binding on the Deptt. to offer it.

4. The Grading System is defined at the end of the Scheme of Studies & Examinations & will be supplied
by the Univ. to the examiner(s)

M.D.UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR
MASTER OF TECHNOLOGY DEGREE COURSE IN
ELECTRONICS & TELECOMMUNICATION ENGINEERING
SEMESTER-IV

Sr.No.	Course No.	Course No.	Teaching Schedule			Marks			Credits			Duration of Exam
			L	T	P	Sessional	Exam	Total	Sessional	Exam	Total	
1	MTETE-401	Dissertation	-	-	20	150	600	750	6	24	30	3
	TOTAL		-	-	20	150	600	750	6	24	30	

NOTE:

1. The paper setter shall set each theory paper of 100 marks covering the entire syllabus. However, the examiner shall evaluate the performance of the student in the theory paper finally by assigning one of the grades out of A, A(-), B, B(-), C, C(-), D & F. The Examination of practical courses shall also be evaluated on the basis of three grades.
2. The Sessionals of Theory/Practical Courses shall also be evaluated on the basis of these grades.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.
4. The Grading System is defined at the end of the Scheme of Studies & Examinations & will be supplied by the Univ. to the examiner(s)

Master of Technology
Electronics
&
Telecommunication Engineering

(Scheme of Studies & Examination)

M.D. University, Rohtak

(Haryana)

MTETE-101 **Modern Digital Communication Techniques**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1 Deterministic & Random Signal Analysis

Bandpass & Lowpass Signals, Lowpass Equivalent of Bandpass Signals, Energy Considerations, Lowpass Equivalent of a Bandpass System. Vector Space Concepts, Signal Space Concepts, Orthogonal Expansions of Signals, Gram-Schmidt Procedure. Bounds on Tail Probabilities, Limit Theorems for Sum of Random Variables. Complex Random Vectors. WSS Random Process, Cyclostationary Random Process, Proper and Circular Random Process, Markov Chains. Sampling Theorem for Band-limited Random Process, The Karhunen-Loeve Expansion. Banpass and Lowpass Random Processes.

Unit-2 Digital Modulation Scheme

Representation of Digitally Modulated Signals, Memoryless Modulation Methods; Pulse Amplitude Modulation, Phase Modulation, Quadrature Amplitude Modulation, Multidimensional Signaling. Signaling Schemes With Memory; Continuous-Phase Frequency-Shift Keying, Continuous-Phase Modulation. Power Spectrum of Digitally Modulated Signals; Power Spectral Density of a Digitally Modulated Signal With Memory, Power Spectral Density of Linearly Modulated Signals, Power Spectral Density of Digitally Modulated Signals With Finite Memory, Power Spectral Density of Modulated Schemes With a Markov Structure, Power Spectral Density of CPFSK and CPM Signals.

Unit-3 Optimum Receivers for AWGN Channels

Waveform and Vector Channel Models; Optimum Detection for a General Vector Channel. Waveform and Vector AWGN Channels; Optimal Detection for the Vector AWGN Channel, Implementation of the Optima Receiver for the AWGN Channels. Optimal Detection and Error Probability for ASK, PAM,PSK AND QAM Signaling.

Unit-4 Carrier and Symbol Synchronization

Signal Parameter Estimation; The Likelyhood Function, Carrier Recovery and Symbol Synchronization in Signal Demodulation. Carrier Phase Estimation; Maximum Likelyhood Carrier Phase Estimation, The Phase-Locked Loop, Effect of Additive Noise in the Phase Estimate. Symbol Timing Estimation; Maximum Likelyhood Timing Estimation.

Unit-5 Digital Communication Through Band-Limited Channels

Characterization of Band-Limited Channels. Signal Design for Band-Limited Channels; Design of Band-Limited Signals for No Intersymbol Interference-The Nyquist Criterion, Optimum Maximum-Likelihood Receiver.

Unit-6 Multichannel and Multicarrier Systems

Multichannel Digital Communications in AWGN Channels; Binary Signals, M-ary Orthogonal Signals. Multicarrier Communications; Single Carrier verses Multicarrier Modulation, Capacity of a Nonideal Linear Filter Channel, OFDM, Modulation & Demodulation in an OFDM, An FFT Algorithm Implementation of an OFDM System

Unit-7 Spread Spectrum Signals for Digital Communication

Model of Spread spectrum Digital Communication System. Direct Sequence Spread Spectrum Signals; Error Rate Performance of the Decoder, Some Applications of DS Spread Spectrum Signals. Frequency-Hopped Spread-Spectrum Signals; Performance of FH Spread Spectrum Signals in an AWGN Channel, A CDMA System Based on FH Spread Spectrum Signals.

Text Book

1. John G. Proakis and Masoud Salehi, ***Digital Communication***, McGraw-Hill, 5th Edition

Reference Books

1. Simon Haykin, ***Digital Communication***, willy

2. Tube & Schilling, ***Principle of Communication***, PHI

MTETE-102 **Information Theory, Coding and Cryptography**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1 Source Coding
Introduction to information theory, uncertainty of information, Information measure, entropy, source coding Theorem, Huffman Coding, runlength encoding, rate distortion function, JPEG and MPEG standards in image compression.
Unit-2 Channel Capacity and Coding
Channel models, Channel Capacity, Channel Coding, Information Capacity Theorem, The Shannon Limit.
Unit-3 Error Control Coding
Linear Block Codes: Introduction, Basic definition, equivalent codes, parity - check matrix, decoding, syndrome decoding, Perfect Codes, Hamming Codes, Optimal Linear codes.
Unit-4 Cyclic Codes
Introduction polynomials, The division Algorithm, Method for generating cyclic codes, Burst Error correction, Fire Codes, Golay Codes, CRC Codes, Circuit implementation.
Unit-5 Bose Chaudhuri Hocquenghem (BCH)
Introduction, Primitive elements, minimum polynomials, Examples of BCH codes, Decoding of BCH codes, Recd - Solomon codes.
Unit-6 Convolution Codes
Introduction, Tree Codes and Trellis Codes, Polynomial description, The Generating function, Matrix Description, Viterbi Decoding, Distance bounds, Turbo Codes, Turbo Decoding.
Unit-7 Trellis Coded Modulation (TCM)
Introduction, the concept of coded modulation, Mapping by set Partitioning, Design rules, TCM Decoder.
Unit-8 Coding for Secure Communication, Cryptography
Introduction, encryption techniques, Symmetric cryptography, data encryption standard, Asymmetric Algorithm the RSA Algorithm.

Text Books:
*1. Ranjan Bose,**Information Theory, Coding and Cryptography**, 2nd Edn., Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 2008. ISBN-10: 0-07-066901-5, ISBN-13: 978-0-07-066901-7.*

Reference Books:

*1. R. Avudaiammal,**Information Coding Techniques**, 2nd Edn., Tat McGraw-Hill Education Pvt. Ltd., New Delhi. ISBN(10): 0-07-067282-2, ISBN(13): 978-0-067282-6.*
*2. J. G. Proakis, **Digital Communication**, 3rd Edition, McGraw-Hill Publication,.*

MTETE-103-E **Telecommunication Switching & Networks**

L	T	P
4	-	-

	Exam :	Marks	Credit
Theory :		100	4
Sessional :		50	2
Total :		150	6
Duration of Exam :		3hrs.	

Unit-1

Introduction

Evolution, simple telephone communication, basis of switching system, telecommunication networks.

Electronic space division switching

Stored program control, centralized and distributed SPC, software architecture,application software, enhanced software, two and three stage networks.

Time Division Switching

Basic time division space switching, basic time division time switching, time multiplexed space and time switching, combination switching, three-stagecombination switching.

Unit-2

Traffic Engineering

Network traffic load and parameters, Grade of service, modelling switchingsystems, incoming traffic, blocking models and loss estimates.

Telephone Networks

Subscriber loop systems, switching hierarchy and routing, transmission plan,transmission systems, signalling techniques

Unit-3

Data Networks

Data transmission in PSTN, switching techniques, Data communicationarchitecture, link-to-link layers, end-to-end layers, satellite based datanetworks, LAN, MAN, Fibre optic networks, an overview of data network standards Integrated Service Digital Network, motivation, new services, transmissionchannels, signalling, service characterization, ISDN standards, broad bandISDN, voice data integration.

Reference Books:

1. *Thiagarajan Viswanathan,**Telecommunication Switching Systems and Networks** by, PHI Learning Pvt. Ltd., New Delhi.*

*2.Alberto Leon-Gracia and Indra Widjaja,**Communication Networks**, Tata McGraw Hill Education Pvt. Ltd., New Delhi.*

MTETE-104 Adaptive Signal Processing

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit – 1

Adaptive SystemDefinition and Characteristics, Areas of Application, Example of an Adaptive System, Adaptive Linear Combiner, The Performance Function, Gradient and Minimum Mean-Square Error, Alternative Expression of the Gradient, Decorrelation of Error and Input Components.

Unit - 2

Winer Filter Linear Optimum Filtering, Principle of Orthogonality, Minimum Mean Square Error, Winer-Hopf Equation, Error Performance Surface.

Unit - 3

Linear Prediction Forward Linear Prediction, Backward Linear Prediction, Properties of Prediction Error Filters.

Unit - 4

Method of Steepest Descent Basic Idea of Steepest-Descent Algorithm, Steepest-Descent Algorithm Applied to Winer Filter, Stability of Steepest-Descent Algorithm, Limitations of Steepest-Descent Algorithm.

Unit - 5

Least-Mean Square Adaptive Filter Overview, LMS Adaptation Algorithm, Application, Comparison of LMS With Steepest-Descent Algorithm. Normalized Least-Mean Square Adaptive Filter Normalized LMS Filter as the Solution to Constrained Optimization Problem, Stability of the NLMS

Unit – 6

Frequency-Domain and Subband Adaptive Filters Block Adaptive Filters RLS Adaptive Filters Statement of Linear Least-Square Estimation Problem, Matrix Inversion Lemma, The Exponentially Weighted RLS Algorithm. Kalman Filter Recursive Minimum Mean-Square Estimation For Scalar Random Variable, Kalman Filtering Problem, Initial Conditions, Summary of Kalman Filter.

Reference Books:

1.Bernard Widrow and Samuel D. Stearns, Adaptive Signal Processing, Pearson Education.

2.Simon Haykin, Adaptive Filter Theory, 4^{th} Edn. Pearson Education.

MTETE-105 **Satellite Communication System**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

Satellite Communication Technology

Satellite orbits, Satellite constellation and ISL, orbital parameters, look angle determination,launching procedures. Spacecraft subsystems - Attitude and orbit control, power, TT & C, communication and antennas. Earth station design - Digital transmitter and receiver, antenna and beam steering techniques.

Unit-2

Link Design

Digital satellite link analysis and design for FSS and BSS - link budget and Eb/No calculations. Performance impairments - Noise, interference, propagation effects and frequency considerations.

Unit-3

Access Techniques

FDMA concept- Intermodulation and back off - SPADE system. TDMA concept - Frame and burst structure - Frame acquisition and synchronization - Satellite Switched TDMA system. CDMA concepts - DS and FH System acquisition and Tracking. Audio broadcasting via satellite – World Space Services through Teledesic, LEO system and Glob star.

Textbooks:

1. Tri T. Ha, ***Digital Satellite Communication Systems Engineering***, McGraw Hill, 1990.
2. Wilbur L. Pritchard, Henri G. Suyderhoud, and Robert A. Nelson,***Satellite Communication System Engineering***, 2nd Edn., Pearson Education, New delhi.

Reference Books:

1. Pratt and Bostain, ***Satellite Communication***, John Wiley and Sons, 1986.

2. M. Richharia,***Mobile Satellite Communications – Principles and Trends***, PearsonEducation, 2003.

3. Robert.M.Gagliardi, ***Satellite Communication***, CBS Publishers.

MTETE-107 **Mathematics for Communication Engineering**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

Introduction and Foundations:

Markov and hidden Markov Models

Vector Spaces and Linear Algebra:

Metric Spaces.Vector Spaces,Norms and Normed vector Spaces,Inner Products and InnerProduct Spaces, Induced Norms,The Cauchy- Schwarz Inequality,Orthogonal Sub Spaces, Projections and Orthogonal Projection,Projection Theorem Orthogonalization of Vectors.

Representation and Approximation in Vector Spaces:

The Approximation Problem in Hillbert Space, The Orthogonality Principle, Matrix Representation of Least-Squares Problems, Linear Regression, Least Squares Filtering, Minimum Mean Square Estimation, Minimum Mean Squared Error (MMSE) Filtering, Comparison of Least Squares and minimum Mean Squares.

Unit-2

Some Important Matrix Factorization:

The Cholesky Factorization, Unitary Matrices and the QR Factorization.

The Singular Value Decomposition:

Theory of the SVD, Matrix Structure from the SVD, Pseudo-inverses and the SVD, Rank –Reducing Approximations: Effective Rank, System Identification Using the SVD.

Introduction to Detection and Estimation, and Mathematical Notation:

Detection and Estimation Theory, Some Notational Conventions, Conditional Expectation,SufficientStatistics,ExponentiaFamilies.

Unit-3

Detection Theory:

Introduction to hypothesis testing, Neyman-Pearson theory, Neyman Pearson testing with Composite Binary Hypotheses, Bayes Decession Theory, Some M-ary Problems, Maximum–Likelihood Detection.

Estimation Theory:

The Maximum Likelihood principle, ML Esimates and sufficiency, Applications of ML Estimation, Bayes Estimation Theory, Bayes risk

Textbooks:

1. Todd K.Moon and Wynn C. Stirling, ***Mathematical Methods and Algorithms for Signal Processing***, Pearson Education.

Reference Books:

1. Probability and Random Processes with Application to Signal Processing, Pearson Education.

MTETE-106 **Digital Integrated Circuit Design**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

Introduction, Design Metrics and Manufacturing Process:

A Historical Perspective, Issues in Digital Integrated Circuit Design, Quality Metrics of a Digital Design, Introduction to Manufacturing Process, Manufacturing CMOS Integrated Circuits, Design Rules – The Contract between Designer and Process Engineer, Packaging Integrated Circuits

Unit-2

The Devices: Introduction, The Diode, The MOS(FET) Transistor, The Wire, Interconnect Parameters – Capacitance, Resistance, and Inductance, Electrical Wire Models, SPICE Wire Models

Unit-3

The CMOS Inverters and CMOS Logic Gates – the Static View:

Introduction to CMOS Inverter, The Static CMOS Inverter – An Intuitive Perspective, Evaluating the Robustness of the CMOS Inverter, Introduction to Static CMOS Design, Complementary CMOS, Ratioed Logic, Pass-Transistor Logic CMOS Inverter – the Dynamic View:

Performance of CMOS Inverter: The Dynamic Behavior, Power, Energy, and Energy-Delay, Perspective: Technology Scaling and its Impact on the Inverter Metrics

Unit-4

Dynamic CMOS Logic, Timing Metrics: Dynamic CMOS Design, CMOS Logic Design Perspectives, Timing Metrics: Timing Metrics for Sequential Circuits, Classification of Memory Elements

Unit-5

Static and Dynamic Sequential Circuits:

Static Latches and Registers, Dynamic Latches and Registers, Alternative Register Styles: Pulse Registers and Sense-Amplifier Based Registers, Pipelining: An Approach to Optimize Sequential Circuits – Latch Vs Register-Based Pipelines and NORA-CMOS – A Logic Style for Pipelined Structures, Nonbistable Sequential Circuits Coping with Interconnect:

Unit-6

Introduction, Capacitive Parasitics, Resistive Parasitics, Inductive Parasitics, Advanced Interconnect Techniques, Networks-on-a-Chip

Timing Issues in Digital Circuits: Introduction, Timing Classification of Digital Systems, Synchronous Design – An In-depth Perspective, Self-Timed Circuit Design, Synchronisers and Arbiters, Clock Synthesis and Synchronisation Using a Phase-Locked Loop,

Unit-7

Future Directions and Perspectives Designing Arithmetic Building Blocks: Introduction, Data paths in Digital Processor Architecture, The Adder, The Multiplier, The Shifter, Other Arithmetic Operators, Power and Speed Trade-off's in Datapath Structures, Perspective: Design as a Trade-off

Designing Memory and Array Structures:

Unit-8

Introduction, The Memory Core, Memory Peripheral Circuitry, Memory Reliability and Yield, Power Dissipation in Memories, Case Studies in Memory Design: The PLA, A 4-Mbit SRAM and A 1-Gbit NAND Flash memory, Perspective: Semiconductor Memory Trends and Evolution Validation and Test of Manufactured Circuits: Introduction, Test Procedure, Design for Testability, Test Pattern Generation

Textbooks:

1. Jan M. Rabaey, Anantha Chandrakasan, Borivoje Nikolic, Digital Integrated Circuits – A Design Perspective, 2nd edn., Pearson Education, 2003. ISBN: 8178089912.

Reference Books:

1. K. Eshraghian, and N.H.E. Weste, Principles of CMOS VLSI Design – a Systems Perspective, 2nd edn., Addison Wesley, 1993.
2. Wayne Wolf,Modern VLSI Design System–on–Chip Design, 3rd edn,Pearson Ed, 2003.
3. M. Michael Vai, VLSI Design, CRC Press, 2001.
4. John P. Uyemura, CMOS Logic Circuit Design, Springer (Kluwer Academic Pub), 2001.
5. Ken Martin, Digital Integrated Circuit Design, Oxford University Press, 2000.

MTETE-109 **Computational Intelligence**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

Introduction to Soft Computing: Soft computing constituents and conventional Artificial Intelligence, Neuro-Fuzzy and Soft Computing characteristics. Fuzzy Sets, Fuzzy Rules and Fuzzy Reasoning:

Unit-2

Introduction, Basic definitions and terminology, Set-theoretic operations, MF Formulation and parameterization, More on fuzzy union, intersection, and complement, Extension principle and fuzzy relations, Fuzzy If-Then rules, Fuzzy reasoning.

Unit-3

Fuzzy Inference System: Mamdani fuzzy models, Sugeno Fuzzy Models, Tsukamoto fuzzy models, other considerations. Least Square Method for system Identification: System Identification , Basic of matrix manipulations and calculus, Least-square estimator, Geometric interpretation of LSE, Recursive least-square estimator, Recursive LSE for time varying systems, Statistical Properties and maximum likelihood estimator, LSE for nonlinear models.

Unit-4

Derivative-based optimization: Descent methods, the method of steepest descent, Newton's methods, Step size determination, conjugate gradient methods, Analysis of quadratic case, nonlinear least-squares problems, Incorporation of stochastic mechanism.

Unit-5

Derivative-free optimization: Genetic algorithm simulated annealing, random search, Downhill simplex search, Swarm Intelligence, genetic programming.

Adaptive Networks: Architecture, Back propagation for feed forward networks, Extended back propagation for recurrent networks, Hybrid learning rule: combing steepest descent and LSE.

Unit-6

Supervised learning neural networks: Perceptions, Adaline, Back propagation multi layer perceptions, Radial Basic Function networks.

Learning from reinforcement: Failure is the surest path to success, temporal difference learning, the art of dynamic programming, Adaptive heuristic critic, Q-learning, A cost path problem, World modeling, other network configurations, Reinforcement learning by evolutionary computations.

Unit-7

Unsupervised learning and other neural networks: Competitive learning networks, Kohonen self-organizing networks, learning vector quantization, Hebbian learning, principal component networks, and the Hopfield network.

Unit-8

Adaptive Neuro-fuzzy inference systems: ANFIS architecture, Hybrid learning algorithms, Learning methods that cross-fertilize ANFIS and RBNF, ANFIS as universal approximator, Simulation examples, Extensions and advance topics.

Coactive Neuro-fuzzy modeling: towards generalized ANFIS: Framework, Neuro functions for adaptive networks, Neuro-Fuzzy spectrum, Analysis of adaptive learning capability.

Reference Books:

1. J.S.R. Jng, C.T. Sun and E. Mizutani,"Neuro-fuzzy and Soft Computing", PHI.
2. S. Rajasekaran, G.A. Vijaylakshmi Pai,:Neural Networks, Fuzzy Logic, and Genetic Algorithms," PHI.

MTETE-108 **Fibre-Optic Components and Devices**

L	T	P
4	-	-

Exam	:	Marks	Credit
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam :		3hrs.	

Unit-1

Fibre-Optic Light Sources and Detectors Brief description on the principle of optical sources,Internal Quantum efficiency of LED,Modulation capability,Power-Bandwidth product, Laser diodes, Laser diode modes, Threshold conditions, Resonant frequencies, Laser diode structures, Single mode lasers, modulation of laser diodes. Brief description on the principle of optical detectors, photodetector noise, Noise sources, Signal-to-Noise ratio, Detector response time, Depletion layer photocurrent, Response time, Avalanche multiplication noise.

Unit-2

Optical Fibre Connection Joint loss, Multi mode fibre joints, Singe mode fibre joints, Fibre splices, Fusion splices, Mechanical splices, Multiple splices, Fibre connectors, Cylindrical ferrule connectors, Biconical ferrule connectors, Double eccentric connectors, Duplex fibre connectors, Expanded beam connectors, Fibre couplers, Three port couplers, Four port couplers, Star couplers, WDM couplers.

Unit-3

Optical Amplification and Integrated Optics Optical amplifiers, Semiconductor laser amplifiers, Fibre amplifiers, Rare earth doped fibre amplifiers, Raman fibre amplifiers, Brillouin fibre amplifiers, Integrated optics, Integrated optical devices, Beam splitters, Directional couplers, switches, Modulators, Periodic structures for filters and injection

lasers, Opto-electronic integration, Optical bistability and digital optics, Optical computation.

Reference Books:

1. G. Keiser, Optical Fibre Communications, Mc-Graw-Hill.
2. J.M.Senior, Optical Fibre Communications Principles and Practice, PHI.

MTETE-110 **Semiconductor Device Modeling & Simulation**

L	T	P
4	-	-

Exam	:	Marks	Credit
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam :		3hrs.	

Unit-1

Semiconductor Electronics Review:

Elements of Semiconductor Physics, Physical Operation of a PN Junction, MOS Junction, MS Junction PN–Junction Diode and Schottky Diode: DC Current-Voltage Characteristics, Static Model, Large-Signal Model, Small-Signal Model, Schottky Diode and its Implementation in SPICE2, Temperature and Area Effects on the Diode Model Parameters, SPICE3, HSPICE and PSPICE Models

Unit-2

Bipolar Junction Transistor (BJT):

Transistor Convention and Symbols, Ebers-Moll Static Model, Ebers-Moll Large-Signal Model, Ebers-Moll Small-Signal Model, Gummel-Poon Static Model, Gummel-Poon Large-Signal Model, Gummel-Poon Small-Signal Model, Temperature and Area Effects on the BJT Model Parameters, Power BJT Model, SPICE3, HSPICE and PSPICE Models

Unit-3

Junction Field-Effect Transistor (JFET): Static Model, Large-Signal Model and its Implementation in SPICE2, Small-Signal Model and its Implementation in SPICE2, Temperature and Area Effects on the JFET Model Parameters, SPICE3, HSPICE and PSPICE Models

Unit-4

Metal-Oxide-Semiconductor Transistor (MOST): Structure and Operating Regions of the MOST, LEVEL1 Static Model, LEVEL2 Static Model, LEVEL1 and LEVEL2 Large-Signal Model, LEVEL3 Static Model, LEVEL3 Large-Signal Model, The Effect of Series Resistances, Small-Signal Models, The Effect of Temperature, BSIM1, BSIM2, SPICE3, HSPICE and PSPICE Models

Unit-5

BJT Parameter Measurements: Input and Model Parameters, Parameter Measurements MOST Parameter Measurements: LEVEL1 Model Parameters, LEVEL2 Model (Long-Channel) Parameters, LEVEL2 Model (Short-Channel) Parameters, LEVEL3 Model Parameters, Measurements of Capacitance, BSIM Model Parameter Extraction

Unit-6

Noise and Distortions: Noise, Distortion Metal-Semiconductor Field-Effect Transistor (MESFET), Ion-Sensitive Field-Effect Transistor (ISFET) and Semiconductor-Controlled Rectifier (Thyristor): The MESFET, The ISFET, The Thyristor

Text Books:

1. Paolo Antognetti and Giuseppe Massobrio, Semiconductor Device Modeling with SPICE, 2nd edn., McGraw-Hill, New York, 1993, ISBN 0071349553 (paperback) or 007 0024693 (hardback).

Reference Books:

1. Richard S. Muller, Theodore I. Kamins, and Mansun Chan, Device Electronics for Integrated Circuits, 3rd edn., John Wiley and Sons, New York, 2003. ISBN: 0-471-59398-
2. H. Craig Casey, Devices for Integrated Circuits: Silicon and III-V Compound Semiconductors, John Wiley, New York, 1999. Listed as DI
3. Dieter K. Schroder, Semiconductor Material and Device Characterization, John Wiley and Sons, New York, 1990. Listed as S

MTETE-111 **Communication System Engineering Lab**

L	T	P
-	-	3

		Marks	Credit
Exam	:	50	2
Sessional	:	50	2
Total	:	100	4
Duration of Exam :		3hrs.	

LIST OF EXPERIMENTS:

1. Study of Amplitude Modulation and determination of Modulation index.

2. Study of Frequency Modulation and determination of Modulation index.

3. Study of Phase Modulation.

4. Study of Pulse Amplitude Modulation.

5. Study of Pulse Width Modulation.

6. Study of Pulse Frequency Modulation.

7. Study of Pulse Code Modulation.

8. Study of frequency Shift Keying.

9. Study of MSK and QASK.

10. Study of PSK and QPSK.

11. Project related to the scope of the course.

NOTE: Atleast ten experiments are to be performed , atleast seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

MTETE-112 **SEMINAR**

L	T	P			Marks	Credit
-	-	2	Sessional	:	50	2
			Total	:	50	2

Every student will be required to present a seminar talk on a topic approved by the Deptt. exception his/her dissertation. The committee constituted by the Head of the Deptt. will evaluate the presentation and will award one of the grades out of A,A(-),B,B(-),C,C(-), D& F.A Student who is awarded the 'F' grade will be required to repeat the seminar on the same topic.

MTETE-201 **MICROWAVE AND ANTENNA ENGINEERING**

L	T	P	Exam	:	Marks	Credit
4	-	-	Theory	:	100	4
			Sessional	:	50	2
			Total	:	150	6
			Duration of Exam	:	3hrs.	

Unit-1

Overview if microwave transmission line analysis and use smith chart in single and double stub matching. Planar transmission lines (strip line and microstrip line), Microstripline impedance matching, quarter wave impedance transformers for broad band matching and lumped element matching, basics of design and fabrication of MMIC. Scattering matrix representation of multiport networks (T junctions, magic TEE, circulators, directional couplers and isolators).Semiconductor microwave devices (TEDS), negative resistance, Gunn effect, RWH theory LSA mode of operation, Avalanche transit-Time device READ diode, IMPATT,TRAPATT, BARITT diodes – principles of operation only. Solid state microwave generation and amplification (principles).

Unit-2

The vector potential for an electric and magnetic current source, solution of in Homogeneous vector potential wave equation, Duality theorem, reciprocity and reaction theorem. Principles of radiation; radiation pattern, near and far field regions. Antenna efficiency, Radiation power density, radiation intensity, radiation efficiency, Directivity, power gain, bandwidth, beam efficiency, polarization of antennas. Antenna effective length and equivalent areas. Antenna temperature, noise temperature of cascaded networks(using antenna).Dipole and loop antennas; current distribution, radiated field. Radiation resistance, dipole arrays; planar and circular array, array factor and directivity, broadside & end-fire array, phased array, pattern multiplication.

Unit-3

Frequency independent and broad band antennas. Log periodic structure (of dipole antenna).Reflector antenna: corner reflectors, parabolic reflectors, principle of analysis and operation, Aperture antennas (rectangular and circular apertures) TE_{10}, TE_{11}mode and beam efficiency. Directivity and gain. Basic characteristics of micro strip antenna, rectangular and circular patch Q. factor, band width and efficiency; feed to micro strip antenna; probe feed; micro strip line. Micro strip antenna on Ferrite substrate.

TEXT BOOKS:

1. Microwave Devices and Circuits (3^{rd} Ed.), Prentice-Hall of India Pvt. Ltd.
2. Microwave Engineering, TMH.: Annapurna Das, Sisir K. Das.
3. Antennas Theory – Analysis and Design by C. Balanis, 2^{nd} Edition, John Willey and sons.
4. Antennas by J. D. Kraus, Tata Mc-Graw Hill Pubkication.

REFERENCE BOOKS:

1. Microwave Circuits and Passive Devices, M. L. Sisodia, G. D. Raghu Vanshi, Willey Eastern Limited.
2. Electromagnetic Wave and Radiating Systens by E. C. Jordan and K. G. Balmain, 2^{nd} edition, PHI Publication.
3. Antenna & Wave Propagation by K. D. Prasad.
4. Modern Antenna Handbook, John Willey & sons INC Publication.

MTETE-210 **RADAR SYSTEM ENGINERRING**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

The radar equation in terms of the key radar parameters and target-radar cross section. False alarm, minimum detectable signal, Receiver noise and the SNR. Probabilities of detection and False alarm, integration of radar pulses, radar cross section of targets; complex targets, transmitted power, prf, antenna parameters, beam shape, cosecant-squared antenna pattern; basic ideas on system losses MTI and pulse doppler radar, delay line canceller, doppler effect on blind speeds in MTI, staggered prf. doppler filter banks, digital MTI processing, Limitations to MTI performance MTI from a moving platform (AMTI), pulse doppler radar, FM-CW radar for range and velocity determination, SLAR & SAR

Unit-2

Tracking with radar, monopulse tracking, amplitude comparison monopulse, phase-comparison monopulse, conical scan and sequential lobing, Glint (example from a simple target model) tracking in range. Target acquisition, servo system tracking in doppler, track with scan (limited sector scan), Automatic tracking with surveillance Radars.

Unit-3

Functions of the radar antenna, antenna radiation pattern, effective aperture and aperture illumination, side lobe radiation, reflector antennas, grain antenna, Electronically steered phased-array antennas, Beam steering and array-feed networks, change of beam width with steering angle, phase shifters, diode phase shifters, ferrite phase shifters;

Unit-4

Frequency-scan arrays, bandwidth limitation, transmission lines for frequency scan. Radiators and architectures for phased arrays, effect of errors on radiation patens, errors in arrays, adaptive antennas array. General ideas on radar transmitters (RF power sources) and super heterodyne radar receiver, radar displays, scan converter, displexer and receiver protectors.

TEXT BOOK

1 Introduction to Radar system (3rd Edition); Merrill L. Skolnik Tata McGraw Hill publishing Ltd.

REFERENCE BOOKS

1. Ridenour, L. N. Radar System Engineering, MIT radiation laboratory series, Vol. I & II, New York: Mc Graw Hill 1047.
2. Krous, J. D. Antennas, 2nd Edition. Mc Graw Hill, 1988
3. Nathanson, F. E. Radar Design Principle, 2nd Edition, Mc Graw Hill, 1991 (N.Y.)

MTETE-203 **DIGITAL IMAGE PROCESSING**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

Digital Image Fundamentals, Image Transforms: Fourier, Hadamard, Walsh, Discrete cosine and Hotelling Transforms; Image Enhancement: Histogram modification, Histogram equalisation, Smoothing, Filtering, Sharpening, Homomorphic filtering. ; Image restoration,Segmentation: Pixel classification,

Unit-2

Bi-level thresholding, Multi-level thresholding, P-tile method, Adaptive thresholding, Spectral & spatial classification, Edge detection, Hough transform, Region growing. Matching and Registration: Image modeling, Stereo mapping, Landmark matching, Rectification in geometric transformations, Match measurement, Matching of binary pattern,

Unit-3

Distortion tolerant matching; Digital geometry and its applications: Neighborhood, Path, Connectedness, Holes and Surroundness, Borders, Distances, Medial Axis Transform (MAT), Shrinking and Expanding, Thinning. Introduction to Mathematical morphology and its application, Morphological Operations, Dilation, Erosion, Opening, Closing, Smoothing, Extraction of connected components, Thinning.

Text Books:

1. R.C. Gonzalez, R.E. Woods, Digital Image Processing, Pearson Prentice Hall, 2007.
2. B. Chanda, D.D. Majumder, Digital Image Processing and Analysis, Prentice Hall, 2007.

Reference Books:

1. W.K. Pratt, Digital Image Processing (Fourth Edition), John Wiley & Sons, Inc., 2007
2. A.K. Jain, Fundamentals of Digital Image Processing, Prentice Hall, 1988.

MTETE-204 **Wireless Sensor Network**

L	T	P
4	-	-

	Marks	Credit
Exam :		
Theory :	100	4
Sessional :	50	2
Total :	150	6
Duration of Exam :	3hrs.	

Unit-1

Introduction to wireless sensor network: Application and Motivation, Network Performance objective, Development of Wireless Sensor Network; Canonical Problem Localization and Tracking: Tracking Multiple Objects, State space decomposition, Data association, Sensor Models, Performance Comparison and Metrics;

Unit-2

Networking Sensors: The S MAC Protocol,IEEE 802.15.4 Standard and ZigBee , Routing in sensor network; Infrastructure Establishment: Topology Control, Clustering, Time Synchronization, Clocks and Communication Delays, Sensor Tasking and Control;

Unit-3

Sensor Network Databases: Sensor Database Challenges, Querying The Physical Environment, Query Interfaces, Cougar sensor database and abstract data types, Probabilistic queries, High level Database Organization, In Network Aggregation, Query propagation and aggregation, TinyDB query processing, Query processing scheduling and optimization, Data Centric Storage. Special topics in wireless sensor networks.

Text Books:

1. F. Zhao and L. Guibas, Wireless Sensor Network: Information Processing Approach, Elsevier.
2. E. H. Callaway, Jr. E. H. Callaway, Wireless Sensor Networks Architecture and Protocols: CRC Press.

Reference Books:

1. A. Hac, Wireless Sensor Network Designs, John Wiley & Sons

MTETE-205 **Simulation and Modeling**

L	T	P
4	-	-

	Marks	Credit
Exam :		
Theory :	100	4
Sessional :	50	2
Total :	150	6
Duration of Exam :	3hrs.	

Unit-1

Selected illustrative examples of simulation applications. Models: Structural, Process, Continuous, Discrete, Deterministic, Random, input/output, static, dynamic, multilevel.

Unit-2

Simulation: Analog/Digital/Hybrid, verification, validation. Data Modelling and Analysis : Population parameters, hypotheses testing, confidence-intervals, goodness of fit, estimating transient/steady-state characteristics, variance reduction.

Unit-3

Simulation Process : Problem formulating, model building, data acquisition, model translation, verification, validation, strategic and tactical planning, experimentation, analysis of results, implementation and documentation. Simulation Languages: Examples from SIMSCRIPT, GPSS, GASP, SIMULA, etc.

Reference Books:

1. G.Gordon, System Simulation, 2nd ed., Prentice Hall, 1978.
2. Narsing Deo, System Simulation with Digital Computers, Prentice Hall, 1976.
3. J.R. Leigh, Modelling and Simulation, Peter Peregrims Ltd., 1983.
4. A.M.Law, W.D.Kelton, Simulation Modelling and Analysis, Mcgraw Hill, 1982.

MTETE-206 **ASIC and SoC Design**

L	T	P
4	-	-

Exam	:	Marks	Credit
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

Introduction: Voice over IP SOC, Intellectual Property, SOC Design Challenges, Design Methodology. Overview of ASICs: Introduction, Methodology and Design Flow, FPGA to ASIC Conversion, Verification.

Unit-2

SOC Design and Verification: Introduction, Design for Integration, SOC Verification, Set-Top-Box SOC, Set-Top-Box SOC Example. Summary. References. Physical Design: Introduction, Overview of Physical Design Flow, Some Tips and Guidelines for Physical Design, Modern Physical Design Techniques.

Unit-3

Low-Power Design: Introduction, Power Dissipation, Low-Power Design Techniques and Methodologies, Low-Power Design Tools, Tips and Guidelines for Low-Power Design. Low-Power Design Tools: PowerTheater, PowerTheater Analyst, PowerTheater Designer. Open Core Protocol (OCP): Highlights, Capabilities, Advantages, Key Features. Phase-Locked Loops (PLLs): PLL Basics, PLL Ideal Behavior, PLL Errors.

Text Books:

1. Farzad Nekoogar and Faranak Nekoogar, From ASICs to SOCs: A Practical Approach, Pearson Education, 2003, ISBN-10: 0-13-033857-5, ISBN-13: 978-0-13-033857-0

Reference Books:

1. Michael Smith, Application Specific Integrated Circuit, Addison-Wesley, 1997, ISBN: 0201500221

2. Jari Nurmi, Processor Design: System-On-Chip Computing for ASICs and FPGAs, Springer, 1st edition, 2007, ISBN: 1402055293

3. Douglas J. Smith, HDL Chip Design – a practical guide for designing, synthesizing and simulating ASICs and FPGAs using VHDL or Verilog, Doone Publications, 2000, ISBN: 0965193438

MTETE-207 **Internet & Web Technology**

L	T	P
4	-	-

	Marks	Credit
Exam :		
Theory :	100	4
Sessional :	50	2
Total :	150	6
Duration of Exam :	3hrs.	

Unit-1:WebDevelopment
WebPages; Hyper Text Transfer Protocol (HTTP); File Transfer Protocol (FTP) Domain Names; URL; Protocol Address; Website, Web browser, Web Servers; Web Hosting.

HTML/DHTML
Introduction, Objectives, Introduction to Universal Resource Identifier (URI) – Fragment Identifiers and Relative URI's, History of HTML, SGML, Structure of HTML/DHTML Document, Switching between opened Windows and browser (Container tag, Empty tag, Attribute);

Basic Tags of HTML: HTML, HEAD, TITLE, BODY (Setting the Fore color and Background color, Background Image, Background Sound), Heading tag (H1 to H6) and attributes (ALIGN), FONT tag and Attributes (Size: 1 to 7 Levels, BASEFONT, SMALL, BIG, COLOR), P, BR, Comment in HTML (<! >), Formatting Text (B, I, U, EM, BLOCKQUOTE, PREFORMATTED, SUB, SUP, STRIKE), Ordered List- OL (LI, Type- 1, I, A, a; START, VALUE), Unordered List – UL (Bullet Type- Disc, Circle, Square, DL, DT, DD), ADDRESS Tag;

Creating Links: Link to other HTML documents or data objects, Links to other places in the same HTML documents, Links to places in other HTML documents; Anchor Tag <A HREF> and <A NAME>, Inserting Inline Images <IMG ALIGN, SRC, WIDTH, HEIGHT, ALT, Image Link, Horizontal Rules <HR ALIGN, WIDTH, SIZE, NOSHADE>; Web Page Authoring Using HTML

Tables: Creating Tables, Border, TH, TR, TD, CELLSPACING, CELLPADDING, WIDTH, COLSPAN, CAPTION, ALIGN, CENTER;

Frames: Percentage dimensions, Relative dimensions, Frame – Src, Frameborder, height and width, Creating two or more rows Frames <FRAMESET ROWS >, Creating two or more Columns Frames <FRAMESET COLS >, <FRAME NAME SRC MARGINHEIGHT MARGINWIDTH SCROLLING AUTO NORESIZE>, <NOFRAMES>, </NOFRAMES>;

eXtensible Markup Language (XML)

XML:Introduction;
Features of XML: XML can be used with existing protocols, Supports a wide variety of applications, Compatible with SGML, XML documents are reasonably clear to the layperson; Structure of XML: Logical Structure, Physical Structure; **XML Markup:** Element Markup i.e (<foo>Hello</foo>), Attribute Markup i.e.

(<!element.name property=”value”>) ;
Naming Rules: used for elements and attributes, and for all the descriptors, Comments Entity
Declarations :<! ENTITY name “replacement text”>;
Element Declarations: <!ELEMENT name content>;
Empty Elements: <!ELEMENT empty.element EMPTY>;
Unrestricted Elements: <!ELEMENT any.element ANY>;
Element Content Models : Element Sequences i.e. <!ELEMENT counting(first, second, third, fourth)>, Element Choices <!ELEMENT choose(this.one | that.one)>, Combined Sequences and Choices;

Unit 2: Web Scripting

VBScript
Introduction, Adding VBScript code to HTML page, VBScript Data type-Variant subtypes, VBScript Variables: (Declaring variable, Naming restrictions, Assigning value to variables, Scalar variables and 1-D Array), VBScript Constants, VBScript Operators, and Operator precedence;
MsgBox: functions of message box (Prompt, Buttons, Title, Helpline, Context), Return values of MsgBox function, button argument setting.
Conditional statements: If..Then.. Else, Select case;
Loops: Do loops, While.. Wend, For.. Next, For..Each..Next;
VBScript variables: Sub procedures, Function procedures; Using VBScript with HTML form controls, Data handling functions, String functions, Date and Times functions;

Unit 3: Multimedia And Authoring Tools

Graphics Devices: Monitor display configuration, Basics of Graphics Accelerator Card and its importance;
Basic concepts of Images: Digital Images and Digital Image Representation
Image Formats :TIFF, BMP, JPG/JPEG, GIF, PIC. PDF, PSD; Theory of design, form, line, space, texture, color, typography, layout, color harmony, unity, balance, proportion, rhythm, repetition, variety, economy, still life, light and shade, Poster Design; Still life, colored layout, Poster Design, Designing of Books, magazines brochures, children’s literature, narrative text handling, scripts in Indian Languages, picture books, comics, illustrations with photographs, scientific illustrations, conceptual illustrations, handling of assignment for the market; Image Scanning with the help of scanner: Setting up Resolution, Size, File formats of images; image preview, Bitonal, Grey Scale and color options; Significance of PDF- creation, modification; Animation, Morphing and Applications

Graphic Tools: Image Editing Software (Photoshop / Coreldraw)
Basic Concepts: An Introduction, creating, Opening and saving files, Menus, Toolbox, Color control icons, Mode control icons, Window controls icons; creating new images, Image capture (TWAIN) from scanner other files;
Image Handling: Cropping an image, adjusting image size, increasing the size of the work canvas, saving an image;
Layers: Adding layers, dragging and pasting selections on to layers, dragging layers between files, viewing and hiding layers, Editing layers, rotating selections, scaling

an object, preserving layers transparency, moving and copying layers, duplicating layers, deleting layers, merging layers, using adjustment layers;

Channels and Masks: Channel palette, showing and hiding channels, splitting channels in to separate image, merging channels, creating a quick mask, editing masks using quick mask mode;

Concept of Multimedia: Picture/Graphics, Audio, Video;

Sound: Recording Sound using Sound Recorder (Capture), Sound capture through sound editing software (ex: Sound forge), Sound editing, Noise correction, Effect enhancement ; Voice Recognition Software Philips/Dragon, MIDI Player, Sound Recorder, MONO & Stereo. Sound
File Format: AIFF (Audio Input File Format from Apple Mac) , MIDI, WAV, MP3, ASF (Streaming format from Microsoft).
Importing audio and saving audio from Audio CD.
Sound Quality: CD Quality, Radio Quality, Telephone Quality;

MTETE-208 DESIGN & SIMULATION LAB

L	T	P		Marks	Credit
			Exam :	50	2
-	-	3	Sessional :	50	2
			Total :	100	4

LIST OF EXPERIMENTS:

1. Simulate and study half-wave, full-wave, and bridge-rectifier using PSPICE windows
2. Simulate and study diode clipper and clamper circuits using PSPICE windows
3. Simulate and study emitter bias and fixed bias BJT and JFET circuits using PSPICE windows, and determine quiescent conditions.
4. Simulate a common emitter amplifier using self biasing and study the effect of variation in emitter resistor on voltage gain , input and output impedance using PSPICE windows .
5. Determine the frequency response of Vo/Vs for CE BJT amplifier using PSPICE windows. Study the effect of cascading of two stages on band width.
6. Simulate and study Darlington pair amplifier circuit using PSPICE windows and determine dc bias and output ac voltage .
7. Study an operational amplifier using PSPICE windows and find out: CMMR, gain band width product, slew rate, 3-db frequency, and input offset voltage.
8. Simulate and study active low pass, high pass, and band pass filters using PSPICE windows.
9. Simulate and study class A, B, C, and AB amplifier using PSPICE windows.
10. Study the operation of 555 timer oscillator using PSPICE.
11. Simulate logic expression……..and determine its truth table.
12. Simulate logic expression of full adder circuit and determine its truth table.
13. Simulate a synchronous 4-bit counter and determine its count sequence.
14. Simulate a master-slave flip-flop using NAND gates and study its operation. Study the operation of asynchronous preset and clear .

NOTE : At least ten experiments have to be performed in the semester; out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution.

MTETE-209 **SEMINAR ON PRE-THESIS WORK-2**

L	T	P			Marks	Credit
-	-	3	Sessional	:	50	2
			Total	:	50	2

Every student will be required to present a seminar talk on a topic approved by the Deptt. exception his/her dissertation. The committee constituted by the Head of the Deptt. will evaluate the presentation and will award one of the grades out of A,A(-),B,B(-),C,C(-), D& F.A Student who is awarded the 'F' grade will be required to repeat the seminar on the same topic.

MTETE-301 **PROJECT MANAGEMENT**

L	T	P
4	-	-

Exam	:	Marks	Credit
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

PROJECT MANAGEMENT

Introduction, Computer Aided Project management, Computer Tools & software, Project Definition Structure, Work break
down structure, Project functional organization, Project Budget and Cost control system, Project Planning and schedule
control system using CPM and PERT networks, case studies.

Reference Books:

1. Project Management K . Nagarajan New AGE International
2. Guide to the Project Management Body of Knowledge Project Management Institute Project Management Inst
3. Project Management Greer Michael JAICO PUBL
4. Successful Project Management Trevor Young viva

MTETE-302 **RESEARCH METHODOLOGY**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

Unit-1

Research Process and Theoretical Approaches
Nature And Significance of Research Problems – The Literature Review – Data Analyses Strategies – Research Design and Methods
Positivism and Realism – Evolution of scientific inquiry, Induction and Deduction Debate; Verification versus falsification; Paradigms – Nature of Scientific Revolution.
Contemporary Theoretical Trends – Structuration Theory; Feminist Theories, Post-colonial Thinkers; Materialist Feminism and the Politics of Discourse.

Unit-2

Introductory Statistical Methods

Statistical Methods is a course in applied statistics that will investigate concepts and methods in descriptive and inferential statistics. F-distribution, confidence intervals, hypotheses testing, and correlation.Survey Research

Unit-3

Use of Computer in Research

Introduction to Computer Fundamentals, hardware, Software. Working with MS-Dos, LAN (Novell Netware) environment, Windows Operating System.
DBMS: Data Base Management Systems; Data Base Operations like Creation, Updation, Indexing/Sorting and Searching of Data, Report and Label Generations, Programme Writing. MS-Office: MS Word, Excel, Powerpoint.
Spreadsheet: Introduction to Spread sheet applications, Data Entries, Statistical, Logical and Financial Functions, Graphical Applications and Data Analysis. Advanced Statistical Methods,Qualitative Research

Unit-4

Data Analysis with Statistical Packages

Analysis Design: Quantitative data analysis. Research and use of statistical packages for quantitative research data analysis. Introduction to statistical packages in Social Sciences Research. Data preparation using various packages/editors, Data Definition, Transformation and System files generation.
Statistical Analysis: Frequency, Cross tabulation, Descriptive Statistics, T-test, Means, Correlations, Analysis of Variance, Regression, Non-parametric test, Tables and Reports, Factor, Cluster and Discriminant Analysis.

MTETE-303 **OPTIMIZATION TECHNIQES**

L	T	P
4	-	-

		Marks	Credit
Exam	:		
Theory	:	100	4
Sessional	:	50	2
Total	:	150	6
Duration of Exam	:	3hrs.	

UNITI

Introduction to linear Programming: The linear Programming model, Assumption of Linear Programming, Additional Examples,

Solving LPPs: The simplex method, the essentials of simplex method, Setting up the simple method, The Algebra of the simplex method, The simplex method in Tabular form. Tie Breaking in simplex method, Adopting to the other model forms.

UNITII

Duality theory: Primel Dual Relationships, Other Algorithm for linear programming, The dual simplex method,

The Transportation & Assignment Problems: The transportation Problems, A streamlined

simplex method for the transportation problems, The Assignment Problem.

UNITIII

Network optimization Models, The shortest path Problem, the minimum spanning tree problem, the maximum flow problem, the minimum cost flow problem,, The Project Management with PERT/CPM, Scheduling a problem with PERT/CPM, Dealing with uncertain activity durations, considering Time cost TradeOffs,

Scheduling and

Controlling, Projects costs, An evaluation of PERT/CPM.

UNITIV

Game Theory: The formation of Twoperson,

Zerosum

games, Solving simple games, games

with mixed strategies, Graphical solution Procedure, Solving by LP.

Inventory Theory: Components of inventory models, Deterministic continuous review models, A

deterministic periodic review model, A stochastic continuous review model.

Text Book:

Hiller and Lieberman, Introduction to Operation Research (Seventh Edition) Tata McGrawHill Publishing Company Ltd

Reference Books:

1) Ravindren Philips and Solberg, Operation Research Principles and Practice(Second Edition) John Wiley & Sons.

MTETE-304 **DISSERTATION (PHASE-I)**

L	T	P			Marks	Credit
-	-	4	Sessional	:	100	4
			Total	:	100	4

Every student will carry out dissertation under the supervision of a Supervisor(s). The topic shall be approved by a Committee constituted by the Head of the concerned Deptt. Every student will be required to present two seminar talks, first at the beginning of the Dissertation(Phase-I) to present the scope of the work and to finalize the topic, and second towards the end of the semester, presenting the work carried out by him/her in the semester. The committee constituted will screen both the presentations so as to award the sessional grades out of A, A(-), B, B(-), C, C(-), D & F.A student scoring 'F' grade shall have to improve this grade before continuing his/her Dissertation in the4th semester failing which he/she shall have to repeat the Dissertation (Phase-I) next time in the regular
3rd semester.

MTETE-306 **SEMINAR**

L	T	P
-	-	2

		Marks	Credit
Exam	:		
Sessional	:	50	2
Total	:	50	2

Every student will be required to present a seminar talk on a topic approved by the Deptt. excepton his/her dissertation. The committee constituted by the Head of the Deptt. will evaluate the presentation and will award one of the grades out of A,A(-),B,B(-),C,C(-), D& F.

A Student who is awarded the 'F' grade will be required to repeat the seminar on the same topic.

MTETE-401 **DISSERTATION**

L	T	P			Marks	Credit
-	-	4	Exam	:	600	4
			Sessional	:	150	4
			Total	:	750	8

The Dissertation Phase-1 will be continued as dissertation in 4th Semester.
The award of sessional grades out of A, A (-), B, B(-),C, C(-), D & F will be done by an internal Committee constituted by the Head of the Deptt. This assessment shall be based on presentation (s), report, etc. before this committee. In case a student scores 'F' –grade in the sessional, failing which he/ she will not be allowed to submit the dissertation. At the end of the semester, every student will be required to submit three bound copies of his/her Master's dissertation of the office of the concerned epartment. Out of these, one copy will be kept for department record & one copy shall be for the supervisor. A copy of the dissertation will be sent to the external examiner by mail by the concerned department, after his/her appointment and intimation from the university. Dissertation will be evaluated by a committee of examiners consisting of the Head of the Department, dissertation supervisor(s) and one external examiner. There shall be no requirement of a separate evaluation report on the Master Dissertation from the external examiner. The external examiner shall be appointed by the University from a panel of examiners submitted by the respective Head of Deptt., to the Chairman, Board of Studies. In case the external examiner so appointed by the University does not turn up, the Director/ Principal of the concerned college, on the recommendation of the concerned Head of the Deptt. Shall be authorized, on behalf of the University., to appointed an external examiner from some other institution.
The student will defend his/her dissertation through presentation before this ommittee and the committee will award one of the grades out of A, A(-), B, B(-), C, C(-), D & F. A Student scoring 'F' grade in the exam shall have to resubmit his/her Dissertation after making all correction / improvements and this dissertation shall be evaluated as above.
Note: The Scheme of awarding the Grades to the student in the course will be supplied by the University
to the examiner(s).