B

Accredited By NAAC

SHIVAJI UNIVERSITY, KOLHAPUR.

Revised Syllabus of

(B.E. Electronics & Telecommunication Engineering

Sem –VII & VIII)

To be introduced from the academic year 2010-11

(i.e. from June 2010) Onwards

(Subject to the modifications will be made from time to time)

B.E. (ELECTRONICS & TELECOMMUNICATION ENGG.) (Sem VII)

SR.NO	SUBJECT	TEACHING SCHEME				EXAM.SCHEME				
		L	T	P	Total	Paper	TW	POE	OE	Total
1.	Computer Communication Network	4	-	2	6	100	25	--	50	175
2.	Wireless Communication	4	-	-	4	100	25	-	-	125
3.	Microwave Engineering	4	-	2	6	100	25	-	50	175
4.	Embedded Systems	4	-	2	6	100	25	50	-	175
5.	Elective-I	4	-	-	4	100	-	-	-	100
6.	Project	-	-	4	4	-	50	-	-	50
	TOTAL	20	-	10	30	500	150	50	100	800

B.E. (ELECTRONICS & TELECOMMUNICATION ENGG.) (Sem VIII)

SR.NO	SUBJECT	TEACHING SCHEME				EXAM.SCHEME				
		L	T	P	Total	Paper	TW	POE	OE	Total
1.	Audio & Video Engg.	4	-	2	6	100	25	50	-	175
2.	Broadband Communication	4	-	2	6	100	25	--	--	125
3.	Image Processing	4	-	2	6	100	25	-	50	175
4.	Elective-II	4	-	-	4	100	25	-	-	125
5.	Project	-	-	8	8	-	100	-	100	200
	TOTAL	16	-	14	30	400	200	50	150	800

[Note :- Examination scheme and term work marks strictly as per above structure]

B.E. (ELECTRONICS & TELECOMMUNICATION ENGG.) 2010-11

B.E. Part-I

Elective-I

1. Digital Signal Processors
2. Integrated Communication Systems
3. Satellite Communication
4. Remote sensing & GIS

B.E. Part-II

Elective-II

1. Speech Processing
2. Pattern Recognition
3. Mobile Communication
4. Real time Systems

B.E.(Electronics and Telecommunication)

1. Subject : Computer Communication Network

w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
Practical : 2 hrs / week **TW : 25 Marks**
OE: 50 Marks

SECTION – I

1) Introduction to computer networks **5 Hrs**

Network definition & requirements Network topology, Types of networks, Network Software issues, reference models – OSI,TCP/IP.

2) Physical Layer –Transmission media **8 Hrs**

Guided media-twisted pair, coaxial cable, optical fiber. Unguided media – RF allocation, terrestrial microwave, satellite communication, cellular telephone. EIA 232 D interface standard, Modems – types, block schematic & standards Network Devices: Network Connectors, Hubs, Switches, Routers,BridgesNIC.

3) Data Link Layer **7 Hrs**

Design issues, error detection and correction, elementary data link protocols, sliding window protocols. HDLC – types of stations, modes of operation, HDLC frame formats, additional features. Medium Access Sublayer – Channel allocation problem, multiple access Protocols, IEEE standard 802 for LANs and WANs

SECTION-II

4) High speed Ethernet **5 Hrs**

Fast Ethernet physical layer, Fast Ethernet networks, Gigabit Ethernet

5) Network Layer **6 Hrs**

Design issues, Routing algorithms – shortest path, distance vector routing, link state routing, flow based routing, routing for mobile hosts, Congestion control – congestion prevention policies-leaky bucket algorithm, token bucket algorithm, congestion control in virtual circuit subnet and choke packets.

6) TCP/IP Protocol Suit Overview **9 Hrs**

TCP/IP and Internet, IP protocol and it's header format, addressing, subnetting, other network layer protocols – ARP, RARP, ICMP, IGMP, TCP, UDP, Domain name system (DNS), IP/V.6

Referances :

1. Data Communication and Networking Forouzan-IInd edition
2. Computer Neworks Tanenbaum
3. Computer Networks Natalia olifer, Victor olifer
4. Computer Networks Mrs. Shinde S. S. New age International pub.

Note: Any 10 experiments based on above syllabus.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

2. Subject : Wireless Communication
w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
TW : 25 Marks

SECTION I

1. Review: 2G, 3G wireless networks, WLL, Cellular Concept **6 Hrs.**

2. Mobile Radio Propagation **7 Hrs.**

Large Scale Path Loss: Introduction to Radio Wave propagation, Free Space propagation model, Relating Power to Electric Field, The three Basic Propagation Mechanisms, Reflection, Ground Reflection (Two-Ray) Model, Diffraction, Scattering, Practical Link Budget Design Using Path Loss Models, Outdoor Propagation Models, Indoor Propagation Models, Signal Penetration into Buildings, Ray Tracing And Site Specific Modeling,

3. Mobile Radio Propagation **7 Hrs.**

Small-Scale Fading and Multipath : Small-Scale Multipath Propagation, Impulse Response Model of a Multipath Channel, Small-Scale Multipath Measurements, Parameters of Mobile Multipath Channels, Types of small-Scale Fading, Rayleigh and Ricean Distributions, Statistical Models for Multipath Fading Channels.

SECTION II

4. Multi Access Technique for wireless communication **6 Hrs.**

Introduction, Frequency Division multiple Access (FDMA), Time Division Multiple Access (TDMA) Spread Spectrum Multiple Access, Space Division Multiple Access (SDMA) Packet Radio, Capacity of cellular Systems,

5. Wireless Networking: Introduction to wireless Networks **7 Hrs.**

Difference Between Wireless and Fixed Telephone Networks, Development of Wireless Networks, Fixed Network Transmission Hierarchy, Traffic Routing in Wireless Networks, Wireless Data Services, Common Channel Signaling (CCS), Integrated services Digital networks (ISDN), Signaling System No. 7 (SS7), An Example of SS7-Global Cellular Network Interoperability, Personal Communication services / Networks (PCS/PCNs), protocols for Network Access, Network Databases, Universal Mobile Telecommunication System (UMTS.

6. Wireless Systems & Standards **7 Hrs.**

AMPS and ETACS, United States Digital Cellular (IS-54 ad IS-136) Global System for Mobile (GSM) CDMA digital Cellular Standard (IS-95), CT2 standard for cordless Telephones, Digital European Cordless Telephones (DECT) PACS- Personal Access Communication Systems, Pacific Digital Cellular (PDC), Personal Handy phone System (PHS), US PCS and ISM Bands, US wireless Cable Television, Summary Of Standards throughout the world, problems. IEEE 802.11

Reference Books

1. Wireless Communications Principals & Practice- Theodore S. Rappaport, (P.E.)

2. Wireless & Mobile Network Architecture- Yi-Bing Lin, Imrich Chiamtac (John Wiley)

3. Fundamental of Wireless Communication- David Tse, Pramod Viswanath (Cambridge)

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

3. Subject : Microwave Engineering
w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
Practical : 2 hrs / week **TW : 25 Marks**
OE: 50 Marks

Section I

1. Microwave Wave Guides: 6 Hrs

Rectangular and circular wave guides: TE, TM and TEM modes in wave guides, power transmission in wave guide, power losses in wave guide, excitation modes in wave guide, Characteristics of standard wave guides.

2. Microwave Components 6Hrs

Scattering parameters, microwave cavities, microwave hybrid circuits, directional coupler, circulators and isolators, microwave attenuators, slotted lines, parallel, coplanar & shielded micro strip lines. (Operating principle & S-parameter equations of above mentioned microwave components.)

3. Microwave Tubes 8Hrs

Linear beam**:** klystrons, reflex klystrons, TWTs. Microwave Crossed Field Tubes : Magnetons, forward wave crossed field amplifier (FWCFA), m-carcinotron oscillators, high power gyrotrons. (Operating principle, construction & analytical treatment of above mentioned microwave tubes.)

Section II

4. Microwave Solid State Devices 6Hrs

Microwave tunnel diodes, microwave FETs, gunn effect diodes, RWH Theory, LSA diodes, InP diodes, CdTe diodes, Impatt diodes, PIN diodes, ruby laser, MESFETs and HEMT. (Operating principle, construction & analytical treatment of above mentioned microwave devices.)

5. Microwave Measurements 8Hrs

Detection of microwave power: measurement of microwave power bridge circuit, thermister parameters, waveguide thermister mounts, barreters,theory of operation of barreters, direct reading barreters bridges, Measurement of wavelengths: single line cavity coupling system, frequency pulling by reactive load, Transmission cavity wavemeter & reaction wavemeter, measurement of VSWR, measurements of attenuation, free space attenuation, conversion of transmitting and receiving power to electric field intensity, conversion of receiving voltage to electric field intensity.

6. Monolithic Microwave Integrated Circuits & Hazards 6Hrs.

Materials: substrate, conductor dielectric & resistive MMIC growth, thin film formation, hybrid microwave I.C. fabrication microwave hazards.

Text Books –

1. Microwave Devices and Circuit – Samul Liao (Prentice hall of India)
2. Microwave Circuits and Passive Devices – Sisodia and Raghuvanshi Wiley Eastern.

Reference Books –

1. Foundation for Microwave Engg. – R.E.Collin, Wiley Publications
2. Microwave Engineering-David M. Pozer., Wiley Publications
3. Microwave Engineering-Annapurna Das ,TMH Publications
4. Techniques of Microwave Measurement-Carol G. Montgomery
5. Microwave Active Devices vaccum and solid state – M.L. Sisodia
6. Basic laboratory microwave techniques- Manual, Sisodia and Raghuvanshi Wiley Eastern.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)
4. Subject : Embedded Systems
w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
Practical : 2 hrs / week **TW : 25 Marks**
POE: 50 Marks

Section – I

1. Introduction to Embedded Systems 3 Hrs.

Embedded system (ES) definition, Embedded System Evaluation, ES Types with examples, Distinguish a Real Time Embedded System from other systems, Components of an Embedded system, Embedded system design issues & Design flow.

2. Embedded Processor 7Hrs.

The RISC Design philosophy, The ARM design Philosophy, ES hardware, Es software, ARM Architecture Details: registers, CPSR, Pipeline concept, Exceptions Interrupts & vector Table, Core extentions, Architecture revision, families.

3. Introduction to the ARM Instruction Set, THUMB Instruction Set 10hrs.

- ARM Data flow model
- Data processing Instructions
- Load-store Instructions
- Software int. Instructions
- Branch Instructions
- Stack Instructions
- Different addressing modes

Section – II

4. Real Time Operating System (RTOS) 05 Hrs.

Introduction to RTOS concept, embedded software architectures: Round robin, round robin with interrupts, Function queue scheduling and real time operating system, Tasks and task states, Task scheduling, shared data and reentrancy, semaphores and shared data using semaphores, protecting shared data.

5. Communication / Networking standards for embedded Systems 10 Hrs.

a. USART (serial port)
b. I2C, SPI
c. Universal Serial Bus (USB)
d. Ethernet network
e. Controller Area Network (CAN)

6. Case studies of an embedded system **05 Hrs.**

Problem specification, resolving timing problems, use of an RTOS, work division into tasks dealing with shared data, Encapsulating semaphores and queues, Saving Space and Power.

Text Books:

1. Embedded System Design By Peter Marwedel, Springer publication.
2. An Embedded Software Primer, David E. Simon Pearson Education, Asia Publication
3. ARM System Developers Guide Designing & Optimizing System Software By Andrew N., Dominic Sloss, and Chris Wright.

Ref. Books:

1.Embedded System Design A Unified Hardware/ Software Introduction By Frank Vahid/ Tony Givargis ,Wiley publication

2. Real- Time Systems Design and Analysis by Phillips A. Laplante, Wiley insia Edition.

3. Embedded/ Real-Time Systems: Concepts, Design & Programming By Dr. k V K K Prasad ,Dreamtech Press

List of experiments:

1. Four experiments based on assembly language.
2. Four experiments based on Embedded C language.
3. Two Experiments using ARM Boards.
4. Two Experiments based on Bus communication Protocols.

(Use Assemblers, Compilers, Flash Programmers, Debuggers & ARM Boards)

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

5. Subject : DIGITAL SIGNAL PROCESSORS (Elective I)

w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**

SECTION-I

1. INTRODUCTION TO DSP PROCESSORS 5 Hrs

Advantages of DSP Processors, Characteristics of DSP Processors, Applications of DSP Processors, Types of Architectures: VON-Neumann Architecture, Harvard Architecture, Super Harvard Architecture, VLIW Architecture.

2. ARCHITECTURE FOR PROGRAMMABLE DSP DEVICES 8 Hrs

Basic Architectural features, DSP computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed issues Features for External interfacing.

3. EXECUTION CONTROL AND PIPELINING 5 Hrs

Hardware looping, Interrupts, Stacks, Relative Branch Support, Pipelining and performance, Pipeline Depth, Interlocking, Branching effects, Interrupt effects, pipeline Programming models.

SECTION-II

4. PROGRAMMABLE DIGITAL SIGNAL PROCESSORS 9 Hrs

Commercial Digital signal-processing Devices, Architecture of TMS320C67XX Processors, Data Addressing modes of TMS320C67XX Processors, Memory space of TMS320C67XX Processors, Program Control, TMS320C67XX instructions and Programming, On-Chip peripherals, Interrupts of TMS320C67XX processors, Pipeline Operation of TMS320C67XX Processors.

5. Analog DSP Processor family 5 Hrs

Analog 21061 series SHARC Processor block diagram, Interrupt Hardware, Memory quantization, Central arithmetic logic unit, system control etc.

6. IMPLEMENTATION OF BASIC DSP ALGORITHMS 4 Hrs

FIR Filters, IIR Filters, interpolation Filters, Decimation filters, Adaptive Filters, 2-D Signal Processing.

Text & References :

1. Analog Devices & Texas Instruments Users Manuel of TMS320C67XX and ADSP 21061.
2. Architectures for Digital Signal Processing- P. Pirsch, John Wiley
3. Digital Signal Processors- Kuo and Gan, Pearson Education
4. DSP Processor Fundamentals: architectures and Features, by Phil Lapsley, Wiley
5. DSP Applications using C and the TMS320C6x DSP

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

5. Subject : Integrated Communication Systems(Elective –I)

w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
TW : 25 Marks

SECTION -I

1. Amplifiers & Comparators **8 Hrs**

Review of basic theory of amplifiers, frequency response & performance analysis of- high frequency amplifier – MC1490, MC 1350(any one),wideband general purpose amplifiers- used in AGC, RF/Video amplifiers - MC4558.

2. RF communication Systems **8 Hrs**

Review of basic theory & performance analysis of systems- Balanced modulator & demodulator – MC 1496, Wideband FSK transmitter/receiver- MC 3356.
FM transmitter/receiver- MC 2833,FM-IF amplifier-MC3335, AM Receiver- MC 13030, Remote control amplifier/detector- transmitter- MC 14497, receiver –MC 3373

3. Telephone Systems **4 Hrs**

Basic theory , Block schematics, working of systems- Subscriber Loop Interface Circuit (SLIC-MC 33120), PBX- Master MC14522, Slave MC- 145426.

SECTION – II

4. Telephone Systems **4 Hrs**

ISDN voice/ Data Circuits MC 145472, Telephone tone ringer- MC 342117, Speech network dialer- MC 34014/ 34114, Speaker – MC 34018

5. Telephone Accessory Circuits **8 Hrs**

Basic theory , Block schematics, working of systems
Audio amplifier – MC 34119 (or any other low power amplifier circuit)
FSK Modem – MC 145442, calling line identification receiver (CLID) with ring detector – MC 145447/ MC 1455460.

6. Wireless Sensor Networks **8 Hrs**

Basics of Sensor Networks,Communication Protocols for Sensor networks,Medium Access Control (MAC) in WSN, Zigbee,

Applications of Wireless Sensor Network, Case Study as Environmental Parameter Monitoring – Block Diagram and Design of Network System

References :

1.MOTOROLA Analog/ Interface ICs Device Data Manual Vol. 1 & II

2. Wireless Sensor Networks By C.S. Raghvendra,K.M.Shivlingam

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)
5. Subject : Satellite Communication (Elective –I)

Lectures: 4 Hrs/Week **Theory: 100 Marks**

Section – I

1. Orbital Mechanics and Launchers (6)

History of Satellite Communication, satellite communication in 2000.

Orbital Mechanics, Look angle determination, Orbital perturbations, Orbital determination, Launchers and Launch Vehicles, Orbital effects in communication system performance.

2. Satellites (6)

Satellite Subsystems, Attitude and control systems (AOCS), Telemetry, Tracking,Command and Monitoring, Power systems, Communication subsystems, Satellite antennas, Equipment reliability and space qualification.

3. Satellite Link Design (6)

Introduction, Basic transmission Theory, System Noise Temperature and G/T Ratio, Design of Downlinks, Satellite Systems using Small Earth Stations, Uplink Design, Design of Specified C/N : Combining C/N and C/I values in Satellite Links, System Design Examples

4. VSAT System (3)

Introduction, Overview of VSAT Systems, Network Architecture ,VSAT Earth Station Engineering

Section – II

5. Multiple Access (5)

Introduction : TDMA, FDMA, CDMA,DAMA.

6. Low Earth Orbit and Non Geo-Stationary Satellite Systems (8)

Introduction , Orbit considerations, Coverage and frequency Consideration, Delay and Throughput consideration, Operational NGSO constellation design: Iridium, Teledesic

7. Direct Broadcast Satellite Television And Radio (4)

C- Band and Ku- Band Home Satellite TV, Digital DBS TV, Satellite Radio Broadcasting

8. Satellite Navigation and the Global Positioning System (4)

Introduction, Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers and codes, satellite signal acquisition.

Text Books:

1. Satellite Communications – Timothy Pratt, Charles Bostian, Jeremy Allnutt John Wiley & Sons (II Edition)

Reference Books:

1. Satellite Communications – Dennis Roody McGraw Hill

Note : Students, as a part of their term work, should visit satellite earth station and submit a report of visit.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

5. Subject : REMOTE SENSING AND GIS (Elective I)

w.e.f July 2010

Lecture - 4 hrs / week **Paper - 100 marks**

Section – I

1. Introduction **05 hrs**

Definition of GIS, The origins of GIS, What is CADD? What is AM/FM? What is GIS? Applications, GIS industry and GIS software: GIS software vendors, GIS products, GIS users,GIS services, benefits of GIS, Map data security, Elimination of redundancy, Map revisions,search and analysis of map data, productivity of employees, integration of map data.

2. GIS Technology Trends **03 hrs**

Data networks, Data communications, computer hardware, operating system, software engineering.

3. GIS Data **06 hrs**

Sources, collection and Entry, Digitizing, GPS surveying, Digital orthophotography, satellite imagery, GIS Data formats and standards, vector data, Raster data, Raster images, DOD spatial Data standards (SDS), spatial data transfer standard (SDTS), Open Geo-data interoperability specification (OGIS).

4. GIS Analysis, Planning and Implementation **06 hrs**

Network analysis, Digital terrain modeling and analysis, Grid cell GIS modeling and analysis,GIS plan, Components of GIS plan, phases – planning, analysis, implementation successful implementation of GIS, management support leadership and vision, Data conversion and maintenance, Hardware and software, User training, Data communication, Software customization, User support, Funding.

Section – II

5. Pitfalls of GIS **04 hrs.**

Failures, outstanding benefits, experimentation, undefined goals, Lack of long term planning and management support, computerizing existing problems, user involvement, Lack of user training and R and D support, Budget overrun/ underestimation etc.

6. Maintenance and Management of GIS Data base **06 hrs.**

Centralized GIS database, Distributed GIS database, Master and transaction GIS database, Data maintenance issues, Financial and legal aspects of GIS: GIS costs, on going costs, savings, Additional benefits, GIS model for financial justification, Laws for access, pricing, privacy, liability, copyright practice etc.

7. Remote Sensing: **07 hrs.**

Data collection, data types, EM spectrum, radiation and earth, simulated – and earth, simulated –and false-color images, LUT s and band correlation, processing remotely sensed data, rectification, Band stretching, haze corrections, ratios, principal component analysis,

imageenhancement, edge detection, change detection, GPS data acquisition, classification of remotelysensed data, simple discriminant, supervised and unsupervised. Putting it together, types of data and their uses, conflict resolution, visualization, topical issues.

8. Case Study **03 hrs.**

Land record, utility management, oil and gas, global change.

Reference Books:

1. The GIS Handbook – By G.B.Korte 5th Edn. Oxford press.
2. Geological Information System – By Ian wood, Sarah Cornelius, Steve Carver
3. Remote Sensing Application and Geographic Information Systems Recent Trends – By Muralikrishna I.V. TMH

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

6. Subject : Project

w.e.f July 2010

Practical :4 hrs / week **TW : 50 Marks**

The project is to be carried out in two semester of B.E(Electronics and Telecommunications) Part-I and Part-II. The practical batch size for project will be of 15 students. The batch will be preferably divided into groups each consisting of not more than 3 students.

In semester one, group will select a project with the approval of guide and submit the synopsis of project in the month of August. The group is expected to complete detail system design, layout etc. in semester one, as a part of the term work in the form of joint report. In addition all students of project groups will deliver the seminar on the proposed project only.

B.E. (ELECTRONICS & TELECOMMUNICATION ENGG.)

PART – II (Sem VIII)

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

1. Subject: Audio-Video Engineering

w.e.f July 2010

Lectures: 4 Hrs/week **Theory: 100 marks.**
Practical: 2 Hrs/week **TW: 25 marks**
POE: 50 marks

Section-I

1.Fundamentals of Audio-Video Recording and Playback Techniques 4 Hrs
Methods of sound recording & reproduction, optical recording, CD recording, CD & DVD player, MP3 player, MPEG player, audio standards.

2.Fundamentals of Studio Acoustics and Advancements in Audio Technology 4 Hrs
Studio acoustics & reverberation, acoustic chambers, P.A. system for auditorium, Cordless microphone system, special types of speakers & microphones, satellite radio.

3. Elements of a television system 6 Hrs
Picture and sound transmission and reception, CCIR-B standards ,aspect ratio, horizontal and vertical resolution, video bandwidth and interlaced scanning , composite video, signal, H & V sync details, VSB transmission and channel bandwidth: Modulation of picture and sound signals, positive and negative modulation.

4. Colour signal transmission and reception 7 Hrs.
TV camera tubes ,Composite color signals, compatibility considerations, frequency interleaving process, Low level IF modulated color TV transmitter block diagram & Color TV receiver , color mixing theory, luminance, hue and saturation, color difference signals, chromaticity diagram , color signal transmission- bandwidth and modulation of color difference signals, coders and decoders of NTSC , PAL – D & SECAM, Color Picture Tubes, picture tubes purity & convergence, automatic degaussing
.

Section II

5) Digital television 7 Hrs
Introduction to Digital T.V., Principle of Digital T.V., Digital T.V. signals & parameters, Digital T.V. Receiver, MPEG2, JPEG H & G audio & video standards, Digital T.V. Recording/Broadcasting Technique.

6) High definition TV **7 Hrs.**

Component coding ,MAC signals ,MAC encoding format ,scanning frequencies D2-MAC Packet Signal ,Duobinary Coding ,HDTV Standards & compatibility ,colorimetric characteristics & parameters of HDTV systems

7) Advanced TV Systems **7 Hrs.**

LCD TV System :LCD Technology , LCD Matrix types & operations , LCD screen for TV LCD color Receiver, Plasma TV System : Plasma & conduction of charge ,Plasma TV screen ,Signal processing in Plasma TV, Plasma color Receiver, Satellite TV, DTH Receiver System ,CCTV, CATV, working of block converter,: IR Remote control

TEXT & REFERENCE BOOKS :

1. **Modern Television Practice – Principles, Technology and Service** – R.R. Gulati, New Age International Publication, Edition III, 2006
2. **Monochrome and Color TV** – R.R. Gulati, New Age International Publication, 2002.
3. **Color Television Theory and Practice** – S.P. Bali, TMH, 1994.
4. **Television and Video Engineering** - A.M. Dhake, 2nd Edition.
5. **Basic Television and Video Systems** – B. Grob and C.E. Herndon, McGraw Hill, 1999.
6. **Audio-Video Engineering** – R.C.Jaiswal.

Minimum 10 to 12 Experiment based on syllabus.

NOTE: One industrial visit to T.V. Relay center/ Broadcasting station is expected.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

2. Subject : Broadband Communication
w.e.f 2010-11

Lectures : 4 hrs / week **Theory : 100 Marks**
Practical : 2 hrs / week **TW : 25 Marks**

SECTION – I

1. ISDN **8 Hrs**

Switching Techniques, Principles of ISDN, Architecture, ISDN standards, I-series Recommendations, Transmission structure, User network interface, ISDN protocol architecture, ISDN connections, Addressing, Interworking,

2. B-ISDN architecture and standards, B-ISDN Services **6 Hrs**

Conversational, Messaging, Retrieval, Distribution, Business and Residential requirements.

3. B-ISDN protocols **6 Hrs**

User plane, Control plane, Physical layer, Line coding, Transmission structure, SONET-Requirement, Signal Hierarchy, System Hierarchy.

SECTION-II

4. ATM – Overview, Virtual channels **8 Hrs**

Virtual paths, VP and VC switching, ATM cells, Header format, Generic flow control, Header error control, Transmission of ATM cells, Adaptation layer, AAL services and protocols.

5. ATM switching **6 Hrs**

ATM switching building blocks, ATM cell processing in a switch, Matrix type switch, Input, Output buffering, Central buffering, Performance aspects of buffering switching networks.

6. ATM Traffic and congestion Control **6 Hrs**

Requirements for ATM Traffic and Congestion Control, Cell-Delay Variation, ATM Service Categories, Traffic and Congestion Control Framework, Traffic Control, Congestion Control,

Ref :

1. ISDN and Broadband ISDN with Frame Relay and ATM William Stallings, Prentice-Hall, 4th edition

Note: Term work should consist of minimum eight experiments / tutorials based

on above syllabus.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

3. Subject : Image Processing

w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**

Practical: 2 hrs/week **TW: 25 Marks**

OE: 50 Marks

SECTION I

1. Digital Image Fundamentals. 7 hrs

Elements Of Visual Perception, fundamentals steps in DIP, A simple image formation model, Basic concept of sampling and quantization, Representation of binary, Gray level , colour image, Metric & topological properties of digital image , colour model.

2. Image enhancement in spatial domain. 5 hrs

Gray level transformation function: image negation ,Log transformation , power law transformation ,Piecewise linear transformation functions, Histogram equalization, Enhancement using arithmetic / Logic operation.

3. Image filtering 6 hrs

Basics of spatial filtering, smoothening linear filter, Sharpening spatial filter : Gradient and laplacian filter, Filtering in frequency domain: basic properties, filtering in frequency domain

SECTION II

4. Morphological image processing 6 hrs

Dilation & erosion, opening and closing operation , Hit- or –miss transformation. Basic morphological algorithms: Boundary extraction, region filling, thinning and thickening, skeletons.

5. Image segmentation 6 hrs

Detection of discontinuities: Point detection, line detection, edge detection, Sobel, Prewitt, Laplacian mask for edge detection, Thresholding , Role of illumination, global and adaptive thresholding , Region based segmentation : region growing, region splitting and merging.

6. Image compression 6 hrs

Fundamentals, Coding redundancy , interpixel redundancy, fidelity criteria , image compression model, lossless predictive coding, Lossy predictive coding , DCT compression.

Text Books :

1) Digital image processing : Rafael C Gonzalez , Richard E. Woods: Pearson PublicationImage
2) Processing analysis and Machine vision: Milan sonka , Vaclav Hlavac : Thomson Publication

Reference:

1) Digital image processing- S. Jayraman, S Esakkiarajan , Veerakumar:MGH
2) Digital image processing and Analysis- B. Chanda , D. Datta, majnudar:PHI
3) Digital image processing using Matlab- Rafael C Gonzalez.
4) Fundamentals of Digital Image Processing-S.Annadurai, R. Shanmugalaxmi : Pearson Publication

Practical based on MATLAB programs:

1. Reading & displaying of image (various image file format)
2. Simple gray level transformation.
3. Histogram processing.
4. Image smoothening operation.
5. Edge detection.
6. Morphological operation.
7. Segmentation using thresholding.
8. Image compression using DCT.

.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

4. Subject : Speech Processing (Elective II)
w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
TW : 25 Marks

SECTION -I

1. Digital models for the speech signal **5 Hrs.**
Process of speech production, Acoustic theory of speech production, Lossless tube models, and Digital models for speech signals.

2. Time domain models for speech processing **6 Hrs.**
Time dependent processing of speech, Short time energy and average magnitude, Short time average zero crossing rate, Speech vs silence discrimination using energy & zero crossings, Pitch period estimation, Short time autocorrelation function, Short time average magnitude difference function, Pitch period estimation using autocorrelation function, Median smoothing.

3. Digital representations of the speech waveform **5 Hrs.**
Sampling speech signals, Instantaneous quantization, Adaptive quantization, Differential quantization, Delta Modulation, Differential PCM, Comparison of systems, direct digital code conversion.

4. Short time Fourier analysis **4 Hrs.**
Linear Filtering interpretation, Filter bank summation method, Overlap addition method, Design of digital filter banks, Implementation using FFT, Spectrographic displays, Pitch detection, Analysis by synthesis, Analysis synthesis systems.

SECTION – II

5. Homomorphic speech processing 5 **Hrs.**
Homomorphic systems for convolution, complex cepstrum, Pitch detection, Formant estimation, Homomorphic vocoder.

6. Linear predictive coding of speech **6 Hrs.**
Basic principles of linear predictive analysis, Solution of LPC equations, Prediction error signal, Frequency domain interpretation, Relation between the various speech parameters, Synthesis of speech from linear predictive parameters, Applications.

7. Speech Enhancement **4 Hrs.**
Spectral subtraction & filtering, Harmonic filtering, parametric re-synthesis, Adaptive noise cancellation.

8. Speech Synthesis **5 Hrs.**

Principles of speech synthesis, Synthesizer methods, Synthesis of intonation, Speech synthesis for different speakers, Speech synthesis in other languages, Evaluation, Practical speech synthesis.

Text Books:

1. L. R. Rabiner and R. W. Schafer, “Digital Processing of Speech Signals," Pearson Education (Asia) Pte. Ltd., 2004.
2. D. O’Shaughnessy, “Speech Communications: Human and Machine,” Universities Press, 2001.
3. L. R. Rabiner and B. Juang, “Fundamentals of Speech Recognition,” Pearson Education (Asia) Pte. Ltd., 2004.
4. Z. Li and M.S. Drew, “Fundamentals of Multimedia,” Pearson Education (Asia) Pvt. Ltd., 2004.

Reference Books

1. C Becchetti & L P Ricotti, “Speech Recognition Theory & C++ Implementation” John Wiley & Sons
2. D. O’Shaughnessy, “Speech Communication Human & Machine”, Universities Press.
3. B. Gold & N. Morgan “Speech & Audio Signal Processing”, John Wiley & Sons.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

4.Subject : Pattern Recognition(Elective-II)

Lectures : 4 hrs / week **Theory : 100 Marks**
TW : 25 Marks

Section – I

1. Introduction **03 Hrs**
Application of pattern recognition, statistical decision theory.

2 .Probability **05 Hrs.**
Moments of random variables, estimation of parameters from samples, minimum risk estimators.

3. Statistical decision making **06 Hrs**
Introduction, Bay's theorem, multiple features, conditionally independent features, decision boundaries, unequal cost of error, estimation of error rates, the leaving one-out technique, characteristic curves, estimating the composition of population.

4. Non parametric decision making **06 Hrs**
Introduction, histograms, kernel and window estimators, nearest neighbour classification techniques, adaptive decision boundaries, adaptive discriminate functions, minimum squared error discriminant functions, choosing a decision technique.

Section – II

5. Clustering **08 Hrs.**
Introduction, hierachecal clustering :- single linkage, complete linkage, Average linkage, Algorithms, wards method. Partitional clustering : - Forgy's, K means, lsodata algorithm.

6. Object Recognition **06 Hrs.**
Knowledge representation, statistical pattern recognition, Neural Nets:- feed forward network, unsupervised learning, hopefield neural net, Syntactic pattern recognition, fuzzy Optimization technique in recognition :- genetic algorithm, simulated ananealing.

7. Case Studies **06 Hrs.**
Optical Music recognition system, automated identification of airway trees, automated image analysis in cardiology.

Text Books :
1) Earl Gose Richard Johnsonbangh & steve Jost patern recognition & image Analysis prestice Hall India – 2003.
2) Pattern recognition principles. J.T.Toy, R.C. Gonzalez, (Addison Wesley)
3) Image processing Analysis & machine vision. Milan sonka, Vaclav Hlavac, Roger Boyle.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication)

4. Subject : Mobile Communication (Elective II)

w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
T W : 25 Marks

Section – I

1. Introduction to Mobile Communication **6 Hrs.**

Mobile and Personal Communication, mobile and wireless devices, Specialized packet and mobile radio networks, circuit switched data services on cellular networks, packet switched data services on cellular networks

2. Wireless LAN **9 Hrs.**

Introduction, Infrared radio transmission infrastructure and adhoc networks, Detailed study of IEEE 802.11, HIPER LAN, Bluetooth, Wireless ATM

3. Mobile Network Layer **5 Hrs.**

Mobile IP, DHCP (Dynamic Host Control Protocol), Mobile adhoc networks

Section – II

4.Mobile Transport Layer **7 Hrs.**

Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast and Selective retransmission and recovery, Transaction oriented TCP, TCP over 2.5/3G wireless networks.

5. Support for Mobility **7 Hrs.**

File systems, WWW, Wireless application protocol, i-mode, SyncML, WAP 2.0.

6. Security issues in wireless systems **6 Hrs.**

Need for wireless security, Attacks on wireless networks, security services, WEP, VPN

Reference Book:

1. Mobile Communications: Jachen Schiller (Addison Westy)

2. Wireless Networks by P. Nicopolitidis, M. S. Obaidat, G. I. Papadimitriou, A. S. Pomportsis ; Wiley Pub.

Practical: Any 8 experiments based on above syllabus.

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication) Part- I

4. Subject : REAL TIME SYSTEMS (Elective II)

w.e.f July 2010

Lectures : 4 hrs / week **Theory : 100 Marks**
TW : 25 Marks

Section I

1. INTRODUCTION **5 Hrs.**

Issues in Real Time Computing, Structure of a Real Time System, Task,Classes, Performance Measures for Real Time Systems, Estimating Program Run Times.

2. TASK AND SCHEDULING **8 Hrs.**

Task Assignment and Scheduling – Classical uniprocessor scheduling algorithms,Uniprocessor scheduling of IRIS tasks, Task assignment, Mode changes, and Fault Tolerant Scheduling.

3. PROGRAMMING LANGUAGES AND TOOLS **7 Hrs.**

Programming Languages and Tools – Desired language characteristics, Data typing,Control structures, Facilitating Hierarchical Decomposition, Packages, Run – time(Exception) Error handling, Overloading and Generics, Multitasking, Low levelprogramming, Task Scheduling, Timing Specifications, Programming Environments,Run – time support**.**

Section II

4. REAL TIME DATABASES **6 Hrs.**

Basic Definition, Real time Vs General Purpose Databases, Main Memory Databases, Transaction priorities, Transaction Aborts, Concurrency control issues, Disk Scheduling Algorithms, Two – phase Approach to improve Predictability, Maintaining Serialization Consistency, Databases for Hard Real Time Systems.

5. COMMUNICATION **8 Hrs.**

Real – Time Communication – Communications media, Network Topologies Protocols, Fault Tolerant Routing. Fault Tolerance Techniques – Fault Types, Fault Detection. Fault Error containment Redundancy, Data Diversity, Reversal Checks, Integrated Failure handling.

6. EVALUATION TECHNIQUES **6 Hrs.**

Reliability Evaluation Techniques – Obtaining parameter values, Reliability models for Hardware Redundancy, Software error models. Clock Synchronization – Clock, A Nonfault – Tolerant Synchronization Algorithm, Impact of faults, Fault Tolerant Synchronization in Hardware, Fault Tolerant Synchronization in software.

TEXT BOOK:

1. Krishna. C. M, Kang. G, Shin, “Real Time Systems”, McGraw Hill, 2003.

REFERENCE BOOKS:

1. Herma. K, “Real Time Systems – Design for distributed Embedded Applications”, Kluwer Academic, 2002.
2. Real-Time systems by Jane W. S. Liu

Term work : Total eight assignment based on Section I and Section II

SHIVAJI UNIVERSITY, KOLHAPUR

B.E.(Electronics and Telecommunication) Part- II

5. Subject : Project

w.e.f July 2010

Practical : 8 hrs / week **TW : 50 Marks**
POE: 150 Marks

The project group of semester one will continue the project work in semester two and complete the project in all respect(assembly, testing, fabrication, tabulation, test results etc). The project work along with project report should be submitted as part semester two on or before the last day of the semester two.

Subject equivalence for revised syllabus of B.E. (E & TC) w.e.f. 2010-2011

B.E. Part – I

Sr.No.	**Old Syllabus Subjects**	**Equivalent Subject**
1	Digital Communication	Digital Communication*
2	Computer Communication Network	Computer Communication Network
3	Industrial and Power Electronics	Microwave Engineering
4	Satellite Communication	Satellite Communication
5	Elective – I	Elective – I
	VLSI Technology	VLSI Technology*
	Image Processing	Image Processing
	Fuzzy logic	Fuzzy logic*

Note :- * Syllabus for these subjects is as per old Syllabus.

B.E. Part – II

Sr.No.	**Old Syllabus Subjects**	**Equivalent Subject**
1	Broadband Communication	Broadband Communication
2	Mobile Communication	Mobile Communication
3	Audio – Video Engg.	Audio – Video Engg.
4	Elective – II	Elective – II
	Digital Signal Processors	Digital Signal Processors
	Embedded Systems	Embedded Systems
	Pattern Recognition	Pattern Recognition