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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Lesson Plan

Name of the Subject: Computer Architectures (14MT13801)

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

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

S. No.	Topic	No. of periods	Book(s) followed	Topics for Self Study
Unit I: Fundamentals of Computer Design				
1.	Architecture definition-ISA, Organization and Hardware to meet goals	1	T1	Pentium architecture features and pitfalls.
2.	Technology trends	2	T1	
3.	Trends in cost- cost of an IC, Cost VS Price	2	T1	
4.	Performance-measuring, reporting and summarization.	2	T1	
5.	Quantitative principles of computer design-Amdahl's law	2	T1	
6.	Processor performance equation	1	T1	
	Total periods required:	**10**		
Unit II: Instruction Level Parallelism				
7.	**ILP:** Concepts and challenges-various dependencies	1	T1	Performance analysis of Pentium 4.
8.	Compiler techniques for exposing ILP-Pipeline Scheduling & loop unrolling,	1	T1	
9.	Branch prediction – static. Dynamic- Tomasulo's Approach, Structure of MIPS FPU	2	T1	

10.	Speculation – Hardware speculation, MIPS FPU Extension to handle speculation.	2	T1	
11.	Exploiting ILP Using Multiple Issue and Static Scheduling Techniques	2	T1	
12.	Techniques for instruction delivery and speculation-branch prediction	2	T1	
13.	**ILP Limitations:** Hardware model, Window size & Maximum issue count, Branch prediction, finite register effects,	2	T1	
	Total periods required:	**12**		
Unit III: Multiprocessors and Thread Level Parallelism				
14.	**Introduction:** Taxonomy of Parallel Architectures-categorization of parallel architectures, Shared and distributed memory multiprocessors.	2	T1	Exploitation of thread level parallelism in modern processors. Simultaneous Multithreading, SMT vs TLP
15.	Memory Architecture and Communication models	1	T1	
16.	Parallel Processing Challenges	1	T1	
17.	**Symmetric shared memory architectures:**cache coherence, schemes for enforcing coherence, snooping protocols, limitations,	2	T1	
18.	**Distributed shared memory architectures:** Directory based coherence protocols	2	T1	
19.	Synchronization-hardware primitives, locks using coherency	2	T1	
20.	Models of memory consistency-sequential consistency, programmers view	2	T1	
	Total periods required:	**12**		
Unit IV: Memory Hierarchy Design				

21.	**Introduction:** Levels in Memory Hierarchy, basics of caching	2	T1	Multi level cache in Pentium and Pentium Pro processors
22.	Optimizations for Cache Performance	3	T1	
23.	**Memory Technology and Optimizations:** SRAM, DRAM with improved performance.	2	T1	
24.	**Protection:** Virtual Memory and Virtual Machines.	1	T1	
25.	**Design of Memory Hierarchies:** ISA, Speculative execution and memory system, I/O and consistency of cached data	3	T1	
	Total periods required:	**11**		
Unit V: Multiprocessor Interconnection Network				
26.	Interconnection Networks and their Taxonomy	1	T2	High Performance Networks **Research Topic:** Multi core interconnection networks
27.	**Bus based Dynamic Interconnection Networks:** Single bus & Multiple bus systems, bus synchronization,	2	T2	
28.	**Switch based Interconnection Networks:** Cross bar, Single stage, Multi stage,	3	T2	
29.	**Static Interconnection Networks:** Completely connected, Limited connection, Cube connected, Mesh connected networks,	2	T2	
30.	K-ary n-cube networks	1	T2	
31.	**Analysis and Performance Metrics:** dynamic and static networks.	2	T2	
	Total periods required:	**11**		
	Grand total periods required:	**55**		

Text Books:

T1: John L. Hennessey and David A. Patterson, “Computer architecture – A quantitative approach”, Morgan Kaufmann / Elsevier Publishers, 4th. Edition, 2007.
T2: Hesham El-Rewini, Mostafa Abd-El-Barr, “Advanced Computer Architecture and Parallel Processing”, A John Wiley & Sons, Inc Publication, 2005.

Reference Books:

R1: David E. Culler, Jaswinder Pal Singh, “Parallel computing architecture: A hardware/software approach”, Morgan Kaufmann /Elsevier Publishers, 1999.
R2: Kai Hwang and Zhi.Wei Xu, “Scalable Parallel Computing”, Tata McGraw Hill, New Delhi, 2003.

Signature(s) of the faculty Member(s) 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: COMPUTER NETWORKS(14MT13805)
Name(s) of the faculty Member(s) framing syllabus: Mr. R. Nagendra

Class & Semester: M. Tech I SEM.(DECS & CMS)

S. No.	Topic	No. of periods	Book(s) followed	Topics for Self Study
Unit I: Introduction to Computer Networks				
1.	Data communications & Networking for Today's Enterprise	1	T1	Client – Server model, Network components, Network standards and protocols.
2.	Data Communications	1	T1	
3.	Network Edge	1	T3	
4.	Network core	1	T3	
5.	Internet	1	T1	
6.	OSI Reference model	1	T1	
7.	TCP/IP models	1	T1	
8.	HDLC	2	T1, T2	
9.	Point to Point Protocol (PPP)	2	T1, T2	
	Total periods required:	**11**		
Unit II: Wired & Wireless LANs				
10.	Ethernet	1	T2	Multiple Access protocols
11.	FastEthernet	1	T2	
12.	Gigabit Ethernet	1		
13.	WLANS – Architecture and Services, Applications	1	T1	
14.	IEEE 802.11 WLAN Standard – Physical Layer	1	T1	
15.	MAC Layer, Frame structure	1	T1, T3	
16.	IEEE 802.11 a, b, g, e and n standards	1	T1	
17.	Bluetooth	2	T2	
18.	WiMax features	1	T1	
19.	standards, protocols and utility	1	T1	
20.	Virtual LANs	1	T1	
	Total periods required:	**12**		
Unit III: Advanced Network Architectures				
21.	Circuit switching network - SONET/SDH	2	T1	N-ISDN & B-ISDN Networks, X.25.
22.	Virtual Circuit Networks – Frame Relay	2	T1	
23.	ATM architectures and services	1	T1	
24.	ATM Layer	1	T1	
25.	ATM Adaptation Layer	1	T1	
26.	Signaling Protocols – MPLS	1	T1	
27.	RSVP	1	T1	
28.	VPN architecture	1	T2	

S. No.	Topic	No. of periods	Book(s) followed	Topics for Self Study
29.	IP over ATM	1	T1, T2	
30.	Repeaters& Bridges	1	T2	
31.	Routers &Gateways	1	T2	
	Total periods required:	**13**		
Unit IV:				
32.	IPv6 protocol	1	T1, T2	Internet protocol IPV4, P2P file sharing, Congestion control in circuit switching networks, Congestion Control in ATM
33.	TCP	1	T1, T2	
34.	UDP	1		
35.	Congestion control in TCP	1	T1, T2	
36.	Socket programing with TCP and UDP	1	T3	
37.	Web and HTTP	2	T3	
38.	FTP	1	T3	
39.	Simple Mail Transfer Protocol	1	T3	
40.	Domain Name System	1	T3	
41.	Multimedia Applications – RTP	1	T1, T3	
42.	Voice Over IP.	1	T1, T2	
	Total periods required:	**12**		
Unit V: Security in Computer Networks				
43.	Simple Network Management Protocol	1	T2	Routing algorithms in ATM/ TCP networks
44.	Network security	1	T3	
45.	Cryptography – Symmetric Key Cryptography	1	T3	
46.	Public Key Encryption	1	T3	
47.	Firewalls – Packet filtering	1	T3	
48.	Application Gateway	1	T3	
49.	Digital Signature	1	T2	
50.	IP Sec.	1	T2	
	Total periods required:	**08**		
	Grand total periods required:	**56**		

TEXT BOOKS:

T1. William Stallings, “Data and Computer Communication”, 9th edition, Prentice hall, 2010

T2. Behrouz A. Forouzan, “Data Communications and Networking”, 4th Ed, Tata McGraw-Hill, New Delhi, 2006

T3. Jim Kurose, Keith Ross, “Computer Networking: A Top Down Approach”, 4th edition, Addison Wesley, July 2007.

REFERENCE BOOKS:

R1. Andrew S. Tanenbaum “Computer Networks”, 4th Edition, Pearson Education, 2008

R2. LEON-GARCIA, INDRA WIDJAJA, “Communication Networks – Fundamental concepts and Key architectures”, TMH, 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: DIGITAL COMMUNICATION TECHNIQUES (14MT13802)
Class & Semester: M. Tech (DECS & CMS) – I Semester
Name of the faculty Member: M. Sivasubramanyam

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: Characterization Of Communication Signals And Systems				
1.	*Review of Random Variables and Processes*	4	T1	Representation of Band-Pass Stationary Stochastic Processes, Representation of Biorthogonal Signals, Simplex Signals and Signal waveforms from binary codes
2.	Representation of Band-Pass Signals	1	T1	
3.	Representation of Linear Band-Pass System, Response of a Band-Pass System to a Band-Pass Signal	1	T1	
4.	Signal Space Representations – Vector Space Concepts, Signal Space Concepts	1	T1	
5.	Orthogonal Expansion of Signals	2	T1	
6.	Representation of PAM Signals, Phase Modulated Signals	1	T1	
7.	Representation of QAM Signals, Multidimensional Signals, Orthogonal Multidimensional Signals	1	T1	
8.	Representation of Multidimensional Signals and Orthogonal Multidimensional Signals	1	T1	
9.	Power Spectra of Linearly Modulated Signals	2	T1	
Total periods required:		**10**		
UNIT – II: Digital Modulation Techniques				
10.	Factors that Influence digital modulation techniques	1	T2	Raised Cosine Roll off Filter, Gaussian Pulse-Shaping Filter, BFSK, M-ary FSK and OFDM.
11.	Bandwidth and Power Spectral Density of Digital Signals	1	T2	
12.	Linear Modulation Techniques–Introduction, BPSK	1	T2	
13.	DPSK	1	T2	
14.	QPSK	1	T2	
15.	OQPSK,	1	T2	
16.	∏/4 QPSK	1	T2	
17.	Constant envelope Modulation Techniques – Introduction, MSK	1	T2	
18.	GMSK	1	T2	
19.	Combined Linear and constant envelope modulation techniques – M-ary PSK	1	T2	
20.	M- ary QAM	1	T2	
Total periods required:		**11**		
UNIT -III: Optimum Receivers For Additive Gaussian Noise Channels				
21.	Optimum receiver for signals corrupted by AWGN – Correlation Demodulator	1	T1	Probability of M-ary Biorthogonal Signals, Simplex Signals and M-ary Binary-coded Signals, Comparison of Digital Modulation Method, Probability of Error for Envelope Detection of M-ary Orthogonal Signals and Correlated Binary Signals
22.	Matched Filter Demodulator	1	T1	
23.	Optimum Detector	1	T1	
24.	Performance of the optimum Receiver for Memory less Modulation – Probability of Error for Binary Modulation	1	T1	
25.	Probability of Error for M-ary Orthogonal Signals	1	T1	
26.	Probability of Error for M-ary PAM	1	T1	
27.	Probability of Error for m-ary PSK	1	T1	

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
28.	Probability of Error for QAM	1	T1	
29.	Optimum Receiver for Signals with Random Phase in AWGN Channel – Optimum Receiver for Binary Signals	1	T1	
30.	Optimum Receiver for M-ary Orthogonal Signals	1	T1	
Total periods required:		**10**		
UNIT – IV: Spread Spectrum Techniques				
31.	Introduction and Model of Spread Spectrum Digital Communication	1	T1	Digital Cellular CDMA System Based on DS Spread spectrum, A CDMA System Based on FH Spread Spectrum Signals
32.	Direct Sequence Spread Spectrum Digital Signals	2	T1	
33.	Processing Gain and Jamming Margin	1	T1	
34.	Applications of DS-Spread Spectrum Signals – Antijamming Application	1	T1	
35.	Low-Detectability Signal Transmission, Code Division Multiple Access	1	T1	
36.	Generation of PN-Sequences	2	T1	
37.	Frequency– Hopping Spread Spectrum Signals	1	T1	
38.	Other Types of Spread Spectrum Signals	1	T1	
Total periods required:		**10**		
UNIT – V: Detection Of Spread Spectrum Signals				
39.	Coherent Direct-Sequence Receivers	1	T3	Matched Filters with Acquisition-Aiding Waveforms **Research Area:** Spread Spectrum Communication System
40.	Delay-Lock Loop Analysis	1	T3	
41.	Tau-Dither Loop and Non Coherent Carrier Tracking	1	T3	
42.	Non coherent Frequency-Hop Receiver	1	T3	
43.	Acquisition of Spread-Spectrum Signals	1	T3	
44.	Acquisition by Cell-By-Cell Searching	1	T3	
45.	Reduction of Acquisition Time – Acquisition with Matched Filters	1	T3	
46.	Matched filters for PN Sequences	1	T3	
47.	Matched Filters for Frequency-Hopped Signals	1	T3	
Total periods required:		**09**		
Grand total periods required:		**50**		

TEXT BOOKS:

T1. John G. Proakis, “DIGITAL COMMUNICATIONS”, McGraw Hill, 4th edition, 2001.
T2. Theodore S. Rappaport, “Wireless Communications”, Pearson Education, 2nd edition, 2002.
T3. George R. Cooper & Clare D. McGillem, “Modern Communication and Spread Spectrum”, McGraw-Hill Book Company, 1986.

REFERENCE BOOKS:

R1. Marvin K. Simon, Jim K Omura, Robert A. Scholtz & Barry K.Levit, “Spread Spectrum Communications”, Computer Science Press, 1995.
R2. J.Marvin, K.Simon, Sami. M.Hinedi and William C. Lindsey, “Digital Communication Techniques”, PHI, 2009.

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Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: Digital System Design (14MT13803)
Class & Semester: M. Tech. (DECS) – I Semester
Name of the faculty Member: Ms. K. Sudha

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: DESIGN OF DIGITAL SYSTEMS				
1.	ASM charts	2	T1	Design of Serial Adder with Accumulator, Binary Divider, Parallel Multiplier.
2.	Hardware description language and control sequence method	1	T1	
3.	Reduction of state tables	2	T1	
4.	State assignments	1	T1	
5.	Design of Iterative circuits	2	T1	
6.	Design of sequential circuits - using ROMs and PLAs	1	T1	
7.	Design of sequential circuits - using CPLDs	1	T1	
8.	Design of sequential circuits – using FPGAs	1	T1	
Total periods required:		**12**		
UNIT – II: FAULT MODELING & TEST PATTERN GENERATION				
9.	Fault classes and models	2	T2	Basic Concepts of Fault-Tolerance Techniques.
10	Stuck at faults, bridging faults, transition and intermittent faults.	2	T2,R3	
11	Fault diagnosis of Combinational circuits by conventional methods – Path Sensitization technique	2	T2	
12	Boolean difference method	2	T2	
13	Kohavi algorithm	1	T2	
14	D – algorithm	2	R3	
15	PODEM	1	R3	
16	Random testing	1	R3	
17	Transition count testing	1	R3	
18	Signature Analysis	1	R3	
19	Testing for bridging faults	2	T3	
Total periods required:		**17**		
UNIT -III: FAULT DIAGNOSIS IN SEQUENTIAL CIRCUITS				
20	Circuit Test Approach	2	R1	Problems and Solutions for fault detection.
21	Transition Check Approach - State identification	3	R1	
22	Fault detection experiment.	2	R1	
23	Machine identification	1	R1	
24	Design of fault detection experiment	2	R1	

Total periods required:		**10**		
UNIT – IV: PLA MINIMIZATION AND TESTING				
25	PLA minimization	2	T2,T3	Design For Testability(DFT) Schemes, Built-In Self-Test.
26	PLA folding	3	T2	
27	Fault model in PLA	1	T2,T3	
28	Test generation	2	T2,T3	
29	Testable PLA design	2	T3	
Total periods required:		**10**		
UNIT – V: ASYNCHRONOUS SEQUENTIAL MACHINES				
30	Fundamental mode model	1	R2	The Finite State Model – Capabilities and limitations, State equivalence and machine minimization. **Research Topics:** Self Reconfigurable Digital Circuits
31	The Flow table	1	R2	
32	Reduction of incompletely specified machines	3	R2	
33	Races, cycles and hazards	2	R2	
Total periods required:		**7**		
Grand total periods required:		**56**		

TEXTBOOKS:

T1: Charles H. Roth, Jr., "Fundamentals of Logic Design ", Cengage Learning, 5th edition,2004.

T2: N. N. Biswas, "Logic Design Theory", PHI,1993.

T3: Miron Abramovici, Melvin Breuer, Arthur Friedman, "Digital Systems Testing and Testable Design", Jaico Publishing House, 2001.

REFRENCES:

R1: Samuel C. Lee," Digital Circuits and Logic Design, PHI,1976.

R2: Norman Balabanian, Bradley Carlson, "Digital Logic Design Principles", John Wily&Sons,Inc., 2002.

R3: Parag K. Lala," Fault Tolerant and Fault Testable Hardware Design", BS Publications,1990.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Lesson Plan

Name of the Subject: EMBEDDED SYSTEM DESIGN (14MT13807)

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

K.V. Rajendra Prasad

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

S. No.	Topic	No. of periods	Book(s) followed	Topics for Self Study
Unit I: An Introduction to Embedded Systems				
1.	Embedded systems-definition, how are they different	2	T1	Embedded Design Life Cycle
2.	Challenges in Embedded Computing System Design	1	T1	
3.	Processor Embedded into a System, Selection Process	2	T1	
4.	Hardware Units and Devices in a System	1	T1	
5.	Exemplary Embedded Systems	2	T1	
6.	Embedded System -On-Chip (SOC) and use of VLSI Circuit Design Technology	1	T1	
7.	Classification of Embedded Systems	1		
	Total periods required:	**10**		
Unit II				
8.	**Processor Architectures, Memory Organization and Real World Interfacing:**	2	T1	Examples

	Advanced Architectures			illustrating software architectures for bridge, Multimeter.
9.	Processor and Memory Organization, Performance Metrics	2	T1	
10.	Memory-Types, Maps and Addresses, Processor and Memory Selection.	2	T1	
11.	**Survey of Software Architectures:** Round-Robin	1	T2	
12.	Round- Robin with Interrupts	1	T2	
13.	Function-Queue Scheduling	2	T2	
14.	Real-Time Operating System Architectures	1	T2	
15.	Selecting Architecture	1	T2	
Total periods required:		**12**		
Unit III: Programming Concepts and Embedded Programming in C, C++, VC++ and JAVA				
16.	Software Programming in Assembly language and in High-Level languages	1	T1	ARM, SHARC architectures and their instruction sets.
17.	C Program Elements- Header, Source Files and Preprocessor Directives	2	T1	
18.	Macros and Functions	1	T1	
19.	Data Types	2	T1	
20.	Data Structures, Modifiers	2	T1	
21.	Statements, Loops and Pointers	1	T1	
22.	Embedded Object-Oriented Programming	1	T1	
23.	Introduction to programming in C++, Java	1	T1	
Total periods required:		**11**		
Unit IV: Processes and Operating Systems				
24.	Introduction	1	T3	Comparison of RTOS to General Purpose OS, Kernel Services.
25.	Multiple Tasks and Processes	2	T3	
26.	Pre-emptive RTOS	2	T3	
27.	Priority Based Scheduling	2	T3	

28.	Inter process Communication Mechanisms	1	T3	Design example: Telephone Answering Machine.
29.	Evaluation OS Performance	1	T3	
30.	Power Management and Optimization for Processes	2	T3	
	Total periods required:	**11**		
	Unit V			
31.	**Embedded Software Development TOOLS:** Host and Target Machines	2	T2	Debugging techniques **Research Topic:** Real Time System Characterization
32.	Linkers/Locators for Embedded Software	1	T2	
33.	Getting Software into the Target System	1	T2	
34.	**System Design Techniques:** Introduction, Design Methodologies,	2	T3	
35.	Requirement Analysis	2	T3	
36.	Specifications	1	T3	
37.	System Analysis and Architecture Design	2	T3	
	Total periods required:	**11**		
	Grand total periods required:	**55**		

Text Books:

T1: Rajkamal, “Embedded systems: Architecture, Programming and Design”, TMH, Second Edition,2008.

T2: David E. Simon, “An embedded software primer”, Pearson Education , 2008
T3: Wayne wolf, “Computers as a component: principles of embedded computing system design”, Morgan Kaufmann Publishers , Second Edition,2008.

Reference Books:

R1: Arnold S Burger, “Embedded Systems Design: An Introduction to Processes, Tools, and Techniques”, CMP Books
R2: Steve Heath, Butterworth Heinenann, “Embedded systems design: Real world design”, Newton mass USA 2002.

Signature(s) of the faculty Member(s) framing the syllabus **Signature of the Chairman (BOS)**

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Lesson Plan

Name of the Subject: Linear Algebra (14MT13831)
Name of the faculty Member:
Class & Semester: M. Tech. I Semester (CMS & DECS) **Section:** -

S. No.	Topic	No. of periods required	Book(s) followed	Topics for self study
Unit-I: VECTORS AND LINEAR EQUATIONS				
1.	System of linear equations	1	T1,T2	Gauss Elimination method
2.	Vector equations	1	T1,T2	
3.	The matrix and vector equations AX=B and AX=0	2	T1,T2	
4.	Solution sets of linear system	2	T1,T2	
5.	Linear combinations , Linear dependence and independence of vectors	1	T1,T2	
6.	Solutions of equations using LU decomposition	2	T1,T2	
	Total of periods required:	**9**		
Unit-II: VECTOR SPACES AND LINEAR TRANSFORMATIONS				
7.	Vector spaces and subspaces	1	T1,T2	Change of basis
8.	Null and column Spaces of a matrix	1	T1,T2	
9.	Bases, Coordinate systems	1	T1,T2	
10.	Dimension of a Vector Space	1	T1,T2	
11.	Linear transformation, Properties of linear transformations	2	T1,T2	
12.	Rank and Nullity	2	T1,T2	
13.	Matrix of linear transformations	2	T1,T2	
	Total of periods required:	**10**		
Unit-III: INNER PRODUCT SPACES				
14.	Inner product, Norm	1	T1,T2	Sylvester's law of inertia, positive definiteness.
15.	Inner product space,	2	T1,T2	
16.	Othrogonality	1	T1,T2	
17.	Orthogonal sets	1	T1,T2	
18.	Ortho normal basis	2	T1,T2	
19.	Orthogonal projections	1	T1,T2	
20.	Gram-Schmidt orthogonalisation process	2	T1,T2	
	Total of periods required:	**10**		
Unit-IV: EIGEN VALUES AND EIGEN VECTORS				
21.	Eigen Values and Eigen Vectors of a matrices	2	T1,T2	Hermitian, skew Hermitian and Unitary matrices
22.	Eigen Values and Eigen Vectors of linear transformations	1	T1,T2	

23.	Eigen values and Eigen vectors of complex matrices	2	T1,T2	Eigen filters
24.	Diagonalisation,	2	T1,T2	
25.	Quadratic forms- Nature	2	T1,T2	
26.	Orthogonality of symmetric matrices	1	T1,T2	
27.	Singular value decomposition (SVD).	2	T1,T2	
	Total of periods required:	**12**		
Unit-V: ENGINEERING APPLICATIONS OF LINEAR ALGEBRA				
28.	Applications to Difference equations- Discrete-time signals	3	T1	Network flows
29.	Linear Independence in the space signals	2	T1	
30.	Applications to Decoupling a dynamical system	3	T1	
31.	Complex Eigen Values in Decoupling systems	3	T1	
32.	Applications of inner product spaces to Fourier Series Analysis.	3	T1	
	Total of periods required:	**14**		
	Grand total of periods required:	**55**		

TEXT BOOKS:

T1. David C. Lay, **Linear Algebra and its applications**, Fourth edition, Pearson education, India. (2014).

T2.Jim DeFramza and Dan Gagliardi **Introduction to Linear Algebra with applications,** The McGraw. Hill Companies, India. (2012)

REFERENCE BOOKS:

R1. Gilbert Strang, **Introduction to Linear Algebra**, Fourth edition, South Asian edition, Cambridge Press. (2009).

R2. Otto Bretscher , **Linear Algebra with applications**, Third edition, Pearson education, India. (2007)

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Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: LOW POWER CMOS VLSI (14MT13806)
Class & Semester: M. Tech. (DECS) – I Semester
Name of the faculty Member: M.BHARATHI

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: Power Dissipation in CMOS VLSI design:				
1.	Need for low power VLSI chips	1	T1	Power dissipation in CMOS-short circuit dissipation, dynamic dissipation, Load Capacitance
2.	Sources of Power dissipation	1	T1	
3.	Power dissipation in MOS Devices	1	T1	
4.	Power dissipation in CMOS Devices	1	T1	
5.	Limitations of low Power design	1	T1	
Total periods required:		**5**		
UNIT – II: Power Estimation:				
6.	Modeling of Signals	1	T1	Power dissipation in Domino CMOS, Circuit Reliability, Power Estimation at circuit level, High level power estimation, Information Theory based approaches.
7.	Signal Probability Calculation	1	T1	
8.	Probabilistic Techniques for Signal activity Estimation	2	T1	
9.	Statistical Techniques	2	T1	
10.	Estimation of Glitching Power	1	T1	
11.	Sensitivity Analysis	1	T1	
12.	Power Estimation using input vector Compaction	2	T1	
13.	Estimation of Maximum Power	2	T1	
Total periods required:		**12**		
UNIT -III: Synthesis for Low Power & Design and Test of Low Voltage CMOS Circuits				
14.	Behavioral Level Transforms	4	T1	Testing deep submicron IC's with Elevated Intrinsic Leakage, Key to Minimizing SCE
15.	Logic Level optimization of low power	1	T1	
16.	Circuit level	2	T1	
17.	Circuit Design Style	2	T1	
18.	Leakage current in Deep Sub micrometer Transistors	1	T1	
19.	Low voltage Circuit Design Techniques	2	T1	

20.	Multiple Supply Voltages	1	T1	
Total periods required:		**13**		
UNIT -IV: Low Power Static RAM Architectures				
21.	Organization of Static RAM	2	T1	Reducing power in the write driver circuits, Method for achieving low core voltages from a single supply
22.	MOS Static RAM Memory Cell	3	T1	
23.	Banked Organization of SRAMs	1	T1	
24.	Reducing Voltage Swing in Bit lines	2	T1	
25.	Reducing Power in Sense Amplifier Circuits	2	T1	
Total periods required:		**10**		
UNIT -V: Low Energy Computing using Energy Recovery Techniques & Software design for low power				
26.	Energy Recovery Circuit Design	1	T1	Energy dissipation in transistor channel using an RC Model, Automated low power code generation. **Research Topics:** Current Reference Precharging Techniques for Low Power Zero Crossing Pipeline SAR ADC.
27.	Designs with partially Reversible logic	4	T1	
28.	Supply Clock Generation	1	T1	
29.	Sources of software power Estimation	2	T1	
30.	software power Optimizations	2	T1	
31.	Co-design for low power	2	T1	
Total periods required:		**12**		
Grand total periods required:		**52**		

TEXT BOOKS:

1. Kaushik Roy, Sharat Prasad, "Low-Power CMOS VLSI Circuit Design" Wiley Student Edition,2000.

REFERENCE BOOKS:

1. Kiat-Seng Yeo,Samir S.Rofail and Wang-Ling Goh, "CMOS/BiCMOS ULSI:Low power ,Low Voltage ",Pearson education,2002.

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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: Modern Digital Signal Processing (14MT13804)

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

Name of the faculty Member: Ms. D. Leela Rani

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I: MULTIRATE FILTER BANKS				
1.	Decimation, Interpolation	1	T1	Discrete Wavelet Transform
2.	Sampling rate conversion by a rational factor I/D	2	T1	
3.	Multistage Implementation of sampling rate conversion	1	T1	
4.	**Digital Filter Banks:** Two-Channel Quadrature-Mirror Filter Bank,	2	T1	
5.	Elimination of aliasing, condition for Perfect Reconstruction	1	T1	
6.	Polyphase form of QMF bank,	1	T1	
7.	Linear phase FIR QMF bank, IIR QMF bank	2	T1	
8.	Perfect Reconstruction Two-Channel FIR QMF Bank	2	T1	
Total periods required:		**12**		
UNIT II: POWER SPECTRAL ESTIMATIONS				
9.	Estimation of spectra from finite duration observation of signals	2	T1	Correlation: auto and cross correlation and their properties. Spectrum and its properties
10.	**Non-Parametric Methods**: Bartlett,	1	T1	
11.	Welch	1	T1	
12.	Blackmann & Tukey methods	1	T1	
13.	Performance Characteristics of Nonparametric Power Spectrum Estimators,	1	T1	
14.	Computational Requirements of Nonparametric Power Spectrum Estimates	1	T1	
15.	**Parametric Methods:** Relation between auto correlation & model parameters	1	T1	
16.	Yule-Waker	1	T1	
17.	Burg Methods	1	T1	
18.	MA & ARMA models for power spectrum estimation	2	TI	
Total periods required:		**12**		
UNIT – III: DEVELOPMENT OF ADAPTIVE FILTER THEORY & SEARCHING THE PERFORMANCE SURFACE				
19.	Introduction to Filtering, Smoothing and Prediction, Problem statement	1	T2	Three basic kinds of Estimation , linear optimum filters
20.	Linear Optimum Filtering	1	T2	
21.	Principle of Orthogonality - Minimum	1	T2	

	Mean Square Error			
22.	Wiener- Hopf equations	1	T2	
23.	Error Performance - Minimum Mean Square Error	1	T2	
24.	Methods & Ideas of Gradient Search methods, & its Solution	2	R1	
25.	Gradient Searching Algorithm	1	R1	
26.	Stability & Rate of convergence	1	R1	
27.	Learning Curves	1	R1	
	Total periods required:	**10**		
UNIT -IV: STEEPEST DESCENT ALGORITHMS, LMS ALGORITHM & APPLICATIONS				
28.	Gradient Search by Newton's Method	1	R1	Characterization of the Autoregressive process
29.	Method of Steepest Descent	1	R1	
30.	Comparison of Learning Curves	1	R1	
31.	**LMS Algorithm:** Overview - LMS Adaptation algorithms	1	T2	
32.	Stability & Performance analysis of LMS Algorithms	2	T2	
33.	LMS Gradient & Stochastic algorithms	1	T2	
34.	**Applications:** Noise cancellation	1	T2	
35.	Cancellation of Echoes in long distance telephone circuits	1	T2	
36.	Adaptive Beam forming	1	T2	
	Total periods required:	**10**		
UNIT – V: RLS ALGORITHM AND KALMAN FILTERING				
37.	**RLS Algorithm :** Matrix Inversion lemma, exponentially weighted recursive least square algorithm	2	T2	Regularization, Recursive computation of time average correlation matrix **Research Topics:** Speech and video processing , Source and channel coding/decoding, RADAR, LIDAR, Equalization.
38.	update recursion for the sum of weighted error squares	2	T2	
39.	convergence analysis of RLS Algorithm	2	T2	
40.	Application of RLS algorithm on Adaptive Equalization	2	T2	
41.	**Kalman Filtering:** Introduction, Recursive Mean Square Estimation Random variables	1	T2	
42.	The Innovations Process	1	T2	
43.	Estimation of the state using the Innovations Process	1	T2	
44.	Filtering, Initial conditions	2	T2	
	Total periods required:	**13**		
	Grand total periods required:	**57**		

TEXT BOOKS:

T1. John G. Proakis, Dimitris G. Manolakis, "*Digital Signal Processing, Principles, Algorithms and Applications"*, Prentice Hall, 4th Edition, 2007.

T2. Simon Haykin, "*Adaptive Filter Theory*", 4th Edition, PE Asia, 2002.

REFERENCE BOOKS:

R1. Bernard Widrow, Samuel D. Strearns, "*Adaptive Signal Processing*", PE, 1985.

R2. Emmanuel C Ifeacher Barrie. W. Jervis, "*DSP-A Practical Approach*", Pearson Education, 2nd Edition, 2002.

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

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Lesson Plan

Name of the Subject: Research Methodology (14MT10310)
Name of the faculty Member:
Class & Semester: M. Tech. - I Semester **Section:**

S. No.	Topic	No. of periods required	Book(s) followed	Topics for self study
Unit-I: Introduction to Research Methodology				
1.	Research objective and Motivation	1	T1	Problems encountered by researchers.
2.	Types of Research –Descriptive vs Analytical, Applied vs Fundamental, Quantitative vs Qualitative, Conceptual vs Empirical	1	T1	
3.	Research Approaches	1	T1	
4.	Research and Scientific Methods	1	T1	
5.	Research Process	2	T1	
6.	Criteria of Good Research	1	T1	
	Total of periods required:	**7**		
Unit-II: Research Problem and Design				
7.	What is Research Problem?	1	T1	Experimental designs. Developing research plan.
8.	Selecting the Problem	1	T1	
9.	Necessity of Defining the Problem	1	T1	
10.	Techniques involved in Defining a Problem	2	T1	
11.	What is Research Design? Its need and features	1	T1	
12.	Important concepts of Research Design	1	T1	
13.	Designing Methods: Research design in case of exploratory research studies, Research design in case of descriptive and diagnostic research studies, Research design in case of hypothesis-testing research studies	2	T1	
	Total of periods required:	**9**		
Unit-III: Data Collection, Analysis, and Hypothesis				
14.	Collection of Primary Data: Observation Method, Interview Method, Questionnaires, Schedules, Other Methods	1	T1	Guidelines for constructing questionnaires and interviews.
15.	Collection of Secondary Data	1	T1	
16.	Selection of Appropriate Method for Data Collection	1	T1	
17.	Processing Operations: Editing, Coding, Classification and Tabulation	2	T1	
18.	Types of Analysis	1	T1	
19.	What is Hypothesis? Basic Concepts of Testing Hypothesis: Null hypothesis and alternative hypothesis, Level of significance,	2	T1	

	Decision rule, Type I and Type II errors, Two-tailed and One-tailed tests			
20.	Hypothesis Testing Procedure	1	T1	
	Total of periods required:	**9**		
Unit-IV: Statistics in Research				
21.	Review of Statistical Techniques: Mean, Median, Mode	1	T1	Simple regression analysis.
22.	Geometric Mean, Harmonic Mean, Variance, Standard Deviation	1	T1	
23.	Measure of Asymmetry	1	T1	
24.	Normal Distribution	2		
25.	Chi-Square as a Test for Comparing Variance	1	T1	
26.	Steps Involved in Applying Chi-Square Test	1	T1	
27.	Problems	2		
	Total of periods required:	**9**		
Unit-V: Interpretation and Report Writing				
28.	Interpretation: Meaning, Importance	1	T1	Mechanics of writing research report.
29.	Interpretation: Techniques and Precautions	1	T1	
30.	Report Writing: Significance and Different Steps	2	T1	
31.	Types of Reports	1	T1	
32.	Precautions in Report Writing	1	T1	
	Total of periods required:	**6**		
	Grand total of periods required:	**40**		

Text Book:

T1. C.R. Kothari, *Research Methodology: Methods and Techniques*, New Age International Publishers, New Delhi, 2nd Revised Edition, 2004.

Reference Books:

R1. Ranjit Kumar, *Research Methodology: A step-by-step guide for beginners*, Sage South Asia, 3rd ed., 2011.

R2. R. Panneerselvam, Research Methodology, PHI learning Pvt. Ltd., 2009

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SREE VIDYANIKETHAN ENGINEERING COLLEGE

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Sree Sainath Nagar, A. Rangampet-517 102

Department of Electronics and communication Engineering

Lesson Plan

Name of the Subject: Transform Techniques (14MT13808)
Class & Semester: M. Tech. (CMS & DECS) – I Semester
Name of the faculty Member: Mr. K. V Koteswara Rao

S. No.	Topic	No. of periods	Book(s) followed	Topics for self study
UNIT – I				
1.	**Review of Transforms**: Vector space, functions and function spaces	1	T2	Parseval's Identity for the CWT, Inverse CWT as a many-to-One Operation.
2.	Fourier transform	2	T2	
3.	Short-Time Fourier Transform	2	T2	
4.	Walsh, Hadamard, Haar	1	R1	
5.	Slant, KLT, Hilbert transforms	1	R1	
6.	**Continuous Wavelet Transform:** Introduction, Continuous-Time Wavelets	1	T1	
7.	Definition of the CWT	1	T1	
8.	The CWT as a correlation	1	T1	
9.	Constant Q-Factor Filtering Interpretation and Time-Frequency Resolution	2	T1	
10.	The CWT as an operator	1	T1	
11.	Inverse CWT	1	T1	
Total periods required:		**14**		
UNIT -II: DISCRETE WAVELET TRANSFORM AND ORTHOGONAL WAVELET DECOMPOSITION				
12.	Introduction	1	T1	Regularity and convergence, Band limited Bi-orthogonal Decomposition, Design and Selection of Wavelets.
13.	Approximations of vectors in nested linear vector spaces	1	T1	
14.	Example of an MRA-Bases for the Approximation Subspaces and Harr Scaling Function	2	T1	
15.	Bases for the Detail Subspaces and Harr Wavelet	2	T1	
16.	Digital Filter Implementation of the Harr Wavelet Decomposition	2	T1	
Total periods required:		**08**		
UNIT -III: MRA ORTHONORMAL WAVELETS, AND THEIR RELATIONSHIP TO FILTER BANKS				
17.	Introduction	1	T1	Daubechies construction of Orthonormal Scaling
18.	Formal Definition of an MRA	1	T1	
19.	Construction of a General Orthonormal	2	T1	

	MRA			Functions.
20.	A Wavelet basis for MRA	2	T1	
21.	Digital Filtering Interpretation	1	T1	
22.	Examples of Orthogonal Basis Generating Wavelets	1	T1	
23.	Interpreting Orthonormal MRAs for Discrete time signals	2	T1	
24.	Miscellaneous issues Related to PRQMF Filter Banks	1	T1	
25.	Generating Scaling Functions and Wavelets from Filter Coefficients	1	T1	
Total periods required:		**12**		
UNIT – IV: ALTERNATIVE WAVELET REPRESENTATIONS				
26.	Bi-orthogonal Wavelet Bases	2	T1	M-Band Wavelets, Lifting Scheme.
27.	Filtering Relationship for Bi-orthogonal Filters	1	T1	
28.	Examples of Bi-orthogonal Scaling Functions and Wavelets	1	T1	
29.	Two-Dimensional Wavelets	2	T1	
30.	Non-separable Multidimensional Wavelets	1	T1	
31.	Wavelet Packets	2	T1	
Total periods required:		**09**		
UNIT – V: APPLICATIONS OF WAVELETS				
32.	Wavelet De-noising	2	T1	Wavelets in Boundary Value Problems. **Research Topics:** Adaptive Wavelet Transforms, Stationary Wavelet Transforms, Cycle Wavelet Transforms.
33.	Speckle Removal	1	T1	
34.	Edge Detection and Object Isolation	2	T1	
35.	Image Fusion	2	T1	
36.	Object Detection by Wavelet Transforms of Projections	1	T1	
37.	Scaling Functions as signaling pulses	2	T1	
38.	Discrete Wavelet Multitone Modulation	1	T1	
Total periods required:		**11**		
Grand total periods required:		**54**		

Text Books:

T1: Raghuveer M.Rao and Ajit S.Bopardikar, "*Wavelet Transforms-Introduction to theory and applications*", Pearson edu, 1998.

T2: Soman.K.P, Ramachandran.K.I, Resmi.N.G, "*Insight into Wavelets from theory to Practice"*, PHI, Third Edition, 2010.

Reference Books:

R1. R. C. Gonzalez, R. E. Woods, "*Digital Image Processing*," 2nd Edition, Pearson Education, 1992.

R2: Jaideva C Goswami, Andrew K.Chan, "*Fundamentals of Wavelets-Theory, Algorithms and Applications"*, John Wiley and sons, 1999.

R3: C.Sidney Burrus, Ramesh A Gopinath and Haitao Guo, "*Introduction to Wavelets and Wavelet Transforms"*, Prentice Hall, 1998.

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