SREE VIDYANIKETHAN ENGINEERING COLLEGE
(Autonomous)
Sree Sainath Nagar, A. Rangampet-517 102

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
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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 Cystal 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-Solom1on 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, 1 st Edition,1999.

T2: Bernard sklar, "Digital Communications – Fundamental and Application", Pearson Education, 2 nd 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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SREE VIDYANIKETHAN ENGINEERING COLLEGE
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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) framing the syllabus

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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. Polaiah

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 Bio logical Neural Network	1	T1 &T2	
3.	Typical Architectures and it's 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**		

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-:Cordinality 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

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. Sivaranjan 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.

Signature of the faculty Member framing the syllabus

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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 Android OS fundamentals (Jellybean) **Research Topic:** Firm Real Time Systems Characterization
34.	Real Time Operating Systems- Extension to UNIX kernel, Host Target Approach, Preemption Point Approach, Self host systems.	2		
35.	Windows as RTOS- features of Windows NT, Shortcomings, Windows NT vs UNIX.	1		
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:

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) 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: 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, Alorithmic 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.	*Statistical Models* – 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, PramodViswanath, "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)