School of Engineering

Sri Satya Sai University of Technology and Medical Sciences, Sehore

Curriculum for

Postgraduate Degree Courses in Engineering & Technology

Master of Technology (Electronics and communication Engineering)

Specialization: Digital communication

1) **Vision :** To achieve academic excellence in Electronics Engineering for advance masters by imparting in depth knowledge to the students, facilitating research activities and cater to the ever changing industrial demands, global and societal needs.

2) Mission :

1. To impart quality engineering education in DIGITAL COMMUNICATION & VLSI Field.
2. To provide technical expertise along with professional ethics as per societal needs.
3. To provide a creative environment through structured teaching - learning process.
4. To achieve academic excellence.
5. To strive towards efficient industry-institute interaction.
6. To serve the needs of the society through R&D activities.
7. To inculcate self learning attitude , entrepreneurial skills and professional ethics.

3)Program Educational Objectives (PEO's)

PEO-1 To postgraduate in Digital Communication with expert and professionals in the present generation of communication techniques.

PEO-2 To develop the capability of independent research project in Digital Communication applying research principles and methods.

PEO-3 To train the postgraduate in Digital Communication with the depth knowledge of various subject of present day interest like Advanced Digital, Satellite & mobile Communication, Modern DSP and signal theory.

4)Program Outcomes (PO's):

PO-1 Engineering knowledge: Acquire successful careers in core, allied industry and teaching in national & international institutes to deliver technical knowledge.

PO-2 Problem Analysis; Apply knowledge of mathematics, science and engineering in solving the problems related to digital communication and conduct experiments as well as analyze and interpret data.

PO-3 Design/development of solutions: .Design and implement an independent research project in Digital Communication applying research principles and methods.

PO-4 Conduct investigations of complex problems: Compiling and interpreting research data and presenting them in an appropriate format, taking into consideration scientific principles and methodology, as well as practical applicability.

PO-5 Modern tool usage: Acquire skills in handling instruments, tools, techniques and modeling using advanced software & tools.

PO-6 The engineer and society: Apply knowledge & creativity to identify, formulate and solve engineering problems.

PO-7 Environment and sustainability: Handle the different communication system problems, related channel coding techniques, modulation techniques, spread spectrum & equalization techniques, DSP, Antenna Design, and a number of telecommunication problems.

PO-8 Ethics: Analysis of complex situations and problems, Identifying alternative solutions and Successful implementation of problem-solving strategies and make the ethical principles for industry .

PO-9 Individual and team work: Empowers the candidate with confidence and leadership qualities such as ability to communicate effectively, ability to engage in life-long learning and an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice and environmental and Society context.

PO-10 Communication: A balanced understanding of software and hardware to support product design and development related to digital communication engineering.

PO-11 Project management and finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

PO-12 Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

5) <u>Programme Specific Outcomes (PSO's):</u>

PSO-1 Apply the knowledge of electronics and communication to solve complex engineering problems in Electronic Devices and Circuits, VLSI, Embedded systems, Analog & Digital communication and other associated topics.

PSO-2 Select and apply modern engineering hardware and software tools to analyze complex Electronics and Communication engineering problems.

6) PEO/PO Mapping

PEO	PROGRAMME OUTCOMES											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
I	√	√	√	√	√	√	√	√	√	√	√	√
II			√	√			√			√	√	
III				√	√	√			√			
IV					√		√		√		√	√
V				√						√	√	√

7)Programme PO's and PSO's Mapping

S.NO	Semester	Name of the Courses/POs(Basic, Core Electives, Projects, Internships etc.)	PO 1 Engineering Knowledge	PO2 Problem Analysis	PO3 Design/Development of Solution	PO4 Investigation	PO5 Modern Tool Usage	PO6 The Engineer and Society	PO7 Environment and Sustainability	PO8 Ethics	PO9 Individual and Team Work	PO10 Communication	PO11 Project Management	PO12 Life-Long Learning	PSO1	PSO2
1	Semester-Ist	Advanced Mathematics	*	*	*	*								*		
		Digital Communication	*	*		*								*		
		VLSI Technology & Design	*	*	*	*	*			*		*		*		
		Advanced Digital Signal Processing	*	*	*	*	*								*	
		Information Theory & Coding	*	*	*				*						*	
		Lab -1 : Digital Communication	*	*	*	*	*			*	*	*		*	*	*
		Lab -2 : Digital Signal Processin	*	*	*	*	*			*	*		*	*		

		g													
2	Semester-IInd	Advanced Optical Communication	*	*	*	*								*	*	
		Wireless Communications and Networks	*	*	*	*			*	*					*	
		Advanced Data Communications	*	*	*	*			*					*	*	
		Telecommunication Switching & Networks	*	*	*	*										*
		Cellular And Mobile Communications	*	*	*	*	*		*	*			*			
		Lab -1 : Modeling & Simulation Lab	*	*	*	*	*								*	
		Lab -2 : Simulation in MATLAB Environment	*	*	*	*	*								*	*
3	Semester-IIIrd	(A) Wireless LAN	*	*	*	*	*								*	*
		(B) Soft Computing Techniques	*	*	*	*	*								*	*
		Network Design Technolo	*	*	*	*	*		*							

		gy													
		(B) Micro Controller System Design	*	*	*	*	*								*	*
		Seminar			*		*	*	*	*		*	*	*		
		Dissertation Part I	*	*	*	*			*		*					
4	Semester-IV	Dissertation Part-II	*	*	*	*	*	*	*		*			*	*	*

8)Structure of Program.

To fulfill the need of development of all the POs/ GAs, as per above mapping, the following semester wise program structure are as under.

[L= Lecture, T = Tutorials, P = Practical's & C = Credits]

Total Credits*= 104

Structure of Post Graduate Engineering program:

S. No.	Course Category	Credits of the DC Curriculum
1.	Program Core Corse	64
2.	Program Elective Course	08
4.	Project	32
5.	Audit Course	Nil
	Total	**104**

Definition of Credit:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
1 Hr. Practical (P) per week	0.5 Credit
2 Hours Practical (Lab)/week	1 Credit

(09) Scheme of Exanimation (Digital Communication) Academic Year 2019-20

Scheme of Examination

First Semester –Master of Technology (Digital Communication)

SEMESTER-I

S.No.	Subject Code	Subject Name	Periods per week			Credits	Maximum marks (Theory Slot)			Maximum Marks (Practical Slot)		Total Marks
			L	T	P		End Sem. Exam.	Tests (Two)	Assignments/ Quiz	End Sem. Practical / Viva	Practical Record/ assignment/Quiz/Presentation	
1.	MEDC-101	Advanced Mathematics	3	1	-	4	70	20	10	-	-	100
2.	MEDC-102	Digital Communication	3	1	-	4	70	20	10	-	-	100
3.	MEDC-103	VLSI Technology & Design	3	1	-	4	70	20	10	-	-	100
4.	MEDC-104	Advanced Digital Signal Processing	3	1	-	4	70	20	10	-	-	100
5.	MEDC-105	Information Theory & Coding	3	1	-	4	70	20	10	-	-	100
6.	MEDC-106	Lab -1 : Digital Communication	-	-	6	6	-	-	-	90	60	150
7.	MEDC-107	Lab -2 : Digital Signal Processing	-	-	6	6	-	-	-	90	60	150
		Total	15	5	12	32	350	100	50	180	120	800

SEMESTER-II

Scheme of Examination

Second- Semester –Master of Technology (Digital Communication)

S.No.	Subject Code	Subject Name	Periods /week			Total Credits	Maximum Marks Allotted					Total Marks
							Theory Slot			Practical Slot		
			L	T	P		End Sem. Exam.	Tests (Two)	Assignments/ Quiz	End Sem. Practical / Viva	Practical Record/ assignment/ Quiz/ Presentation	
1.	MEDC-201	Advanced Optical Communication	3	1	-	4	70	20	10	-	-	100
2.	MEDC-202	Wireless Communications and Networks	3	1	-	4	70	20	10	-	-	100
3.	MEDC-203	Advanced Data Communications	3	1	-	4	70	20	10	-	-	100
4.	MEDC-204	Telecommunication Switching & Networks	3	1	-	4	70	20	10	-	-	100
5.	MEDC-205	Cellular And Mobile Communications	3	1	-	4	70	20	10	-	-	100
6.	MEDC-206	Lab -1 : Modeling & Simulation Lab	-	-	6	6	-	-	-	90	60	150
7.	MEDC-207	Lab -2 : Simulation in MATLAB Environment	-	-	6	6	-	-	-	90	60	150
		Total	15	5	12	32	350	100	50	180	120	800

Scheme of Examination

Third-Semester –Master of Technology (Digital Communication)

SEMESTER-III

S.No.	Subject Code	Subject Name	Periods per week			Credits	Maximum marks (Theory Slot)			Maximum Marks (Practical Slot)		Total Marks
			L	T	P		End Sem. Exam.	Tests (Two)	Assignments/ Quiz	End Sem. Practical / Viva	Practical Record/ assignment/Quiz/ Presentation	
1.	MEDC-301	Elective 1	3	1	-	4	70	20	10	-	-	100
2.	MEDC-302	Elective 2	3	1	-	4	70	20	10	-	-	100
3.	MEDC-303	Seminar			4	4				-	100	100
4.	MEDC-404	Dissertation Part I			8	8				120	80	200
		Total	6	2	12	20	140	40	20	120	180	500

Elective 1	(A) Wireless LAN	B) Soft Computing Techniques
Elective 2	(A) Network Design Technology	(B) Micro Controller System Design

Scheme of Examination

Fourth- Semester –Master of Technology (Digital Communication)

SEMESTER-IV

S.No.	Sub Code	Subject Name	Periods per			Credits	Max Marks Theory			Max. Marks Practical		Total Marks
			L	T	P		End Sem Exam	Mid Sem	TW	End Sem Practical / Viva	Practical Record/ Quiz /Assignment / Presentation	
1.	MEDC- 401	Dissertation Part- II	-	-	20	20	-	-	-	300	200	500
TOTAL			-	-	20	20	-	-	-	300	200	500

Advanced Mathematics

MEDC- 101

MEDC-101	Advanced Mathematics	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To learn principles of advanced engineering mathematics through linear algebra and calculus of variations.
2. To understand probability theory and random process that serve as an essential tool for applications of electronics and communication engineering sciences.

Course Outcomes:

1. Understand vector spaces, basis, linear transformations and the process of obtaining matrix of linear transformations arising in magnification and rotation of images.
2. Apply the technique of singular value decomposition for data compression, least square approximation in solving inconsistent linear systems.
3. Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits.

UNIT 1: (10-HOURS)

Partial Differential Equation Solution of Partial Differential Equation (PDE) by separation of variable method, Numerical solution of PDE (Laplace, Poisson's, Parabola) using finite difference Methods.

UNIT 1I: (10-HOURS)

Matrices And Linear System Of Equations Solution of linear simultaneous equations by Gaussian elimination and its modification, Crout's triangularization method, Iterative methods-Jacobins method, Gauss-Seidal method, Determination of Eigen values by iteration.

UNIT 1II: (10-HOURS)

Calculus Of Variations Euler-Lagrange's differential equation, The Brachistochrone problems and other applications. Isoperimetric problem, Hamilton's Principle and Lagrange's Equation, Rayleigh-Ritz method, Galerkin method.

UNIT 1V: (06-HOURS)

Fuzzy Logic Operations of fuzzy sets, fuzzy arithmetic & relations, fuzzy relation equations, fuzzy logics. MATLAB introduction, programming in MATLAB scripts, functions and their application.

UNIT V: (06-HOURS)

Reliability Introduction and definition of reliability, derivation of reliability functions, Failure rate, Hazard rate, mean time t future & their relations, concepts of fault tolerant analysis.

Reference Books:

1. Higher Engineering Mathematics - by Dr. B.S. Grewal; Khanna Publishers

2. Calculus of Variations - by Elsgole; Addison Wesley.

3. Applied Numerical Methods with MATLAB by Steven C Chapra, TMH.

4. Introductory Methods of Numerical Analysis by S.S. Shastry,

5. Calculus of Variations - by Galfand & Fomin; Prentice Hall.

6. Higher Engineering Mathematics by B.V. Ramana, Tata Mc Hill.

7. Advance Engineering Mathematics by Ervin Kreszig, Wiley Easten Edd.

8. Numerical Solution of Differential Equation by M. K. Jain

9. Numerical Mathematical Analysis By James B. Scarborogh

10. Fuzzy Logic in Engineering by T. J. Ross

11. Fuzzy Sets Theory & its Applications by H. J. Zimmersoms

Digital Communication

MEDC-102

MEDC-102	Digital Communication	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble

1. Understand and appreciate the need of various modulation and spread spectrum techniques.
2. Analyze the properties of basic Modulation techniques and apply them to Digital Communication
3. Apply different types of coding techniques to design the optimum receiver for channels with ISI and AWGN.
4. Design and develop the different types of modulation techniques, equalizer to improve the performance under fading channels for various applications.

Course Outcomes:

1. Explain merits and demerits of different modulation techniques & coding techniques, spread spectrum signals and channel behaviors
2. Analyze various modulation, equalization, diversity and coding techniques for communication systems
3. Compare performance of different types of modulation on different wireless application fading channels.
4. Design and demonstrate various modulation/coding equalization techniques and measure their performance

UNIT 1: (10-HOURS)

Digital PAM, binary PAM formats, line coding, band limited digital PAM systems, Nyquist pulse shaping, equalization, synchronization techniques, bit and frame synchronization. Coded pulse modulation, voice digitization rate (VDR) of PCM, DPCM, DM, ADM, CVSD, log PCM, their performance comparison, VDR reduction by speech coding, VOCODERS, noise performance of PCM and DM, Digital multiplexes. AT & T and CCITT hierarchies, quasi-synchronous multiplexes.

UNIT 2: (10-HOURS)

Digital CW modulation, BPSK, DPSK, DEPSK, QPSK, Mâ□™ary PSK, QASK, BFSK, Doubinary encoding, QPR coherent and non-coherent systems, error probabilities in PSK, DPSK, FSK, QPSK, 16 QAM, MSK, QPR and bit.

UNIT 3: (10-HOURS)

Matched correlation and optimum filters and symbol error rate.

UNIT 4: (06-HOURS)

Spread Spectrum techniques: DS, CDMA, FH, PN sequence, Power requirement, PN- sequence code, and Walshâ□™s code.

UNIT 5: (06-HOURS)

ISDN & Value added communication system simulation & Analysis using MATLAB & Simulink

Application using communication toolboxes. Books :

1. Digital Communication. By Haykins Mc Graw Hill Int Edition.

2. Modern Digital & Analog Communication . By B P Lathi,. Willey Eatern Ltd. 2000.

3. Communication. Systems by A B Carlson, Tata Mc Graw Hill, 2000.

VLSI Technology & Design

MEDC-103

MEDC-103	VLSI Technology & Design	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To learn the basic MOS Circuits ·
2. To learn the MOS Process Technology ·
3. To understand the operation of MOS devices. ·
4. To impart in-depth knowledge about analog and digital CMOS circuits

Course Outcomes:

1. Understand the fabrication process of IC technology
2. Analysis of the operation of MOS transistor
3. Analysis of the physical design process of VLSI design flow
4. ·Analysis of the design rules and layout diagram

UNIT – I: (10-HOURS)
Review of Microelectronics and Introduction to MOS Technologies: MOS, CMOS, BiCMOS Technology, Trends And Projections. Basic Electrical Properties of MOS, CMOS & BiCMOS Circuits: Ids-Vds relationships, Threshold Voltage Vt , Gm, Gds and ωo, Pass Transistor, MOS, CMOS & Bi CMOS Inverters, Zpu/Zpd, MOS Transistor circuit model, Latch-up in CMOS circuits.

UNIT – II: (10-HOURS)

Layout Design And Tools: Transistor structures, Wires and Vias, Scalable Design rules, Layout Design tools. Logic Gates & Layouts: Static Complementary Gates, Switch Logic, Alternative Gate circuits, Low power gates, Resistive and Inductive interconnect delays.

UNIT – III: (10-HOURS)

Combinational Logic Networks: Layouts, Simulation, Network delay, Interconnect design, Power optimization, Switch logic networks, Gate and Network testing.

UNIT –IV: (06-HOURS)

Sequential Systems: Memory cells and Arrays, Clocking disciplines, Design, Power optimization, Design validation and testing.

UNIT – V: (06-HOURS)

Floor Planning & Architecture Design: Floor planning methods, off-chip connections, High-level synthesis, Architecture for low power, SOCs and Embedded CPUs, Architecture testing.

References:

1. Essentials of VLSI Circuits and Systems, K. Eshraghian Eshraghian. D, A.Pucknell, 2005, PHI.
2. Modern VLSI Design - Wayne Wolf, 3rd ed., 1997, Pearson Education.
3. Principals of CMOS VLSI Design – N.H.E Weste, K.Eshraghian, 2nd ed., Adisson Wesley

Advanced Digital Signal Processing
MEDC-104

MEDC-104	Advanced Digital Signal Processing	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. Understand the design of various types of digital filters and implement them using various implementation structures and study the advantages & disadvantages of a variety of design procedures and implementation structures.
2. understand the concept and need for Multirate signal Processing and their applications in various fields of Communication & Signal Processing
3. understand difference between estimation & Computation of Power spectrum and the need for Power Spectrum estimation

Course Outcomes:

1. Design and implement a filter which is optimum for the given specifications.
2. Design a Mutirate system for the needed sampling rate and can implement the same using Poly phase filter structures of the needed order.
3. Estimate the power spectrum of signal corrupted by noise through a choice of estimation methods: Parametric or Non Parametric.

UNIT 1 : (10-HOURS)
Discrete Time signals - sequences, representation Discrete Time Systems Linear, Time invariant, LTI System, properties, constant coefficient difference equation. Frequency Domain Representation of discrete time signals & systems

UNIT II : (10-HOURS)

Discrete Time Random Signals Z Transform properties, R.O.C, stability, Causality criterion,Inverse Z-Transform , Recursive and Non recursive systems, Realization of discrete time system.

UNIT III : (10-HOURS)

D.F.T â□“ properties, linear and circular convolution Discrete Cosine transform, relationship between DFT & DCT, I.D.F.T , computation of D.F.T : F.F.T â□“ Decimation in time & Decimation in frequency.

UNIT IV : (06-HOURS)
F.I.R and I.I.R Systems : Basic structure of FIR & IIR, Bilinear transformation, Design of discrete time I.I.R filters â□“ Butterworth, Chebychev, Inv. Chebychev, elliptic etc. Design of F.I.R filters by windowing â□“ rectangular,Bartlett, Hann, Hamming, Kaiser window filter , Design method ,

Relationship of Kaiser to other windows. Application of MATLAB for design of digital filters Effect of finite register length in filter design.

UNIT V: (06-HOURS)

Advanced signal processing techniques and transforms: Multirate Signal processing Down sampling/upsampling, Int. to discrete Hilbert transform, wavelet transform, Haar transform etc. Application of DSP to Speech Signal Processing.

References :

1. A.V Opprenheim and R.W Schaffer, â□œDiscrete â□“ Time signal processingâ□□ (2ndedition) , Prentice Hall
2. S. Mittra Digital Signal Processing using MATLAB, 2nd Edition.
3. Proakis, Int. to Digital Signal Processing, Maxwell Mcmillan.

Information Theory & Coding
MEDC-105

MEDC-105	Information Theory & Coding	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To develop to understand the concept of information theory and data compression.

Course outcomes :

1. At the end of the course the students will have knowledge of entropy, relative entropy and mutual information.

UNIT I: (10 hours)
Information Theory Information – Entropy, Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding - Joint and conditional entropies, Mutual information - Discrete memoryless channels – BSC, BEC – Channel capacity, Shannon limit.

UNIT-II : (10 hours)
Error Control Coding: Block Codes Definitions and Principles: Hamming weight, Hamming distance, Minimum distance decoding - Single parity codes, Hamming codes, Repetition codes - Linear block codes, Cyclic codes - Syndrome calculation, Encoder and decoder - CRC

UNIT-III: (10 hours)
Error Control Coding: Convolutional Codes Convolutional codes – code tree, trellis, state diagram - Encoding – Decoding: Sequential search and Viterbi algorithm – Principle of Turbo coding

UNIT-IV: (6 hours)
Source Coding: Text, Audio And Speech Text: Adaptive Huffman Coding, Arithmetic Coding, LZW algorithm – Audio: Perceptual coding, Masking techniques, Psychoacoustic model, MEG Audio layers I,II,III, Dolby AC3 - Speech: Channel Vocoder, Linear Predictive Coding

UNIT-V (6 hours)
Source Coding: Image and Video Image and Video Formats – GIF, TIFF, SIF, CIF, QCIF – Image compression: READ, JPEG – Video Compression: Principles-I,B,P frames, Motion estimation, Motion compensation, H.261, MPEG standard

Text Books:

1.R Bose, “Information Theory, Coding and Cryptography”, TMH 2007
2.Fred Halsall, “Multidedia Communications: Applications, Networks, Protocols and Standards”, Perason Education Asia, 2002
3.K Sayood, “Introduction to Data Compression” 3/e, Elsevier 2006
4.S Gravano, “Introduction to Error Control Codes”, Oxford University Press 2007
5.Amitabha Bhattacharya, “Digital Communication”, TMH 2006

MEDC-106
Lab -1: Digital Communication

MEDC-106	Lab-1 Digital Communication	0L:0T:6P	6 credits	6Hrs/Week

List of Experiments

1. Design and Generation of random binary signals.
2. Study of impairments of signals generated in experiment 1 on passing through a simulated channel by observing Eye Pattern.
3. Generation Unipolar NRZ, Polar NRZ, Unipolar RZ and Polar RZ line codes.
4. Generation Manchester and AMI line codes.
5. Conversion of analogue signal into PCM format and its study.
6. Design and implementation of Delta Modulator for analogue signals.
7. Design, implementation and study of BASK Modulator and demodulator.
8. Design, implementation and study of BPSK Modulator and demodulator.
9. Design, implementation and study of BFSK Modulator and demodulator.
10. Design, implementation and study of multiplexer and de-multiplexer of digital signals using TDM

MEDC-107

Lab -2 : Digital Signal Processing

MEDC-107	**Lab-2 Digital Signal Processing**	**0L:0T:6P**	**6credits**	**6Hrs/Week**

LIST OF PRACTICALS

1. Study of MATLAB 7.0.
2. Program to generate different kind of signals .
3. Write a program to find output for linear convolution using MAT LAB.
4. MATLAB program for generating the signal and sequences .
5. Program for determine the Discrete Fourier Transform.
6. Program for determine the inverse Discrete Fourier Transform.
7. Program for determination of auto correlation
8. Program for determination of cross correlation.
9. Filter design using Elliptical method.

MEDC-201 Advanced Optical Communication

MEDC-201	Advanced Optical Communication	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To learn the basic elements of optical fiber transmission link, fiber modes configurations and structures.
2. To understand the different kind of losses, signal distortion in optical wave guides and other signal degradation factors.
3. To get familiar with the various optical source materials, LED structures, quantum efficiency, Laser diodes

Course Outcomes:

1. Students will be able to recognize and classify the structures of Optical fiber and types.
2. Students will be able to discuss the channel impairments like losses and dispersion.
3. Students will be able to analyze various coupling losses.
4. Students will be able to classify the Optical sources and detectors and to discuss their principle.

Unit 1 : Introduction To Optical Communication And Fiber Characteristics (10hours)

Evolution of Light wave systems, System components, Optical fibers - Step Index & Graded index - Mode theory, Fiber modes – Dispersion in fibers, Limitations due to dispersion - Dispersion shifted and dispersion flattened fibers - Fiber Losses - Non-linear effects

Unit 2 : Optical Transmitters (10hours)

Basic concepts - LED's structures - Spectral Distribution - Semiconductor lasers - Structures – Threshold conditions - SLM and STM operation - Transmitter design.

Unit 3 : Optical Detectors And Amplifiers (10hours)

Basic Concepts - PIN and APD diodes structures, Photo detector Noise, Receiver design. Amplifiers: Basic concepts - Semiconductor optical amplifiers; Raman - and Brillouin amplifiers - Erbium-doped fiber amplifiers, pumping requirements, cascaded in-line amplifiers.

Unit 4 : Coherent Lightwave Systems (6 hours)

Homodyne and heterodyne detectors - Modulation formats - Demodulation schemes - BER in synchronous receivers - Sensitivity degradation – Post - and pre compensation techniques - Optical solitons - Soliton based communication system.

Unit 5 : Multichannel Systems (6 hours)

WDM systems, Multiple access networks - WDM Components - Hetero wavelength linear crosstalk and homo wavelength Linear Crosstalk – TDM, Channel multiplexing and demulltiplexing - Code-division multiplexing.

Reference Books

1. G.P.Agrawal, "Fiber Optic Communication Systems", 3rd Edition, John Wiley & Sons, New York, 2002.
2. G. Keiser, "Optical Fiber Communication Systems", McGraw Hill, New York 2000.
3. Franz & Jain, "Optical Communication, System and Components", Narosa Publications, New Delhi 2000.
4. Djafar K. Mynbaev Lowell and Scheiner, "Fiber Optic Communication Technology", Pearson Education Asia, 2001.

MEDC-202 Wireless Communications and Networks

MEDC-202	Wireless Communications and Networks	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To provide an overview of Wireless Communication networks area and its applications in communication engineering.
2. To appreciate the contribution of Wireless Communication networks to overall technological growth.
3. To explain the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.

Course Outcomes:

1. Understand fundamentals of wireless communications.
2. Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.
3. Demonstrate basic skills for cellular networks design.
4. Apply knowledge of TCP/IP extensions for mobile and wireless networking.

UNIT NO I ; WIRELESS COMMUNICATIONS SYSTEMS & FUNDAMENTALS: (10 HOURS)
Introduction to Wireless Communications Systems, examples, comparisons & trends, Cellular concepts - frequency reuse, strategies, Interference & System capacity, Trucking & grade of service, Improving coverage & capacity in Cellular Systems.

UNIT NO II : MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION: (10 HOURS)
FDMA, TDMA, SSMA, (FHMA/CDMA / Hybrid techniques), SDMA technique (as applicable to Wireless Communications), Packet radio access-protocols, CSMA protocols, Reservation protocols, Capture effect in packet radio, Capacity of Cellular Systems.

UNIT NO III :WIRELESS NETWORKING: (10 HOURS)
Introduction, differences in wireless & fixed telephone networks, Traffic routing in Wireless Networks, Circuit switching, Packet switching, X.25 protocol, Wireless & Mobile data services: Cellular Digital Packet Data (CDPD), Data oriented CDPD Network advanced radio data information systems, RAM Mobile Data (RMD), Common Channel Signaling (CCS), Signaling System no.7 (SS7)-protocols, ISDN, Broad band ISDN and ATM Network services part, user part, Signaling traffic, services & performance. GPRS and higher data rates, Short Messaging Service in GSM, Mobile application protocol.

UNIT NO IV : MOBILE IP AND WIRELESS APPLICATION PROTOCOL: (6 HOURS)

Mobile IP operation of mobile IP, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, Wireless transaction, Wireless datagram protocol.

Unit No V : Wireless LAN: (6 hours)

Infrared LANs, Spread spectrum LANs, Narrow bank microwave LANs, IEEE 802 protocol Architecture, IEEE802 architecture and services, 802.11 medium access control, 802.11 Physical layer. Adhoc Wireless Networks- Cellular and Adhoc Wireless Networks, Applications, MAC protocols, Routing, Multicasting, Transport layer protocols, Quality of service browsing, Adhoc Wireless Internet

Reference Books

1. Wireless Communication and Networking - Williams Stallings, 2003 PHI.
2. Wireless Communication, Principles- Theodore, S Rappaport 2nd Edn, 2002, PHI
3. Principles of Wireless Networks – KavehPah Laven and P.KrishnaMurthy, 2002, PE Reference books:
1. Wireless Digital Communications - Kamilo Fecher, 1990, PHI.
2. Telecommunication System Engineering – Roger I.Freeman, 4/ed, Wiley-Interscience, Jhon Wiley & Sons, 200

MEDC-203 Advanced Data Communications

MEDC-203	Advanced Data Communications	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To learn about basics of Data Communication networks, different protocols, standards and layering concepts.
2. To study about error detection and correction techniques.
3. Know about link layer protocol and point to point protocols.
4. To understand Medium Access Control sub layer protocols

Course Outcomes:

1. Understand the concepts of Data Communication networks, different protocols, standards and layering.
2. Acquire the knowledge of error detection, forward and reverse error correction techniques.
3. Analyze link layer protocol and point to point protocols

Unit-I: Digital Modulation: (10 hours)

Introduction, Information Capacity Bits, Bit Rate, Baud, and M-ARY Coding, ASK, FSK, PSK, QAM, BPSK, QPSK, 8PSK, 16PSK, 8QAM, 16QAM, DPSK – Methods, Band Width Efficiency, Carrier Recovery, Clock Recovery.

U**nit -II: Basic Concepts of Data Communications, Interfaces and Modems:** (10 hours)

Data Communication- Components, Networks, Distributed Processing, Network Criteria- Applications, Protocols and Standards, Standards Organizations- Regulatory Agencies, Line Configuration- Point-to-point- Multipoint, Topology- Mesh- Star- Tree- Bus- Ring- Hybrid Topologies, Transmission Modes- Simplex- Half duplex- Full Duplex, Categories of Networks- LAN, MAN, WAN and Internetworking, Digital Data Transmission- Parallel and Serial, DTE- DCE Interface- Data Terminal Equipment, Data Circuit- Terminating Equipment, Standards EIA 232 Interface, Other Interface Standards, Modems- Transmission Rates.

Unit-III: Error Detection and Correction: (10 hours)

Types of Errors- Single- Bit Error, CRC (Cyclic Redundancy Check)- Performance, Checksum, Error Correction- Single-Bit Error Correction, Hamming Code. Data link Control: Stop and Wait, Sliding Window Protocols. Data Link Protocols: Asynchronous Protocols, Synchronous Protocols, Character Oriented Protocol- Binary Synchronous Communication (BSC) - BSC Frames- Data Transparency, Bit

Oriented Protocols – HDLC, Link Access Protocols.

Unit-IV: Switching: (6 hours)

Circuit Switching- Space Division Switches- Time Division Switches- TDM Bus- Space and Time Division Switching Combinations- Public Switched Telephone Network, Packet Switching- Datagram Approach- Virtual Circuit Approach- Circuit Switched Connection Versus Virtual Circuit Connection, Message Switching. Multiplexing: Time Division Multiplexing (TDM), Synchronous Time Division Multiplexing, Digital Hierarchy, Statistical Time Division Multiplexing.

Unit-V: Multiple Access: (6 hours)

Random Access, Aloha- Carrier Sense Multiple Access (CSMA)- Carrier Sense Multiple Access with Collision Detection (CSMA)- Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA), Controlled Access- Reservation- Polling- Token Passing, Channelization- Frequency- Division Multiple Access (FDMA), Time - Division Multiple Access (TDMA), - Code - Division Multiple Access (CDMA).

TEXT BOOKS:

1. Data Communication and Computer Networking - B. A.Forouzan, 3rd ed., 2008, TMH.
2. Advanced Electronic Communication Systems - W. Tomasi, 5 ed., 2008, PEI.
3. Data Communications and Computer Networks - Prakash C. Gupta, 2006, PHI.
4. Data and Computer Communications - William Stallings, 8th ed., 2007, PHI.
5. Data Communication and Tele Processing Systems - T. Housely, 2nd Edition, 2008, BSP.
6. Data Communications and Computer Networks- Brijendra Singh, 2nd ed., 2005, PHI.
5. Telecommunication System Engineering – Roger L. Freeman, 4/ed., Wiley-Interscience, John Wiley & Sons, 2004.

MEDC-204 Telecommunication Switching & Networks

MEDC-204	Telecommunication Switching & Networks	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To understand the working principles of switching systems from manual and electromechanical systems to stored program control systems.

Course outcomes:

1. Explain the working principle of switching systems involved in telecommunication switching
2. Assess the need for voice digitization and T Carrier systems
3. Compare and analyze Line coding techniques and examine its error performance

Unit-I Resource sharing and need for switching; (10 hours)
Circuit switching, Store and forward switching, Packet switching, electronic space division switching, Need for networks, Two stage networks, Three stage networks and n-stage networks.

Unit-II Time division switching: (10 hours)
Time switching, space switching, Three stage combination switching, n-stage combination switching; Traffic engineering: Hybrid switching, Two/Four wire transmission, Erlang formula and signaling.

Unit-III High speed digital access: (10 hours)
DSL technology, Cable Modem, SONET.

Unit-IV Local area networks: (6 hours)
Traditional ETHERNET, fast ETHERNET, Gigabit ETHERNET, Wireless LAN, Bluetooth, Connecting LAN's, Backbone networks.

Unit-V Integrated Services Digital Network: (6 hours)
Network & protocol architecture, user network interfaces, signaling, inter networking, ISDN standards, expert systems in ISDN, Broadband ISDN.

Reference Books
1. Telecommunication Switching Systems and Networks- Thiagarajan Viswanathan, Prentice Hall, New Delhi, 2001.
2. Data Communications and Networking- B.A. Forouzan, Tata McGrawhill, Third Edn., 2004

MEDC-205 Cellular and Mobile Communication

MEDC-205	Cellular and Mobile Communication	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To expose the students to understand mobile radio communication principles and to study the recent trends adopted in cellular systems and wireless standards.

Course Outcomes:

1. Discuss the cellular system design and technical challenges.
2. Analyze the Mobile radio propagation, fading, diversity concepts and the channel modeling.
3. Analyze the design parameters, link design, smart antenna, beam forming and MIMO systems.

Unit -1 : Wireless Communications : (10 hours)
Introduction to wireless communications , examples of wireless communication system , the Cellular concept and system design fundamentals , Frequency reuse, Channel assignment strategies , Handoff strategies , Interfearance and system capacity , Trunk and grade services , Methods for improving coverage and capacity in cellular system .

Unit-2: Multiple Access Techniques (10 hours)
Multiple access techniques for wireless communications FDMA , TDMA , Spread spectrum techniques , SDMA , Packet Radio , CSMA , Capacity of cellular CDMA with multiple cells and capacity of SDMA.

Unit-3: Wireless Systems And Standards: (10 hours)
AMPS , IS-94, GSM traffic, Examples of GSM cell , Frame structure of GSM cell, details of forward and reverse CDMA channels.

Unit-4: Personal Access Communication Systems(6 hours)
Personal Mobile satellite communications, Integrating GEO, LEO, MEO Satellite and terrestrial mobile systems , Rake receiver and Advanced Rake receiver,

Unit-5: Mobile Radio propagation (6 hours)
Large scale path loss , Reflection , Diffraction , Scattering , Outdoor and Indoor propagation models , Small signal fading and multi path , measurement of small scale path loss , parameters of multi path channels , fading due to multi path , fading effect due to Doppler spread , small scale fading models , equalization , Diversity .

Reference Books

1.Wireless Communications Principles and Practice , Second Edition , THEODORE S.REPPAPORT .
2.Wireless Digital Communications , DR. KAMILO FEHER .
3.Electronic Communication system , WAYNE TOMASI.
4.Wireless Communications , SANJY SHARMA.

MEDC-206

Lab -1 : Modeling & Simulation Lab

MEDC-206	Lab -1 : Modeling & Simulation Lab	0L:0T:6P	6 credits	6Hrs/Week

LIST OF EXPERIMENTS

1 .Write a program to search an element in a two dimensional array

2. Using iteration and recursion concepts write programs for finding the element in the array using the Binary search method.

3 .Write a program to perform following operations on tables using functions only - Addition , Subtraction, Multiplication, Transpose.

4 . Write a program using iteration and recursion concepts for quick sort.

5 . Write a program to implement various operations on strings.

6. Write a program for swapping two numbers using call by value and call by reference strategies.

7. Write a program to implement Binary search tree.

8. Write a program to create a Linked List and perform operations such as insert, delete, update and reverse.

9. Write a program to simulate various sorting and searching algorithms.

10. Write a program to simulate various Graph traversing techniques.

11 . Write a program to simulate various tree traversal techniques.

MEDC-207
Lab -2 : Simulation in MATLAB Environment

MEDC-207	Lab -2 : Simulation in MATLAB Environment	0L:0T:6P	6 credits	6Hrs/Week

LIST OF EXPERIMENT

1. Study of MATLAB 7.0
2. Arithmatic operation using MATLAB 7.0
3. Generation of Signals
4. Linear convolution using MATLAB
5. Program illustrates the design of a Butterworth bandstop filter.
6. To implement a causal IIR filter implemented in the Direct Form II structure, the function direct2 given below can be employed.
7. To implement a causal IIR filter implemented in the Direct Form II structure, the function direct2 given below can be employed
8. Program illustrates the design of a causal IIR filter, its simulation in transposed Direct Form II, and its application in filtering a signal.
9. Program up-sampler.
10. Illustration of Down-Sampling by an Integer Factor
11. Use fir2 to create a bandlimited input sequence
12. Program P10 4 can be employed to study the frequency-domain properties of the downsampler
13. FIR filter using Rectangular Window
14. FIR filter using Hamming Window
15. Circular Convolution of two sequences using MATLAB
16. IIR filter design using MATLAB

ELECTIVE -1
MEDC – 301(A) WIRELESS LAN

MEDC-301(A)	WIRELESS LAN	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To impart the new concepts in Advanced Wireless Communications

Course Outcomes:

1. Understand fundamentals of wireless communications.
2. Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.
3. Demonstrate basic skills for cellular networks design.
4. Apply knowledge of TCP/IP extensions for mobile and wireless networking

UNIT –I: (10 HOURS)

Wireless System & Random Access Protocols: Introduction, First and Second Generation Cellular Systems, Cellular Communications from 1G to 3G, Wireless 4G systems, The Wireless Spectrum; Random Access Methods: Pure ALOHA, Slotted ALOHA, Carrier Sense Multiple Access (CSMA), Carrier Sense Multiple Access with Collision Detection (CSMA/CD), Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA).

UNIT –II: (10 HOURS)

Wireless LANs: Introduction, importance of Wireless LANs, WLAN Topologies, Transmission Techniques: Wired Networks, Wireless Networks, comparison of wired and Wireless LANs; WLAN Technologies: Infrared technology, UHF narrowband technology, Spread Spectrum technology

UNIT –III: (10 HOURS)

The IEEE 802.11 Standard for Wireless LANs: Network Architecture, Physical layer, The Medium Access Control Layer; MAC Layer issues: Hidden Terminal Problem, Reliability, Collision avoidance, Congestion avoidance, Congestion control, Security, The IEEE 802.11e MAC protocol

UNIT –IV: (6 HOURS)

Wireless PANs: Introduction, importance of Wireless PANs, The Bluetooth technology: history and applications, technical overview, the Bluetooth specifications, piconet synchronization and Bluetooth

clocks, Master-Slave Switch; Bluetooth security; Enhancements to Bluetooth: Bluetooth interference issues, Intra and Inter Piconet scheduling, Bridge selection, Traffic Engineering, QoS and Dynamics Slot Assigment, Scatternet formation.

UNIT –V: (6 HOURS)

The IEEE 802.15 working Group for WPANs: The IEEE 802.15.3, The IEEE 802.15.4, ZigBee Technology, ZigBee components and network topologies, The IEEE 802.15.4 LR-WPAN Device architecture: Physical Layer, Data Link Layer, The Network Layer, Applications; IEEE 802.15.3a Ultra wideband.

REFERENCE BOOKS

1. Ad Hoc and Sensor Networks - Carlos de Morais Cordeiro and Dharma Prakash Agrawal, World Scientific,
2011.
2. Wireless Communications and Networking - Vijay K.Garg, Morgan Kaufmann
Publishers, 2009.
3. Wireless Networks - Kaveh Pahlaram, Prashant Krishnamurthy, PHI, 2002.
4. Wireless Communication- Marks Ciampor, Jeorge Olenewa, Cengage Learning, 2007.

MEDC – 301(B) Soft Computing Techniques

MEDC-301(B)	Soft Computing Techniques	3L:1T:0P	4 credits	6Hrs/Week

Course Preamble:

1. Develop the skills to gain a basic understanding of neural network theory and fuzzy logic theory.
2. Introduce students to artificial neural networks and fuzzy theory from an engineering perspective

Course Outcomes

1. Comprehend the fuzzy logic and the concept of fuzziness involved in various
2. systems and fuzzy set theory.
3. Understand the concepts of fuzzy sets, knowledge representation using fuzzy
4. rules, approximate reasoning, fuzzy inference systems, and fuzzy logic
5. To understand the fundamental theory and concepts of neural networks, Identify
6. different neural network architectures, algorithms, applications and their
7. limitations

UNIT –I: (10 HOURS)

Introduction: Approaches to intelligent control, Architecture for intelligent control, Symbolic reasoning system, Rule-based systems, the AI approach, Knowledge representation - Expert systems.

UNIT –II: (10 HOURS)

Artificial Neural Networks: Concept of Artificial Neural Networks and its basic mathematical model, McCulloch-Pitts neuron model, simple perceptron, Adaline and Madaline, Feed-forward Multilayer Perceptron, Learning and Training the neural network, Data Processing: Scaling, Fourier transformation, principal-component analysis and wavelet transformations, Hopfield network, Self-organizing network and Recurrent network, Neural Network based controller.

UNIT –III: (10 HOURS)

Fuzzy Logic System: Introduction to crisp sets and fuzzy sets, basic fuzzy set operation and approximate reasoning, Introduction to fuzzy logic modeling and control, Fuzzification, inferencing and defuzzification, Fuzzy knowledge and rule bases, Fuzzy modeling and control schemes for nonlinear systems, Selforganizing fuzzy logic control, Fuzzy logic control for nonlinear time delay system.

UNIT –IV: (10 HOURS)

Genetic Algorithm: Basic concept of Genetic algorithm and detail algorithmic steps, Adjustment of free parameters, Solution of typical control problems using genetic algorithm, Concept on some other search techniques like Tabu search and Ant-colony search techniques for solving optimization problems.

UNIT –V: (6 HOURS)

Applications: GA application to power system optimisation problem, Case studies: Identification and control of linear and nonlinear dynamic systems using MATLAB-Neural Network toolbox, Stability analysis of Neural-Network interconnection systems, Implementation of fuzzy logic controller using MATLAB fuzzy-logic toolbox, Stability analysis of fuzzy control systems.

REFERENCE BOOKS

1. Introduction to Artificial Neural Systems - Jacek.M.Zurada, Jaico Publishing House, 1999.
2. Neural Networks and Fuzzy Systems - Kosko, B., Prentice-Hall of India Pvt. Ltd., 1994.
3. Fuzzy Sets, Uncertainty and Information - Klir G.J. & Folger T.A., Prentice-Hall of India Pvt. Ltd., 1993.
4. Fuzzy Set Theory and Its Applications - Zimmerman H.J. Kluwer Academic Publishers, 1994.
3. Introduction to Fuzzy Control - Driankov, Hellendroon, Narosa Publishers.
5. Artificial Neural Networks - Dr. B. Yagananarayana, 1999, PHI, New Delhi.
6. Elements of Artificial Neural Networks - Kishan Mehrotra, Chelkuri K. Mohan, Sanjay Ranka, Penram International.
7. Artificial Neural Network –Simon Haykin, 2nd Ed., Pearson Education.
8. Introduction Neural Networks Using MATLAB 6.0 - S.N. Shivanandam, S. Sumati, S. N. Deepa,1/e, TMH, New Delhi.

MEDC – 302(A) Network Design Technology

MEDC-302(A)	Network Design Technology	0L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To develop an understanding of computer networking basics.
2. To develop an understanding of different components of computer networks, various protocols, modern technologies and their applications.

Course Outcomes

1. Recognize the technological trends of Network Design Technology.
2. Discuss the key technological components of the Network.
3. Evaluate the challenges in building networks and solutions to those.

UNIT 1 : (10 HOURS)

Review of concepts of Layering and Layered models- OSI & TCP/IP, LAN Technology, transmission Medium, Topology, Medium Access Control (MAC) Techniques including MAC& LLC sub layers,

UNIT 1I : (10 HOURS)

LAN system, Ethernet system, Fast Ethernet& Gigabit Ethernet, Token Ring, FDDI Internet working with TCP/IP, Internet Protocol (IP) Suite including IP V4, IP V6 Transport Protocols, TCP and UDP

UNIT 1I : (10 HOURS)

Introduction to IP routing, default route,routing operation, various interior gateways protocols like RIP, OSPF, difference between RIP and OSPF, and exterior gateway protocols like BGP.

UNIT 1V : (6 HOURS)

Introduction to label Switching and MPLS,WAN technology: WAN Vs LAN, Circuit switching mechanism and network design, packet ,switched networking including routing and traffic control, X.25ISDN and Broadband ISDN: Overview, ISDN, interface and functions, layers and ISDN services-ISDN standards and services High Speed network frame relay, frame relay protocols, services and congestion control,

UNIT V : (6 HOURS)

ATM: ATM adaptation layer (AAL), ATM traffic and congestion control ATM LAN, ATM LAN emulation and multi protocols over ATM (MPOA)

REFERENCE BOOKS.

1. Redia Pearlman, Interconnections, bridges, routers, switches and Int protocols Pearson Edu
2. Comer, Internetworking with TCP/IP Vol. I PHI
3. Tenenbaum, Computer Networks, PHI
4. Forouzan B, Data communication and networking, TMH.
5. Stalling W, Data and computer communications, PHI
6. Hardy, Inside networks, PHI
7. Glover and Grant, Digital Communication, PHI

MEDC – 302(B) Micro Controller System Design

MEDC-302(B)	Micro Controller System Design	3L:1T:0P	4 credits	4Hrs/Week

Course Preamble:

1. To relate the basic architecture and addressing modes of a microcontroller.
2. To summarize the principles of top down design to microcontroller software development
3. To demonstrate assembly language programs for the advanced Microcontroller , assembly language code for high-level

Course Outcomes:

1. Distinguish Types of computers & microcontrollers,
2. Generalize 8-Bit, 16- Bit & 32 Bit advanced Microcontrollers.
3. Construct Real time Applications of Microcontrollers.

UNIT 1 : (10HOURS)

Review of 8-Bit and 16-bit microprocessor, support chips and interfacing techniques, single chip micro-computers, architecture, program and data memory, ports, input Output interfacing and programming,

UNIT 1I : (10HOURS)

Single chip micro controllers- INTEL 8051/ 8751, MOTOROLA 68HC0/68HC11 architecture, instruction set and programming, Memory mapping, addressing modes, Registers, expanded modes. Interrupt handling timing and serial I / O.

UNIT II1 : (10HOURS)

Software development Modular approach, integrated software development environment, Object oriented interfacing and programming, Recursion and debugging.

UNIT 1V : (6 HOURS)

ATMEL 89C51 / 52 and PIC micro-Controllers- Case studies .Design and application of Micro-Controller in Data acquisition, Embedded controllers, Process control etc.

UNIT V : (6 HOURS)

DSP Processor architecture and sample design using TI – DSP, digital signal process a TI architectural history, dsp architecture evolution, dsp architecture enabling technologies, architecture optimized for dsp.

REFERENCE BOOKS:

1. Embedded Systems 8051 By Majidi & Majidi
2. Design With Micro-Controllers By John P. Peatman Tmh
3. Embedded Micro-Computers System By Jonathan W. Valvano
4. Data Manuals – Intel Motorola

MEDC-303
Seminar

MEDC-303	**Seminar**	**0L:0T:4P**	**4 credits**	**4Hrs/Week**

Course Preamble : To Analyses the topic of seminar with scope of work.

Course Outcome: This course helps to collect useful information from the literature on the assigned topic.

Seminar topic: One faculty assigned to each M. Tech student. Usually the assigned faculty suggest a particular research topic to the concern student. Subsequently student collects research papers. The faculty assigned/ supervisor gives one / two research paper and advice the student to make detail study on a. Authors contribution b. Mathematical analysis c. Performance comparison parameters

MEDC-304

Dissertation Part I

MEDC-304	**Dissertation Part I**	**0L:0T:8P**	**8 credits**	**6Hrs/Week**

Course Preambles: To analyze the title and proposed a model for Dissertation.

Course outcomes: To study of literature survey, formulate the research problem and develop necessary methodology related to research problem. A workable design/ algorithm to be developed based on the proposed methodology, algorithm a design to be noted.

Course Contents: Title of the Dissertation- This should be carefully decided by the student after discussing with the dissertation supervisor or the guide. Explain the relevance and importance of the dissertation; Write a brief (1 or 2 pages) introduction of the dissertation explaining its relevance and importance.

Student has to spend two hours daily in library to analyze the problem. It is also essential for student to meet supervisor twice in a week to discuss the research problem. After four weeks of registration the first evaluation has been done before committee to revive the literature survey and formulation of the problem. .In second the evaluation, the student has to show the progress of work in terms of design level, mathematical model/ algorithm etc. At end of semester, simulation based design has been analyzed by the committee.

MEDC- 401
Dissertation Part- II

MEDC-401	**Dissertation Part II**	**0L:0T:20P**	**20 credits**	**6Hrs/Week**

NOTES1.

Dissertation ** to be continued from III semester.
2. Final evaluation of dissertation will be based on the cumulative performance in all III and IV.
3. It is desirable to have one publication from the dissertation.