## TEACHING SCHEME

### B.E. IV (Electronics & Communication Engg.)

#### Semester - VIII

<table>
<thead>
<tr>
<th>Course</th>
<th>Course No.</th>
<th>Duration</th>
<th>Marks</th>
<th>Duration</th>
<th>Marks</th>
<th>Tutorial</th>
<th>Cont.</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio &amp; Video Engg</td>
<td>EC 801 ECC</td>
<td>3 0 2</td>
<td>100</td>
<td>3 30</td>
<td>-</td>
<td>20</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>VLSI Technology</td>
<td>EC 802 ECC</td>
<td>3 0 0</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Cellular Mobile Technology</td>
<td>EC 802 ECC</td>
<td>3 0 0</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Computer Communication &amp; Networking</td>
<td>EC 803 ECC</td>
<td>3 0 2</td>
<td>100</td>
<td>3 30</td>
<td>-</td>
<td>20</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Elective-I</td>
<td>EC 81X ECC</td>
<td>3 1 0</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>25</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>Elective-II</td>
<td>EC 82X EC</td>
<td>3 1 0</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>25</td>
<td>-</td>
<td>25</td>
</tr>
<tr>
<td>Project</td>
<td>EC 804 ECC</td>
<td>0 0 8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>120</td>
<td>-</td>
<td>80</td>
</tr>
<tr>
<td>Seminar</td>
<td>EC 805 ECC</td>
<td>0 2 0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>TOTAL :</td>
<td></td>
<td>15 4 12</td>
<td>-</td>
<td>500</td>
<td>-</td>
<td>210</td>
<td>50</td>
<td>140</td>
</tr>
</tbody>
</table>

Total Contact Hours : 31 Total Marks : 900

**Note:**
1. Students have to opt one subject each from Group-I and Group-II.
2. Seminar is not to be considered as a passing head and evaluation is to be done by the Department.

2. Television cameras and picture tubes: TV camera tubes, Image orthicons videcon plumbicon, pickup tube deflection unit, Video processing of pickup tube signal, electron optics, Electron Gun. Screen and Filters, Deflection of electron beam geometrical Distortion of Booster, transfer characteristics of picture tubes.

3. Video Amplifier and Video Circuits : Transistor, IF amplifier design, Video Detector, Detector polarities, DC components Restoration, HF and LF composition techniques, AGC circuits.

4. Horizontal and Vertical Deflection systems and EHT generation.


6. Audio Engineering : Characteristic of sound, Microphones and Loud speakers, Magnetic recording and reproduction, Optical recording, noise, Distortion and High Fidelity, Stereo tape recording and reproduction, Stereo control, Public address system.

7. V.C.R.

References :

1. A. M DHAKE : Television Engineering .
2. GULATI : Monochrome and colour TV
3. GULATI : Colour T.V Engineering
4. R. G GUPTA : Audio Video system

***
VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION

Semester - VIII

EC 802 ECC CELLULAR MOBILE TECHNOLOGY

<table>
<thead>
<tr>
<th>Teaching Hours</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>0</td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 00</td>
</tr>
</tbody>
</table>

1. INTRODUCTION TO CELLULAR MOBILE SYSTEMS:


2. ELEMENTS OF CELLULAR RADIO SYSTEM DESIGN:

General Description, Concept of Frequency Reuse Channels, CoChannel Interference Reduction Factor, Desired C/I from a Normal Case in an Omnidirectional Antenna Systems, Handoff Mechanism, Cell Splitting, Consideration of the Components of Cellular Systems.

3. CELL COVERAGE FOR SIGNAL AND TRAFFIC:

General Introduction, Obtaining the Mobile Point to Point Model, Propagation over Water or Flat Open Area.

4. CELL-SITE ANTENNA:

Equivalent Circuits of Antennas, Antennas at Cell Site

5. COCHANNEL INTERFERENCE REDUCTION:


6. NONCOCHANNEL INTERFERENCE:

Subjective Test Versus Objective test, Adjacent Channel Intereference, Near-End-Far-End Interference, Effect on Near-End Mobile Units, Cross-Talks.

7. FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT:

Frequency Management, Set-up Channels, Definition of Channel Assignment, Fixed Channel Assignment.
8. **HANDOFFS (H/O) AND DROPPED CALLS:**


9. **OPERATIONAL TECHNIQUES AND TECHNOLOGIES:**

OPERATIONAL TECHNIQUES AND TECHNOLOGIES:

Adjusting the parameters of a Systems, Cell Spillting, Small Cells, Narrow Beam Concept, Separation between Highway Cell Sites.

10. **INTRODUCTION TO DIGITAL SYSTEMS:**

Digital Mobile Telephony, Practical Multiple-Access Schemes.

11. **DIGITAL CELLULAR SYSTEMS:**

Global Systems for Mobile (GSM), North American TDMA, CDMA

**REFERENCE:**


Mobile & Personal Communication Systems and Services by Raj Pandya, PHI Pvt. Ltd., New Delhi,
1. Terminologies related to networks: Subnet, various topologies, Host, Station or node, IMP, various methods of switching etc.
2. Introduction to packet switched networks: LAN, MAN, and WAN
3. OSI reference model and layered approach introduction.
4. TCP/IP reference model.
5. Physical layer-hardware aspects of network designing.
6. Medium access control, data link control and link managemnt.
7. Virtual circuits and datagrams, routing and congestion control in the networking.
8. Concept of internetworking.
9. TCP/IP layer
10. Data security.
11. Application layer, FTP, E-mail etc.

References:


***
1. Telephony:

- Telephone hardware and telephone line, CCITT standards signalling, pulse & tone dialing (DTMF), Elements of switching
- Computer Communication over telephone line: Low, medium and high speed MODEMs with standard bit rates.

2. Overview of ISDN and BISDN: ISDN channels, user access, ISDN protocol.

3. Asynchronous transfer mode: Protocol architecture, ATM logic connections & cells, Transmission of ATM cells, ATM adaptation layer, traffic control ATM in ISDN.

4. Advanced topics on LAN: Ethernet & fast Ethernet, wireless LAN, ATM LAN etc.

References:

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION

Semester - VIII

1.2 EC 812 ECC: Advanced Microprocessor

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 00</td>
</tr>
</tbody>
</table>

1. Multiple Microprocessor Systems and Buses: The 8086 Maximum Mode, 8259A Programmable Interrupt controller, Interface, Direct Memory Access (DMA) Data Transfer, interfacing –Intel 8237, Refreshing Dynamic RAM. The 8087 Math Coprocessor, Multiple bus Microcomputer systems.


3. Introduction to Advanced Microprocessor: Overview of 80186, 80286, 80386, 80486 Architectures, Descriptor table, Privilege levels, paging. Detail study of Pentium, Pentium MMX architecture, PentiumII, Memory and Microprocessor, The programming Model, Real mode and Protected mode Memory addressing, Data formats

4. The 80386 and 80486 Microprocessors: Architecture-Real mode and Protected mode, 80386 Memory management, Memory segmentation, Memory paging Mechanism, On chip cache organization.

5. Assembly language and Programming Concepts: The instruction set, Addressing modes, Data movement instructions, Arithmetic and logic instructions, programming the Microprocessor

6. Interfacing and Applications: Memory interfacing, Basic I/O interfacing.

References:

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV  ELECTRONICS & COMMUNICATION

Semester - VIII

1.3 EC 813 ECC : Programmable Logic Controllers & Distributed Control Systems

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 00</td>
</tr>
</tbody>
</table>

1. PLC EVOLUTION : Evolution of Modern Day PLC, Contribution of Microprocessors, PCs & DSP in the development of PLCs.
2. FUNCTIONAL ELEMENTS OF PLC : Architecture-Programming the PLC, Ladder Logic Diagram, Communication in PLCs, Comparative Study of Industrial PLCs.
3. FUNCTIONAL ELEMENTS OF DISTRIBUTED CONTROL SYSTEMS : Different Architectures functional elements-Remote Electronic Unit, Operator Station.
4. REDUNDANCY & CASE STUDIES IN DCS : Comparative study of Industrial DCS, Reliability factors, Redundancy, Case Studies.
5. COMMUNICATION : Different Methods of Communication, Requirement of Communication Networks for control purposes, Communication protocols networks(Ethernet), Manufacturers Automation Protocol, Field Bus.

References :

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION

Semester - VIII

1.4 EC 814 ECC : Biomedical Instrumentation

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 00</td>
</tr>
</tbody>
</table>

1. Basic concepts: Generalized instrumentation system, medical measurement constraints
2. Biomedical Transducers and their principles: Resistive, capacitive, inductive and piezo-electric transducers, temperature measurement, ultrasonic scanners, Displacement.
5. Biopotential Amplifiers: Transducer as sensing elements, design of active filters for obtaining the desired frequency characteristics, Instrumentation amplifiers.
7. Safety considerations in the Design of Biomedical Instruments.

References:

3. John G. Webster (Editor): Medical Instrumentation, Houghton Mifflin Company
VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION
Semester - VIII
1.5 EC 815 ECC : Digital & HD TV Technology

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td>Examination</td>
<td></td>
<td></td>
<td>Examination : 00</td>
</tr>
</tbody>
</table>


3. Charge Coupled Device Imagers (CCDs) : CCD Photosensor Arrays, CCD transfer and readout architecture, storage tube and CCD performance.


5. HDTV Equipments : Camera, Recorders, Display devices, Cathode Ray Tube Display, Light Value Projection Display, Flat Panel Display.

References:

***
1. Brief overview on the concepts of networking & TCP/IP model.
2. Internetworking various bridges, routers, hubs.
3. Client and Server model.
4. Internet standards.
5. Services available on the Internet Electronic mail (SMTP), Bulletin Board Service (BBS), FTP, Remote login (TELNET) etc.
6. URL.
7. Browsing the world wide web, world wide web documents (HTML), advanced web technologies, Automated web search/search engines)
8. Audio & Video Communication & Teleconferencing on Internet
10. Introduction to JAVA programming

Reference:

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION

Semester - VIII

1.7 EC 817 ECC : Fuzzy Logic in Control Systems

<table>
<thead>
<tr>
<th>Teaching Hours</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination Scheme Marks</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>0</td>
<td>: 00</td>
<td></td>
</tr>
</tbody>
</table>

1. INTRODUCTION TO FUZZY LOGIC : Review of crisp set theory – Basic concepts of fuzzy sets, fuzzy logic, operations on fuzzy sets.

References :

2.1 EC 821 ECC : Mobile Communication

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination  : 00</td>
</tr>
</tbody>
</table>

1. Mobile radio environment : Propagation & path losses, fading, various interference effects, effect of weather, shadow effect etc.
2. Frequency concept, channalized schmes and frequency reuse, FDM & TDM, spread spectrum modulation techniques- direct sequence & frequency lopped, corier to noise ratio.
3. System base station (fixed unit), Mobile unit, antennas, MTSO (mobile telcom, switching office)
4. Signalling & channel access.
5. Advance topics : radio paging, cellphone, Land mobile satellite communication system, GSM technique, UMTS, wireless networks.

Reference :

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION

Semester - VIII

2.2 EC 822 ECC : Advance Power Electronics

<table>
<thead>
<tr>
<th>Teaching Hours</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examination Scheme Marks</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
<td></td>
</tr>
<tr>
<td>Examination</td>
<td>00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Resonant Converters : Classification of resonant converters zero-voltage/zero-current switchings circuit topologies.
3. Vector control of AC drives. Stepper motor control technique battery operated vehicles, uninterruptible Power converters
5. Active Power Filters : Basic operation, circuit configurations shunt, series, shunt/series. Hybrid configuration, Active/passive, control strategies.

References :


***
1. Introduction to Analog VLSI. Design of linear and non-linear AICs including op-amps, voltage reference source and regulators, comparators & drivers, power stages, oscillators and multipliers, use of feedback and noise performance.
2. FET analog switches, programmable gain op-amp, Norton op-amp, Bi-FET technology in op-amp & linear ICs, switched capacitor filters, sample 7 hold Ics.
3. Analog integrated circuit sensors:-Introduction, mechanical sensors, humidity sensors, magnetic sensors, sensor interfaces.

References:


***
1. Structure of instrumentation system for process control applications. Pneumatic Vs electronics instrumentation.

2. Temperature:- Thermocouples, resistance thermometers, pyrometers, electronic and pneumatic transmitters, dynamics of temperature measurement devices.

3. Pressure:- Bellows, diaphragm and Bourdon gauge, electronic transmitters (strain gauge, capacitance, differential transformer, piezo-electric etc). Purge methods for pressure measurement.


5. Level measurement:- Differential pressure Bubbler types level system, ultra sonic, and Radar type.

6. Gas analyzers

7. pH analyzer and control.

8. PID controller.

References:

1. D.M. Considine, Process instruments and control handbook, M. Graw Hill

***
VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION

Semester - VIII

2.5 EC 825 ECC : Radar and Navigational Aids

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 00</td>
</tr>
</tbody>
</table>

RADAR

2. MTI & Pulse Doppler Radar : Introduction, Delay line Cancellers, Staggered or Multiple PRF.
3. Tracking Radar : Sequential Lobing, Comical Scan, Monopulse TR.

NAVIGATION AIDS

2. Radio Ranges.
3. Hyperbolic System of Navigation. DME and TACAN.
4. Aids to Approach and Landing.

References :

1. INTRODUCTION TO DATA PROCESSING : Data Processing Techniques; Traditional Data Processing & Data Base Processing Techniques; DBMS, Data Independence, Shared Data- Advantages of DBMS, Architecture of a typical DBMS; DDLs; DMLs; Query Languages; Embedded Query Languages.

2. DATA BASE PROJECT DEVELOPMENT PROCESS : Information Model; Universe of Discourse; Logical Database Design; Physical Data Base Design; Semantic Data Model; Relationships in SDM; Other Data Models; DBTG; Hierarchical Model; ER Model; ANSI/X3/SPARC Model; Relational Model; Comparison; Study of DBTG & Hierarchical Model only from comparison point of view; Super keys; Generalization & aggregation.

3. System Flow Study of Commercial Applications like Payroll; Inventory control; Accounting; Sales; University Course Management etc Implementation issues.

4. Characteristics of secondary storage devices; file organization techniques; Performance of heap; sequential; indexed sequential hashed; multiindexed; inverted; and multi-ring files B; trees use of files in data processing.

5. Implementation of commercial systems like pay-roll; inventory control etc. with a typical DBMS package.

Reference:


References :

2. Intel MCS-51,MCS96/MCS296 Data sheets
<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td></td>
<td></td>
<td>Cont. Evaluation : 80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 120</td>
</tr>
</tbody>
</table>
VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV  ELECTRONICS & COMMUNICATION

Semester - VIII

EC 805 ECC : Seminar

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Internal Examination Scheme Marks</td>
<td>-</td>
<td>-</td>
<td>Cont. Evaluation : 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 30</td>
</tr>
</tbody>
</table>

EC 818 ECC INFORMATICS

[ELECTIVE 1.4, GROUP-I]

B E IV (Electronics & Commumciition Engg) - 8" Semester (New Scheme)

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Hours</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td>Cont. Evaluation : 00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Examination : 00</td>
</tr>
</tbody>
</table>

1. LOCAL AREA NETWORKS (INTRODUCTION TO LAN):
IEEE 802 Protocols, B02 1 (Internetworking), 802.2 (LLC), 802.3 (CSMA/CD), 802. 4 (Token bus), 802.5 (Token Ring)

2. ADVANCED TOPICS ON LAN:

Fast Ethernet; FDDI, Wireless LAN

3. METROPOLITAN AREA NETWQKK:

Metropolitan Area Network (IEEE 802.6) and SMDS (Switched Multimegabit Data Service)
4. INTEGRATED SERVICE DIGITAL NETWORK (ISDN):


5. BROADBAND ISDN:

Layered Model. Interactive & Distributive Services, B-ISDN Access Methods, Comparison of ISDN&B-ISDN

6. FRAME RELAY SERVICES:

Frame Relay Operation, Layers & Implementation.

7. ASYNCHRONOUS TRANSFER MODE (ATM):

ATM Layered Model (Protocol Architecture), ATM Topology, ATM Cell & Headers, AAL & ATM Layers in Detail, ATM Switches. ATM LAN.

8. SOMET/SDN


REFERENCE

1) Introduction to Data Communications & Networking by Belirowz Forouzan, Tatt McGraw Hill, 1999


Examples of analog pulse and digital transmission systems. Performance analysis of analog and pulse modulation systems.

Role and review of probability theory and stochastic processes in digital message transmission.

Principles of detection theory: Binary and m-ary hypothesis testing. Bayes' likelihood ratio test.

Performance analysis of digital communication systems.

Spectrum of digital signals Spectral efficiency of digital communication systems, Nyquist pulse shaping.

Correlative coding schemes. Equalization techniques. Synchronization techniques Carrier, bit and frame synchronization schemes.

Reference:
VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E. IV ELECTRONICS & COMMUNICATION

Semester - VIII

ECS20ECC ADAPTIVE SIGNAL PROCESSING

(ELECTIVE 1.6, GROUP-I)
B E IV (Electronics & Communication Engg)

<table>
<thead>
<tr>
<th>Teaching Hours</th>
<th>Lecture</th>
<th>Tutorial</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Examination Scheme Marks</td>
<td>100</td>
<td>25</td>
<td>Coin. Evaluation : 00 Examination : 00</td>
</tr>
</tbody>
</table>

- Review of linear and non-linear estimation theory. Signal modeling. Optimal filtering
- Adaptive filtering as an extension of the optimal least mean square error case
- Adaptive algorithms. adaptive equalization and echo cancellation; adaptive lattice filter
- Application to radar, sonar, geophysics and hydrology, economic processes, communications (spread spectrum techniques).

REFERENCE:


I. MICROWAVE LINK:


2) Free Space Propagation

3) Atmospheric Effects: Absorption, Refraction, Ducting


5) Fading: Flat Fading, Frequency Selective Fading, Factors Affecting Multipath Fading.

6) Availability: Performance Objectives.

7) Diversity: Spate Diversity and Frequency Diversity.

B) Link Analysis Hop Calculations, Passive Repeaters, Noise.

II. DIGITAL MICROWAVE RADIO SYSTEMS:

2) Digital Microwave Radio Systems; 140 MWs DMR with 16-QAM, Digital Microwave Radio Transceiver Components, 140 Mb/s DMR with Higher Modulation Levels, Low-Capacity RMR.


4) Comparison between Analog and Digital Microwave Radio: Composition of the Baseband, FM Analog Microwave Radio, Measurements.

REFERENCE:

   International Editions, 1993

1. INTRODUCTION

Evolution of Telecommunication, Simple Telephone Communication, Basic of a Switching System

2. STROWCEKSWITCHINGSYSTEMS:

Rotary Dial Telephone, Signaling Tones, Stronger Switching Components. Steep-by-Slicp Smctliing, Design Parainerois

3. CROSSBAR SWITCHING:

Principals, of Common Control, Touch Tone Dial Telephone, Principals of Crossbar Switching. Crossbar Switch Configurations, Crosspoint Technology.

4. ELECTRONIC SPACE DIVISION SWITCHING:

Stored Program Control, Centralized SPC, Distributed SPC, Enhanced Services, Two-Stage Networks, Three-Stage Networks

5. TIME-DIVITION SWITCHING:

Basic Time Division Space Switching, Basic Time Division Time Switching, Time Multiplexed Space Switching, Time
Multiplexed Time Switching Combination Switching, Twice - Stage Combination Switching

6. TRAFFIC ENGINEERING:

Network Traffic Load and Parameters. Grade of Service and Blocking Probability. Modeling Switching Systems, Incoming


7. TELEPHONE NETWORKS:

Subscriber Loop Systems, Switching Hierarchy and Routing, Transmission Plan, Numbering Plan, Charging Plan, Signalling

Techniques, Inchannel Signalling, Common Channel Signalling.

REFERENCE:

1 Telecommunication Switching System and Networks by Tluagarfljan Viswanainan. Premiee Hall of India Pvt Ltd. New Delhi, 1996 Reprint

2 Principles of Communication Systems by Taub & Schilling, Tata Mcfiraw Hill.
Image representation - Gray scale and colour Images, image sampling and quantization.

Two dimensional orthogonal transforms - DFT, FFT, WHT, Haar transform, KLT, DCT

Image enhancement - filters in spatial and frequency domains, histogram-based processing, homomorphic filtering.

Edge detection - non parametric and mode! based approaches, LOG filters, localisation problem. Image Restoration - PSF, circulant and block - circulant matrices, deconvolution, restoration using inverse filtering, Wiener Filtering and maximum entropy-based methods

Mathematical morphology - binary morphology, dilation, erosion, opening and closing, duality relation?, gray scale morphology, applications such as hit-and-miss transform, thinning and shape decomposition


Image texture analysis - co-occurrence matrix, measures of textures, statistical models for textures.

Misc. topics Such as - Hough Transform, boundary detection, chain coding, and segmentation, thresholding methods.
REFERENCE:


5 A Rosenfold and A. C. Kak, Digital image processing, Vols. 1 and 2, Prntntice Hall, 1986.