

Department of Electronics and Communication Engineering

Lesson Plan

Name of the Subject: Detection and Estimation of Signals (14MT23806)

Class & Semester: M. Tech. (CMS) – II Semester

Name of the faculty Member: Ms. H.D.Praveena

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: Detection Theory				
1.	Maximum-likelihood decision criterion	1	T1	Neyman-Pearson criterion for Radar detection of variable amplitude signals, Conditional Probability density function, Bayes' Theorem, Q Function.
2.	Neyman-Pearson criterion	2	T1	
3.	Probability-of-error criterion	2	T1	
4.	Bayes risk criterion	1	T1	
5.	Min-max criterion	1	T1	
6.	Receiver operating characteristics	2	T1	
7.	Problems	3	T1	
Total periods required:		12		
UNIT – II: Binary Decisions: Multiple Observations				
8.	Vector observations	2	T1	Properties of Gaussian Probability density function, Concept of Convolution, Whitening Process.
9.	The general Gaussian problem	2	T1	
10.	Waveform Observation in Additive Gaussian Noise	1	T1	
11.	The Integrating Optimum Receiver	2	T1	
12.	Matched Filter Receiver	2	T1	
13.	problems	2	T1	
Total periods required:		11		
UNIT -III: Estimation Theory				
14.	Maximum likelihood estimation	1	T1	Mean & Median of Conditional Probability density function, Multiple parameter Estimation, Sequential Estimation.
15.	Bayes estimation criterion: Mean Square Error Criterion	1	T1	
16.	Uniform Cost Function	1	T1	
17.	Absolute-Value Cost Function	1	T1	

18.	Linear Minimum-Variance Method	2	T1	
19.	Least-Squares Method	1	T1	
20.	Estimation in the presence of Gaussian noise	1	T1	
21.	Linear observation	1	T1	
22.	Non-linear estimation	2	T1	
23.	problems	1	T1	
Total periods required:		12		
UNIT – IV: Properties Of Estimators				
24.	Bias	1	T1	Performance evaluation of Estimators when imperfect source and channel models are used.
25.	Efficiency	2	T1	
26.	Cramer-Rao bound	2	T1	
27.	Asymptotic properties	1	T1	
28.	Sensitivity and error analysis	1	T1	
29.	Problems	1	T1	
Total periods required:		08		
UNIT – V: State Estimation & Statistical Estimation of Parameters				
30.	State Estimation: Prediction	2	T1	Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh density functions. Research topics: Extended Kalman filter, Super resolution Array Processing.
31.	Kalman filter	2	T1	
32.	Problems	2	T2	
33.	Statistical Estimation of Parameters: Concept of sufficient statistics	1	R2	
34.	Exponential families of Distributions	1	R2	
35.	Exponential families and Maximum likelihood estimation	2	R2	
36.	Uniformly minimum-variance unbiased estimation	1	R2	
Total periods required:		11		
Grand total periods required:		54		

Text Books:

T1: James L.Melsa & David L.Cohn, “Decision and Estimation Theory”, McGraw Hill, 1978.

T2: Steven M. Kay, “Fundamentals of Statistical Signal Processing Vol. 1: Estimation Theory, Prentice Hall, 1993, Vol. 2: Detection Theory”, Prentice Hall Inc., 1998.

Reference Books:

R1: Harry L. Van Trees, “Detection, Estimation and Modulation Theory”, Part 1, John Wiley & Sons Inc. 1968.

R2: Jerry M. Mendel, “Lessons in Estimation Theory for Signal Processing, Communication and Control”, Prentice Hall Inc., 1995.

R3: Sophocles J.Orfanidis, “Optimum Signal Processing”, McGraw Hill, 2nd edition, 1988.

**Signature of the faculty Member
framing the syllabus**

Signature of the Chairman (BOS)

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet-517 102

Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: DISPLAY TECHNOLOGIES AND DEVICES (14MT23801)

Class & Semester: M. Tech. (DECS) – II Semester

Name of the faculty Member: K.Neelima

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: FUNDAMENTALS OF DISPLAY TECHNOLOGY				
1.	Light	1	T1	Quantum Mechanics
2.	Modulation of Light	2	T1	
3.	Human vision and perception for display – Performance of the Human Visual system	2	R4	
4.	Luminescence	1	T1	
5.	Photoluminescence (PL)	1	T1	
6.	Cathodoluminescence (CL)	1	T1	
7.	Electroluminescence (EL)	1	T1	
Total periods required:		09		
UNIT – II: INORGANIC DISPLAY TECHNOLOGY				
8.	Cathode-ray tube (CRT) display	2	T7	Display Applications
9.	Flat-Panel Display	2	T2	
10.	Field Emission Display (FED)	2	T2	
11.	Plasma Display Panel (PDP)	2	T2	
12.	Semiconductor Light-Emitting Diode (LED) Display	2	T2	
13.	Micro Display and Others	2	R3	
Total periods required:		12		
UNIT -III: DISPLAY MEASUREMENTS				
14.	photometric measurements	2	T3	Performance Requirements
15.	colorimetric measurements	2	T3	
16.	display measurement system	2	T3	
Total periods required:		06		
UNIT -IV: LIQUID CRYSTAL DISPLAYS AND TFT				
17.	Liquid Crystal – Liquid Crystal Materials, Liquid Crystal Alignment	2	T2	Display Specifications
18.	Twisted Nematic	1		
19.	In-plane switching, Fringe Filed	2	T2	

	switching			
20.	Thin film transistors (TFT) - device structure and performance	2	T2	
21.	amorphous silicon TFT	2	T2	
22.	polycrystalline silicon TFT	2	T2	
23.	organic TFT	1	T2	
Total periods required:		12		
UNIT-V: AMLCD and OLED				
24.	Active matrix liquid crystal display (AMLCD) - structure of AMLCD	2	R1	Performance Characteristics of OLEDs Research Topics: Off Floating Display Technology
25.	Operating Principles of AMLCD	2	R1	
26.	Manufacturing of AMLCD	1	R1	
27.	AMLCD Electronics	1	R1	
28.	Performance characteristics	1	R1	
29.	Organic light emission diode (OLED) – Generation of Excited States by Charge Recombination,	2	R2	
30.	Electrical Characteristics of OLEDs	1	R2	
31.	Optical Characteristics of OLEDs	1	R2	
Total periods required:		11		
Grand total periods required:		50		

TEXT BOOKS:

T1: John Wilson and John Hawkes, “Optoelectronics: An Introduction”, Prentice Hall, 3rd Edition, 1998.

T2: Jiun-Haw Lee, david N.Liu, Shin-Tson Wu,”Introduction to Flat Panel Displays, John Wiley & Sons, 2008.

T3: Matthew S.brennesholtz, Edward H.stupp,” Projection Displays”, John Wiley & Sons, 2008.

REFERENCE BOOKS:

R1: Willem den Boer, “Active Matrix Liquid Crystal Displays”, Elsevier, 2005.

R2: Jan Kalinowski, “Organic Light-Emitting Diodes”, Marcel Dekker, 2005.

R3: David Armitage, Ian Underwood and Shin-Tson Wu, “Introduction to Microdisplays”, John Wiley & Sons Ltd, 2006.

R4: Robert L.Myers, “Display Interfaces: Fundamentals and Standards”, John Wiley & sons, 2003.

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SREE VIDYANIKETHAN ENGINEERING COLLEGE
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Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: Information Theory and Coding Techniques (14MT23802)

Class & Semester: M. Tech. (CMS) – I Semester

Name of the faculty Member: P.Padmaja

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: INTRODUCTION				
1.	Entropy: Discrete stationary sources, Markov sources	2	T1	The entropy power inequality and the Brunn–Minkowski Inequality, Lempel-Ziv coding, Arithmetic coding.
2.	Entropy of a discrete Random variable- Joint, conditional, relative entropy, Mutual Information and conditional mutual information	2	T1	
3.	Chain rules for entropy, relative entropy and mutual Information	1	T1	
4.	Differential Entropy - Joint, relative, conditional differential entropy and Mutual information	1	T1	
5.	Loss less Source coding: Uniquely decodable codes	1	T1	
6.	Instantaneous codes	1	T1	
7.	Kraft's inequality	1	T1	
8.	Optimal codes	1	T1	
9.	Huffman code	1	T1	
10.	Shannon's Source Coding Theorem	1	T1	
Total periods required:		12		
UNIT –II: CHANNEL CAPACITY				
11.	Capacity computation for some simple channels	1	T1	Rate distortion
12.	Channel Coding Theorem,	1	T1	
13.	Fano's inequality and the converse to the Coding Theorem,	1	T1	
14.	Equality in the converse to the coding theorem	1	T1	
15.	The joint source Channel Coding Theorem	1	T1	
16.	The Gaussian channels- Capacity	2	T1	

	calculation for Band limited Gaussian channels			Theory, Arimoto-Blahut algorithm.
17.	Parallel Gaussian Channels	2	T1	
18.	Capacity of channels with colored Gaussian noise	1	T1	
Total periods required:		10		
UNIT -III: CHANNEL CODING-1				
19.	Linear Block Codes: Introduction to Linear block codes	1	T2	Error probability after decoding, Structured Sequences, Usefulness of the Standard Array.
20.	Generator Matrix	1	T2	
21.	Systematic Linear Block codes	1	T2	
22.	Encoder Implementation of Linear Block Codes	1	T2	
23.	Parity Check Matrix	1	T2	
24.	Syndrome testing	1	T2	
25.	Error Detecting and correcting capability of Linear Block codes	1	T2	
26.	Application of Block codes for error control in data storage Systems	1	T2	
Total periods required:		08		
UNIT – IV: CHANNEL CODING-2				
27.	Cyclic Codes: Algebraic Structure of Cyclic Codes	1	T2	Trellis-Coded Modulation-The Idea Behind Trellis-Coded Modulation (TCM), TCM Encoding, TCM Decoding.
28.	Binary Cyclic Code Properties	1	T2	
29.	Encoding in Systematic Form ,Systematic Encoding with an (n - k)-Stage Shift Register	1	T2	
30.	Error Detection with an (n - k)-Stage Shift Register	1	T2	
31.	Well-Known Block Codes-Hamming Codes	1	T2	
32.	Extended Golay Code	1	T2	
33.	BCH Codes	1	T2	
34.	Convolutional Codes: Convolution Encoding	1	T2	
35.	Convolutional Encoder Representation	1	T2	
36.	Formulation of the Convolutional Decoding Problem	1	T2	
37.	Properties of Convolutional Codes	1	T2	

38.	Sequential Decoding	1	T2	
39.	Feedback Decoding	1	T2	
40.	Application of Viterbi and sequential decoding.	1	T2	
Total periods required:		14		
UNIT – V: CHANNEL CODING-3				
41.	Reed-Solomon Codes- Reed-Solomon Error Probability	1	T2	Research Topics: Applications of Reed Solomon codes in Deep space Telecommunications
42.	Finite Fields, Reed-Solomon Encoding	1	T2	
43.	Reed-Solomon Decoding	1	T2	
44.	Interleaving and Concatenated Codes- Block Interleaving	1	T2	
45.	Convolutional Interleaving	1	T2	
46.	Concatenated Codes	1	T2	
47.	Coding and Interleaving Applied to the Compact Disc Digital Audio System- CIRC Encoding	1	T2	
48.	CIRC Decoding	1	T2	
49.	Turbo Codes- Turbo Code Concepts	1	T2	
50.	Encoding with Recursive Systematic Codes	1	T2	
51.	A Feedback Decoder	1	T2	
52.	The MAP Decoding Algorithm	1	T2	
Total periods required:		12		
Grand Total periods required:		56		

Text Books:

T1: Thomas M. Cover and Joy A. Thomas, Elements of Information Theory, John Wiley & Sons, 1st Edition, 1999.

T2: Bernard sklar, “Digital Communications – Fundamental and Application”, Pearson Education, 2nd Edition, 2009.

Reference Books:

R1: John G. Proakis, “Digital Communications”, Mc. Graw Hill Publication, 5th Edition, 2010.

R2: SHU LIN and Daniel J. Costello, Jr., “Error Control Coding – Fundamentals and Applications”, Prentice Hall , Second Edition, Prentice Hall ,2002.

R3: R. J. McEliece, The Theory of Information & Coding, Addison Wesley Publishing Co., 1977.

Signature of the faculty Member framing the syllabus

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Lesson Plan

Name of the Subject: Microcontroller Based System Design (14MT23803)

Name(s) of the faculty Member(s) framing syllabus: P. Madhu Kumar

Class & Semester: M. Tech (DECS) II SEM.

S. No.	Topic	No. of periods	Book(s) followed	Topics for Self Study
Unit I: 8051/31				
1.	8051 Architecture: Register organization, Architecture, Memory organization.	2	T1	Watch Dog timer, FRC , ICR and OCR in 16-bit Microcontrollers
2.	Addressing modes, Instruction set.	3	T1	
3.	On chip Resources- Timers, Interrupts, I/O ports, Interfacing I/O Devices, Serial Port.	2	T1	
4.	8051 Programming: Timer/Counter Programming.	1	T1	
5.	Serial Communication Programming	1	T1	
6.	Interrupt Programming	1	T1	
Total periods required:		10		
Unit II: ARM Controllers				
7.	ARM Embedded Systems: RISC VS CISC, ARM Hardware, System Software, Operating System, Applications	2	T2	Development & Debugging tools for microcontroller based system design
8.	ARM processor Fundamentals: Register Organization , CPSR, Pipeline, Core extension.	2	T2	

9.	ARM Instruction Set: Data processing, Branch, Load-store	2	T2	
10.	interrupts & program status register instructions.	2	T2	
11.	Thumb Instruction Set: register usage, ARM Thumb interworking	1	T2	
12.	Branch, Data processing instructions	1	T2	
13.	Load store, stack and software interrupt instructions	1	T2	
Total periods required:		11		
Unit III: PIC Microcontroller				
14.	Introduction to PIC Controllers: Block diagram of PIC16C74A, PIC16C62A.	1	T3	Microchip Programmers
15.	PIC Development Tools	1	T3	
16.	CPU Architecture and Instruction Set: Harvard architecture and Pipelining, Program Memory Considerations	1	T3	
17.	Register file structure	1	T3	
18.	Addressing modes, CPU registers	1	T3	
19.	Instruction Set, simple operations.	3	T3	
Total periods required:		08		
Unit IV PIC Interrupts and Timers				
20.	Loop Time, Subroutine, Timer2 and Interrupts: Timer2 use	1	T3	R/C servo control, H-bridge Motor control
21.	Interrupt logic, Timer2 Scalar initialization,	2	T3	
22.	IntService Interrupt Service Routine, Loop Time Subroutine.	1	T3	

23.	Interrupt Timing and Program size considerations: Interrupt Constraints, Improved Interrupt servicing	2	T3	
24.	Shortening an Interrupt handler, Critical regions	1	T3	
25.	External Interrupts and Timers: RB0/INT external interrupt input.	2	T3	
26.	Timer 0, Compare mode, Capture mode	2	T3	
27.	Timer1/CCP Programmable period scaler,Timer1 external event counter	2	T3	
28.	Timer1 and Sleep Mode, PWM outputs, Port B-Change Interrupts (pins RB7:RB4).	1	T3	
Total periods required:		14		
Unit V PIC System Design				
29.	I/O Port Expansion: Synchronous Serial Port Module, SPI, output and input port expansion, LCD Display.	2	T3	Case Study simple PDA using the Nokia 3310 Research Topic: Smile recognition using PIC Controllers
30.	I2C Bus for Peripheral Chip Access: I2C Bus Operation, I2C Bus Subroutines,	2	T3	
31.	DAC output	1	T3	
32.	Temperature sensor	1	T3	
33.	Serial EEPROM	1	T3	
34.	Analog to Digital Converter: ADC characteristics, ADC use.	1	T3	
35.	UART : Baud rate accuracy, Baud rate selection,	1	T3	
36.	UART Data Handling Circuitry, Initialization,	1	T3	
37.	UART Applications	2	T3	

Total periods required:	12	
Grand total periods required:	55	

Text Books:

T1: Muhammad Ali Mazidi, Janice G. Mazidi and Rolin D. McKinlay, 'The 8051 Microcontroller and Embedded Systems' Prentice Hall, 2005.

T2: Andrew N Sloss, Dominic Symes, Chris Wright, "ARM Systems Developers Guide: Designing and Optimizing System Software", Morgan Kaufmann Publishers, 2004.

T3: John B Peatman, "Design with PIC Microcontrollers", Pearson Education, I edition, 1998

Reference Books:

R1: Myke Predko, "Programming and customizing the 8051 Microcontroller", Tata McGraw Hill, 2001.

R2: Kenneth J Ayala, "The 8051 Microcontroller: Architecture, Programming and Applications", Thomson Publications, 1991.

R3: Muhammad Ali Mazidi, Rolin D. Mckinlay, Danny Causey ' PIC Microcontroller and Embedded Systems using Assembly and C for PIC18', Pearson Education 2008.

R4: John Iovine, 'PIC Microcontroller Project Book ', McGraw Hill, 2000

Signature(s) of the faculty Member(s)

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SREE VIDYANIKETHAN ENGINEERING COLLEGE
(Autonomous)

Sree Sainath Nagar, A. Rangampet-517 102

Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: NEURAL NETWORKS AND FUZZY SYSTEMS (14MT23807)

Class & Semester: M. Tech. (DECS) – II Semester

Name of the faculty Member: Dr. B. Polaiiah

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: Introduction to Neural Networks				
1.	Motivation for the Development of Neural Networks	1	T1 &T2	Biological and Artificial Neuron.
2.	Artificial Neural Networks and Biological Neural Network	1	T1 &T2	
3.	Typical Architectures and its Application areas	1	T1	
4.	Learning Methods, Setting Weights and Types of Activation functions.	2	T1	
5.	McCulloch - Pitts neuron, Architecture, Algorithm, Applications.	2	T1 &T2	
6.	Simple Neural Networks for pattern Classification, Architecture	1	T1	
7.	Biases and Thresholds, linear Separability, Data representation	2	T1 &T2	
8.	Hebb Net, Algorithm and Application, Architecture	2	T1	
9.	Perceptron learning rule Convergence theorem , Delta rule Perceptron Net, Algorithm and Application	2	T1 &T2	
Total periods required:		14		
UNIT – II: Back Propagation Neural Networks				
10.	Back Propagation, Architecture, Derivation of Learning rules	2	T1	Applications of No. of hidden layers (Multi layer neural net applications)
11.	No. of hidden layers, Learning factors, Algorithm and Applications	2	T1	
12.	Introduction Hopfield neural net, Discrete Architecture , algorithm,	2	T1	
13.	Continuous architecture , Algorithm, Applications.	2	T1	
Total periods required:		8		

Department of Electronics and Communication Engineering

UNIT – III: Neural Networks Based On Competition				
14.	Fixed- weight competitive nets, Kohonen Self Organising Maps and applications	2	T2	Practice Engineering Problems by using Kohonen self Organising Maps
15.	Adaptive Resonance Theory: Basic architecture and operation	2	T2	
16.	Neural Network for control: Neuro controller, examples	2	T2	
17.	Functional diagram, Inverse dynamics , coping control action	1	T2	
18.	Case study: Neuro controller for DC motor speed control	1	T2	
19.	Neural networks for pattern recognition and classifications.	1	T2	
Total periods required:		9		
UNIT -IV: Introduction To Fuzzy System				
20.	Fuzzy sets: Properties of Fuzzy sets, operations on Fuzzy sets, examples	2	T3	Set Theory
21.	Fuzzy relations:-Cardinality of Fuzzy relations, examples	2	T3	
22.	Linguistic variables: Linguistic approximation and Fuzzy statements: Assignment statements with examples	2	T3	
23.	Fuzzy relations- Composition with examples	2	T3	
Total periods required:		8		
UNIT – V: Design Of Fuzzy Logic Controller				
24.	Functional diagram: Membership functions, Triangular, Trapezoidal -scale factors.	2	T3	Research Topic Areas: Temperature control, Load flow analysis in Thermal systems. And Neuro-Fuzzy and Fuzzy-Neuro control schemes for SISO/MIMO processes
25.	Membership value assignments using intuition and knowledge base, examples	2	T3	
26.	Defuzzification, Max-Membership principle, centroid method, weighted average method, examples	2	T3	
27.	Rule base, Choice of variable, derivation of rules, data base with examples	2	T3	
28.	Case study -Fuzzy logic Controller design for a temperature process	2	T3	
29.	Introduction to neuro -fuzzy and fuzzy-neuro control schemes	2	T3	
Total periods required:		12		

Grand total periods required:	51
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Text Books:

- T1. Laurene Fausett, Fundamentals of Neural Networks, Pearson Education, New Delhi, 2004.
- T2. S.N.Sivanandam, S.Sumathi, S.N.Deepa, Introduction to Neural Networks Using MATLAB 6.0, Tata McGraw-Hill, 2008.
- T3. Timothy J. Ross, Fuzzy Logic with Engineering Applications, 3rd edition, Tata McGraw-Hill, New York, 2012.

Reference Books:

- R1. Simon Haykin, Neural Networks- A Comprehensive Foundation, Pearson Education, 2008.
- R2. D. Driankov, H. Hellendoorn, M. Reinframe, An Introduction to Fuzzy Control, Narosa Publishing Co., New Delhi, 2001.

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Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: Optical Communications and Networks (14MT23808)

Class & Semester: M. Tech. (CMS) – I Semester & (DECS)-II Semester(Elective-II)

Name of the faculty Member: G.Madhavilatha

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I:				
1.	Evolution of fiber types	1	T1	Attenuation, Scattering losses, Fiber bend loss
2.	Guiding properties of fibers , Cross talk between fibers	1	T1	
3.	Coupled modes and mode mixing	1	T1	
4.	Dispersion properties of fibers	1	T1	
5.	Nonlinear effects of optical fibers-SRS, SBS, intensity dependent refractive index	2	T1	
6.	Characterization of materials for fibers	2	T1	
7.	Fiber preform preparation - Soot deposition, MCVD	1	T1	
8.	fiber drawing and control, roles of coating and jacketing	2	T1	
Total periods required:		11		
UNIT – II: OPTICAL CABLE DESIGN				
9.	Fiber design considerations-Fiber diameter, Cladding thickness, Low and high bit rate system	2	T1	Fiber Mechanical characteristics
10.	Design objectives and cable structures	2	T1	
11.	Fiber splicing- fiber end preparation, single fiber splices	2	T1	
12.	Array splices, measurement of splicing effects	2	T1	
13.	optical fiber connectors-The role of connectors, Connector alignment techniques	2	T1	
Total periods required:		10		

UNIT -III: FIBER OPTIC COMPONENTS FOR COMMUNICATION & NETWORKING				
14.	Couplers, Isolators and Circulators	2	T2	Pump Sources for Raman Amplifiers, Wavelength converters- Interferometric Techniques
15.	Multiplexers & filters- Bragg Gratings, Fabry-Perot Filters	2	T2	
16.	Mach-Zehnder Interferometers, Arrayed Waveguide Grating	1	T2	
17.	Acousto-Optic Tunable Filter, High Channel Count Multiplexer Architectures	1	T2	
18.	Optical Amplifiers- Erbium Doped Fiber amplifiers, Raman amplifiers	2	T2	
19.	Transmitters- LED, Lasers	2	T2	
20.	Direct and External Modulation	1	T2	
21.	Detectors- Photo detectors	1	T2	
22.	Optical Switches – Optical switch technologies	1	T2	
23.	Wavelength Converters –Optoelectronic Approach, Optical gating	1	T2	
Total periods required:		14		
UNIT -IV: MODULATION AND DEMODULATION				
24.	Signal formats for Modulation, Subcarrier Modulation and Multiplexing	1	T2	Capacity limits of optical fibers
25.	Optical Modulations – Duobinary, Single Side Band and Multilevel Schemes,	1	T2	
26.	Demodulation- Ideal and Practical receivers	1	T2	
27.	Bit Error Rates	2	T2	
28.	Coherent Detection, Timing Recovery and Equalization	2	T2	
29.	Reed-Solomon Codes for Error Detection and Correction	1	T2	
Total periods required:		8		
UNIT –V: OPTICAL NETWORKS				
30.	Access Networks - architecture overview, Enhanced HFC	1	T2	Packaging and cabling of photonic components, broadcast OTDM networks. Research Topic: Coherent Optical Systems
31.	Fiber to the curb(FTTC)	2	T2	
32.	Photonic packet switching	1	T2	
33.	OTDM-Bit, Packet Interleaving	2	T2	
34.	Optical AND gates	1	T2	
35.	Synchronization	1	T2	
36.	OTDM testbeds	1	T2	
37.	Deployment considerations- Designing the transmission layer using SDM, TDM, WDM, Unidirectional versus Bidirectional WDM systems.	1	T2	
Total periods required:		10		
Grand total periods required:		53		

Text Books:

T1: S.E.Miller, A.G.Chynoweth, *Optical Fiber Telecommunication*, 1979

T2: Rajiv Ramaswamy, Kumar N. Sivarajan and Galen H.Sasaki," *Optical Networks* ", Elsevier,Third edition,2010.

Reference Books:

R1. John. M. Senior, "*Optical fiber communications: Principles and Practice*", Pearson, Third edition, 2010.

R2: Gerd Kaiser, *Optical Fiber Communication*, McGraw Hill.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Lesson Plan

Name of the Subject: REAL TIME SYSTEMS (14MT23809)

Name(s) of the faculty Member(s) framing syllabus: P. Madhu Kumar

Class & Semester: M. Tech (DECS) II SEM. ELECTIVE-II

S. No.	Topic	No. of periods	Book(s) followed	Topics for Self Study
Unit I: Real Time Systems				
1.	Hard Vs Soft Real Time Systems	2	T1	Typical Real Time Applications
2.	Reference Model- Model characterization, Processors & Resources, Temporal Parameters of Real Time Workload	2	T1	
3.	Periodic Task Model-derivation for Utilization	1	T1	
4.	Precedence Constraints and Data Dependencies- Precedence and Task graphs	2	T1	
5.	Functional Parameters	1	T1	
6.	Resource Parameters	1	T1	
7.	Scheduling hierarchy	1	T1	
Total periods required:		10		
Unit II: Approaches to Real Time Scheduling				

8.	Clock driven Approach	1	T1	Rate Monotonic scheduling, Heuristic based scheduling approaches.
9.	Weighted round robin	1	T1	
10.	Priority driven	1	T1	
11.	Dynamic VS Static systems	2	T1	
12.	Effective release times and dead lines	1	T1	
13.	Optimality and Non-optimality of EDF and LST algorithms	1	T1	
14.	Challenges in Validating Timing Constraints in Priority Driven Systems	2	T1	
15.	Off line VS On line scheduling approaches	1	T1	
Total periods required:		10		
Unit III				
16.	Scheduling Real Time Tasks In Multiprocessor And Distributed Systems: Introduction to Multiprocessor and Distributed environments	1	T2	Triple Modular Redundant systems
17.	Multiprocessor task allocation	1	T2	
18.	Dynamic allocation of tasks	1	T2	
19.	Introduction to Fault Tolerant systems, Fault tolerant scheduling of tasks	2	T2	
20.	Clocks in distributed Real Time Systems	2	T2	
21.	Fault Tolerance Techniques: Terminology	1	T3	
22.	Failures- Causes, Types, Detection, Fault and Error Containment.	1	T3	
23.	Hardware redundancy	1	T3	
24.	Software, Time redundancy	1	T3	
25.	Integrated failure handling	1	T3	

Total periods required:		12		
Unit IV: Operating Systems				
26.	Overview-OS functions, Threads & tasks	2	T1	OS VS RTOS, Semaphores for Inter Task Communication, Semaphore Variants.
27.	Kernel-Structure of micro kernel	2	T1	
28.	Timing services and scheduling mechanisms	2	T1	
29.	Communication and Synchronization	1	T1	
30.	Event Notification and Software Interrupt Memory Management, I/O and Networking.	2	T1	
31.	Processor Reserves and Resource Kernel,	1	T1	
32.	Capabilities of Commercial Real Time Operating Systems.	1	T1	
Total periods required:		11		
Unit V: Commercial Real Time Operating Systems				
33.	UNIX as RTOS-non preemptive kernel, Dynamic Priority levels and deficiencies.	1		Open source RTOS
34.	Real Time Operating Systems- Extension to UNIX kernel, Host Target Approach, Preemption Point Approach, Self host systems.	2		Android OS fundamentals (Jellybean)
35.	Windows as RTOS- features of Windows NT, Shortcomings, Windows NT vs UNIX.	1		Research Topic: Firm Real Time Systems Characterization
36.	POSIX- Open software, Genesis of POSIX, Overview of POSIX, Real Time POSIX standard,	2		
37.	Survey of Contemporary Real Time Operating Systems- PSOS, VRTX, VXworks, QNX,	2		
38.	µC/OS-II, RT Linux, Lynx, Windows CE	2		
39.	Bench-marking Real Time Systems.	2		
Total periods required:		12		
Grand total periods required:		55		

Text Books:

Department of Electronics and Communication Engineering

T1: Jane W.S. Liu, "Real Time Systems", Pearson Education, I Edition, April 2000.

T2: Rajib Mall, "Real Time Systems-Theory and Practice", Pearson Education India, I Edition, Nov.2012.

T3: C. M. Krishna, Kang G Shin, "Real Time Systems", MCgraw-Hill Series, Dec. 1996.

Reference Books:

R1: Phillip A. Laplante and Seppo J. Ovaska, "Real-Time Systems Design and Analysis: Tools for the Practitioner", Wiley-IEEE Press, 4 edition, Nov. 2011.

R2: Hermann Kopetz, "Real-Time Systems: Design Principles for Distributed Embedded Applications ", Springer; 2nd Edition, 2011.

Signature(s) of the faculty Member(s)

Signature of the Chairman (BOS)

framing the syllabus

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(Autonomous)

Sree Sainath Nagar, A. Rangampet-517 102

Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: Testing and Testability of Digital Systems (14MT23804)

Class & Semester: M. Tech. (DECS) – II Semester

Name of the faculty Member: M.Naresh Babu

S. No.	Topic	No. of periods	Book (s) followed	Topics for self study
UNIT – I: BASICS OF TESTING AND FAULT MODELLING				
1.	Introduction to Testing	1	T1	Programs as functional models, delay modeling for functional elements, delay modeling in RTLs, combinational circuits, sequential circuits.
2.	Faults in digital circuits	1	T1	
3.	Modeling of faults	1	T1	
4.	Logical Fault Models	1	T1	
5.	Fault detection	1	T1	
6.	Fault location	1	T1	
7.	Fault dominance	1	T1	
8.	Logic Simulation, Types of simulation	1	T1	
9.	Delay models	1	T1	
10.	Gate level Event-driven simulation	1	T1	
Total periods required:		10		
UNIT – II: TEST GENERATION FOR COMBINATIONAL AND SEQUENTIAL CIRCUITS				
11.	Test generation for combinational logic circuits	2	T2	Fault Independent ATG, Random Test Generation, Test Generation Procedures.
12.	Testable combinational logic circuit design	2	T2	
13.	Test generation for sequential circuits	2	T2	
14.	design of testable sequential circuits	2	T2	
Total periods required:		08		
UNIT -III: DESIGN FOR TESTABILITY				
15.	Design for Testability	2	T1	Advanced Scan Concepts.
16.	Ad-hoc design for testability techniques	3	T1	
17.	Generic scan based design	2	T1	
18.	Classical scan based design	2	T1	
19.	System level DFT approaches	2	T1	
Total periods required:		11		
UNIT -IV: SELF-TEST AND TEST ALGORITHMS				

20.	Built-In Self Test	1	T1	Advanced BIST concepts, Algorithmic test generation.
21.	Test pattern generation for BIST	2	T1	
22.	Circular BIST	1	T3	
23.	BIST Architectures	3	T1	
24.	Testable Memory Design	2	T3	
25.	Test algorithms	2	T3	
26.	Test generation for Embedded RAMs	2	T3	
Total periods required:		13		
UNIT-V: FAULT DIAGNOSIS				
27.	Logic Level Diagnosis	2	T2	Diagnostic bit mapping. Research Topics: Advanced Scan Concepts.
28.	Diagnosis by UUT reduction	2	T2	
29.	Fault Diagnosis for Combinational Circuits	2	T2	
30.	Self-checking design	2	T2	
31.	System Level Diagnosis	2	T2	
Total periods required:		10		
Grand total periods required:		52		

TEXT BOOKS:

T1: M. Abramovici, M.A. Breuer and A.D. Friedman, "Digital Systems and Testable Design", Jaico Publishing House, 2002.

T2: P.K. Lala, "Digital Circuit Testing and Testability", Academic Press, 2002.

T3: A.L. Crouch, "Design Test for Digital IC's and Embedded Core Systems", Prentice Hall International, 2002.

REFERENCE BOOKS:

R1: M.L. Bushnell and V.D. Agrawal, "Essentials of Electronic Testing for Digital, Memory and Mixed Signal VLSI Circuits", Kluwer Academic Publishers, 2002.

Signature of the faculty Member

Signature of the Chairman (BOS)

SREE VIDYANIKETHAN ENGINEERING COLLEGE
(Autonomous)

Sree Sainath Nagar, A. Rangampet-517 102

Department of Electronics and Communication Engineering

Lesson Plan

Name of the Subject: Wireless Communications (14MT23805)

Class & Semester: M. Tech. (DECS & CMS) – II Semester

Name of the faculty Member: Dr. C. Subhas

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS AND CELLULAR CONCEPT				
1.	Evolution of Mobile Radio Communication Systems	1	T1	Mobile radio systems around the world, Wireless local loop, WLAN, Bluetooth and PANs, Handoff strategies.
2.	Examples of Wireless Communication Systems	1	T1	
3.	Wireless Cellular Networks and Standards – 1G	1	T1	
4.	2G	1	T1	
5.	2.5G	1	T1	
6.	3G	1	T1	
7.	Frequency Reuse Concept	1	T1	
8.	Channel Assignment Strategies		T1	
9.	Interference and System Capacity	2	T1	
10.	Trunking and Grade of Service	1	T1	
11.	Improving Coverage and Capacity in Cellular Systems - cell splitting and sectoring	1	T1	
Total periods required:		11		
UNIT – II: MOBILE RADIO PROPAGATION				
12.	Large Scale Path Loss: Introduction	1	T1	Simulation of Clarke's and Jake's models.
13.	Free Space Propagation Model		T1	
14.	Relating Power to Electric field	1	T1	
15.	Propagation Mechanisms – Reflection	2	T1	
16.	Diffraction and Scattering	1	T1	
17.	Practical Budget Design using Path Loss Models	1	T1	
18.	Outdoor Propagation Models	1	T1	
19.	Indoor Propagation Models	1	T1	
20.	Small Scale Fading and Multipath: Small Scale Multipath Propagation	1	T1	
21.	Impulse Response Model of a Multipath Channel	1	T1	
22.	Small Scale Multipath Measurements	1	T1	
23.	Parameters of Mobile Channels	1	T1	
24.	Types of Small Scale Fading (all variations)	1	T1	
25.	<i>Statistical Models</i> – Clarke's Model for Flat Fading	1	T1	
26.	Jake's Model	1	*	
Total periods required:		15		

UNIT -III: EQUALIZATION & DIVERSITY TECHNIQUES				
27.	Equalization: Introduction, Survey of Equalization Techniques	2	T1	Fundamentals of Equalization, Training a generic adaptive equalizer, Fractionally Spaced Equalizers.
28.	Linear Equalizers – Linear Transversal Equalizer		T1	
29.	Non-linear Equalizers - Decision Feedback Equalizer (DFE)		T1	
30.	Algorithms for Adaptive Equalization – Zero Forcing	2	T1	
31.	LMS		T1	
32.	RLS		T1	
33.	Diversity Techniques: Realization of Independent Fading Paths	1	T2	
34.	Receiver Diversity – System Model	1	T2	
35.	Selection Combining and Threshold Combining	1	T2	
36.	Maximal Ratio Combining and Equal Gain Combining	1	T2	
37.	Rake receiver	1	T1	
38.	Transmit Diversity–Channel known at Transmitter	1	T2	
39.	Channel unknown at Transmitter – the Alamouti Scheme, analysis.	1	T2	
Total periods required:		11		
UNIT – IV: MULTIPLE ACCESS TECHNIQUES & NETWORKING				
40.	Introduction to Multiple Access: FDMA, TDMA,	1	T1	FDD and TDD duplex techniques, Capture effect in packet radio, ISDN, SS7.
41.	CDMA and SDMA	1	T1	
42.	Packet Radio-Pure ALOHA, Slotted ALOHA	1	T1	
43.	CSMA, and reservation protocols.	1	T1	
44.	Capacity of Cellular Systems – Cellular CDMA	1	T1	
45.	Introduction to Wireless Networking: Introduction to Wireless Networks	1	T2	
46.	Differences between Wireless and Fixed Telephone Networks	1	T2	
47.	Development of Wireless Networks	1	T2	
48.	Traffic Routing in Wireless Networks	2	T2	
49.	Wireless Data Services	1	T2	
50.	Common Channel Signaling	1	T2	
Total periods required:		12		
UNIT – V: MULTICARRIER MODULATION				
51.	Data Transmission using Multiple Carriers	1	T2	Mitigation of subcarrier fading, IEEE 802.11a WLAN standard as case study. Research Topics: MIMO wireless Systems, Cognitive Radio.
52.	Multicarrier Modulation with Overlapping Subchannels	1	T2	
53.	Discrete Implementation of Multicarrier Modulation – DFT and its properties	1	T2	
54.	The Cyclic Prefix	1	T2	
55.	Orthogonal Frequency Division Multiplexing (OFDM)	1	T2	
56.	Matrix Representation of OFDM	1	T2	

57.	Vector Coding	1	T2	
58.	Challenges in Multicarrier Systems	1	T2	
Total periods required:		08		
Grand total periods required:		57		

*Handout will be given.

Text Books:

T1: T. S. Rappaport, "Wireless Communications, Principles and Practice," Prentice Hall, 2nd Edition, 2002.

T2: Andrea Goldsmith, "Wireless Communications," Cambridge University Press, 2005.

Reference Books:

R1: David Tse, Pramod Viswanath, "Fundamentals of Wireless Communications," University Press, 2006.

R2: Dr. Kamilo Feher, "Wireless Digital Communications," Prentice Hall, 1995.

**Signature of the faculty Member
framing the syllabus**

Signature of the Chairman (BOS)