VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

B.E.IV (Electronics) - 8th Semester		Teaching Scheme			Examination Scheme						
		L	T	P	Theory Exam		Practical/Quiz/Viva/T.W. etc.				
		Hrs.	Hrs.	Hrs.	University Exam.		University Exam.		Tutorial	Cont.	Total Marks
Course	Course No.				Dura-tion	Marks	Duration	Marks			
					Hrs.		Hrs.				
Audio & Video Engg	EC 801 EC	3	0	2	3	100	3	30	-	20	50
VLSI Technology Cellular Mobile Technology	EC 802 EC EC 802 ECC	3	0	0	3	100	-	-	-	-	-
Computer Communication & Networking	EC 803 EC	3	0	2	3	100	3	30	-	20	50
Elective-I	EC 81X EC	3	1	0	4	100	-	-	25	-	25
Elective-II	EC 82X EC	3	1	0	4	100	-	-	25	-	25
Project	EC 804 EC	0	0	8	-	-	-	120	-	80	200
Seminar	EC 805 EC	0	2	0	-	-	-	30	-	20	50
	TOTAL :	15	4	12	-	500	-	210	50	140	400
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.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

	Lecture	Tutorial	Practical
Teaching Hours	3	0	2
Examination Scheme Marks	100	00	Cont. Evaluation : 20 Examination : 30

1. Vision characteristics and scanning system: Introduction to basic Television systems, characteristics of human Eye, resolution of Brightness perception. Aspect ratio, Flicker. The Kell Factor. Horizontal and vertical resolution, Video Band width, Inter laced scanning. Composite video signal: Video signal components, Video Modulation .Vertical side band signal .Sound Modulation and inter carrier system, Reception of vestigial side band signal Television broadcast channels and standards.
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.
5. Colour Television : Colour Fundamentals, Colour T.V cameras, Colour picture tube, colour T.V transmission and reception, NTSC SECAM system, PAL system.
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

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

EC 802 ECC CELLULAR MOBILE TECHNOLOGY

	Lecture	Tutorial	Practical
Teaching Hours	3	0	0
Examination Scheme Marks	100	0	Cont. Evaluation : 00 Examination : 00

1. INTRODUCTION TO CELLULAR MOBILE SYSTEMS :

   A Basic Cellular System, Performance Criteria, Uniqueness of Mobile Radio Environment, Operation of Cellular Systems, Marketing Image of Hexagonal-shaped Cells.

2. ELEMENTS OF CELILLAR 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 Mechnism, Cell Splittin, 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 :

   Euivalent Circuits of Antennas, Antennas at Cell Site

5. COCHANNEL INTERFERENCE REDUCTION :

   Exploring Cochannel Interference Area in a System, Real-Time Interference Measurement at Mobile Radio Transceivers, Design of an Omnidirectional Antenna System, in the Worst Case, Design of a Directional Antenna System.

6. NONCOCHANNEL INTERFERENCE :

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

7. FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT :

   Frequency Management, Set-up Channels, Defination of Channel Assignment, Fixed Channel Assignment.

8. HANDOFFS (H/O) AND DROPPED CALLS :

Value of Implementing Handoffs, Initiation of a H/O, Delaying a H/O, Forced H/O, Queuing of H/O, MAHO and Soft H/O, Intersystem H/O, Introduction to Dropped Call Rate.

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:

1. Mobile Cellular Telecommunications by William C.Y. Lee, Second Edition, McGraw Hill, Inc., 1995

2. Wireless Digital Communication : Modulation and Spread Spectrum Application by Kamilo Feher, Prentice Hall of India Pvt. Ltd., 1999.

3. Mobile Communication Engineering by William C.Y. Lee, Second Edition, McGraw Hill, International edition, 1998

Mobile & Personal Communication Systems and Services by Raj Pandya, PHI Pvt. Ltd., New Delhi,

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

802 EC : VLSI Technology

	Lecture	Tutorial	Practical
Teaching Hours	3	0	0
Examination Scheme Marks	100	00	Cont. Evaluation : 00 Examination : 00

1. Introduction to VLSI & practical consideration : Introduction, Size & complexity of integrated circuit, The microelectronic field, IC Design process, economics, yield, Trends in VLSI design
2. Technology : IC production process, Semiconductor processes, Design rules & process parameters, Layout technique & practical consideration.
3. Device modeling & Circuit simulation : Modeling, MOS models Diode models, Bipolar models, passive component models. Circuit simulation using spice, MOSFET model, Diode model ,BJT model.
4. Basic IC building blocks : Switches, active resistors, current sources & sinks, current mirrors/amplifiers, voltage & current references
5. Amplifiers : Inverting amplifiers, improving the performance of inverting amplifier, Differential amplifiers, Output amplifiers, operational amplifiers, comparators
6. Digital Circuits : Design abstraction, Characteristics of digital circuits, single channel MOS inverters, NMOS NOR & NAND logic circuits , Complementary MOS inverters, CMOS logic gates, Transmission gates, single propagation delays, Capacitive loading consideration, Power dissipation, Noise in digital logic circuits
7. Structured Digital Circuits & systems : Random logic versus structured logic forms, PLA, Structured gate layout, Logic gate arrays, MOS clocking schemes, Dynamic MOS storage circuit, Clocked CMOS logic, Semiconductor memories, Read only memory, Static RAM memories, Dynamic RAM memory, Register storage circuit, PLA based finite state machine, Microcoded controllers, Microprocessor design, Systolic arrays
8. Introduction to computer based VLSI design.

References :

1. Randall L Gieger Phillip E. Allen, Noel R. Strader, VLSI Design Techniques for Analog & Digital Circuits.
2. Jaeger, Microelectronics Circuit Design McGraw Hill. IS Edition
3. Sze, VLSI Technology, 2nd Edition, 199 , McGraw Hill, IS Edition.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

EC 803 EC : Computer Communication & Networking

	Lecture	Tutorial	Practical
Teaching Hours	3	0	2
Examination Scheme Marks	100	00	Cont. Evaluation : 20 Examination : 30

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.
12. Various standards for networking.

References :

1. Computer Networks by Andrew S. Tanenbaun PHI, 3rd edition-1998
2. Data & Computer Communication by William Stallings 5th edition 1998.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

ELECTIVE GROUP - I

1.1 EC 811 EC : Telematics

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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 soeed 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 adaption layer, traffic control ATM in ISDN.
4. Advanced topics on LAN : Ethernet & fast ethernet,, wireless LAN, ATM LAN etc.

References :

1. Telecommunication Switching Systems & Networks. By Tyagrajan Viswanathan PHI 1st edition 1994
2. Data & Computer Communication by William Stallings Mcmillan 5th edition 1998
3. Computer Networks by Andrew S. Tanenbaun PHI 3rd edition 1998.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

1.2 EC 812 EC : Advanced Microprocessor

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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.
2. Microcomputer System Peripherals: Microcomputer display, CRT controller Intel 8275,Display adapters-MDA, CGA, EGA ,VGA and SVGA, Floppy disk controller –Intel 8272A,Magnatic disk data storage, Optical disk data storage, Printer Mechanism., A serial Interfacing device –8251A.,Serial data transmission and standards.
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 :

1. Douglas V. Hall, Microprocessor and Interfacing, McGraw Hill,2nd Edition, Reprint 1995
2. Barry B.Brey, The Intel Microprocessors 8086/8088,80186,80286,80386 and 80486 Architecture, Programming and Interfacing, Prentice Hall of India, Third Edition.
3. Microprocessor and Peripheral Hand book Volume-1,Intel corporation.
4. Intel 486TM Microprocessor and Related Products, Intel corporation.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

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

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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, Compartive 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 :

1. Programmable Controllers, Thomas A. Hughes, Instrument Society of Americal,1989.
2. Programmable Logic Controllers Architecture and Applications, Gilles Michel, John Wiley & Sons, 1990
3. Distributed Control Systems, Michael P Lucas, Van Nostrand Rein hold Company, New York, 1986.
4. Digital Control Devices, Moore, ISA Press, 1986.
5. Programmable Controller – Principles & Applications, John W Webb, Murrill Publishing Co. USA, 1988.
6. Understanding and using Programmable Controllers, Thomas E Kissell, Prentice Hall International Inc., Englewood Cliffs, NJ, 1986.
7. Logic Design Principles, Edward J McCluskey, Prentice Hall International, USA, 1986.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

1.4 EC 814 EC : Biomedical Instrumentation

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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.
3. Bioelectric Potentials & their Measurement : Action potential, resting potential, the cell as bioelectric generator. The heart circulatory system. Electro cardiography (ECG). The Brain and central nervous system, electro encephalography(EEG). Evoked cortial, responses, electro retinography(ERG) Stimulation, electro myography(EMG), Measurement of heart rate, Blood pressure measurement, Measurement of temperature, measurement of respiration rate.
4. Biopotential Electrodes: The electrode- electrolyte interface, polarization, polarizable and non-polarizable electrodes, electrode behaviour and circuit Model, electrode skin interface and motion artefact, Microelectrodes, practical hints in using electrodes.
5. Biopotential Amplifiers : Transducer as sensing elements, design of active filters for obtaining the desired frequency characteristics, Instrumentation amplifiers.
6. Measurement of flow and volume of Blood : Ultrasonic scanner as sensing elements, amplifiers and indicators.
7. Safety considerations in the Design of Biomedical Instruments.

References :

1. Cromwell : Biomedical Instrumentation and Measurements, Prentice Hall of India.
2. R.S. Khandpur : Handbook of Biomedical Instrumentation, Tata McGraw-Hill
3. John G. Webster (Editor): Medical Instrumentation, Houghton Mifflin Company
4. Harry E. Thomas : Handbook of Biomedical Instrumentation and Mesaurement, Reston Publishing Company..

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

1.5 EC 815 EC : Digital & HD TV Technology

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

1. Elements of Television Picture quality Basic Image Quality Criteria, Image defects, Characteristics of Human Vision, Image Definition, Limiting Resolution, Aperture Response, Television System Aperture Response Vertical Definition, Broadcast Systems, Horizontal Definition, Broadcast Systems, HDTV System Aperture Response , Visual Perception of Broadcast and HDTV Image, Image Gray scale, Signal to Noise Ratio, Image Defects, Analysis of the Sampling Process.
2. Digital Television: Analog and Digital Formats, Comparison of Digital and Analog Formats, Transmission and Recording Formats, Signal Processing Functions, Analog to Digital Conversion, Sampling, Bitrates and Bandwidth Requirements, Quantizing, Encoding, Synchronization, Transmission of Digital Signals, Video Bandwidth Compression, Digital Bandwidth Compression Technologies.
3. Charge Coupled Device Imagers (CCDs) : CCD Photosensor Arrays, CCD transfer and readout architecture, storage tube and CCD performance.
4. HDTV Systems : HDTV Performance Objective, HDTV Performance Parameters, Deficiencies of Conventional Video System, Compatibility, Definition and Status, HDTV Technical Challenges, Bandwidth Reduction Technologies, Simulcast Channel Format Selection Procedure, Proposed Simulcast Channel Formats, Wideband HDTV Systems.
5. HDTV Equipments : Camera, Recorders, Display devices, Cathode Ray Tube Display, Light Value Projection Display, Flat Panel Display.

References :

1. Andrew F. Inglis, Video Engineering, McGraw Hill International Edtion.
2. Arch Luther, Digital Video ina PC Environment McGraw Hill, Newyork 1991.
3. Benson K. Blair & Donald G Fink, HDTV-Advanced Television for 19905, Mcgraw Hill-Newyork 1991.

4. Benson K Blair, Telvision Engineering Handbook Featuring HDTV Systems McGraw Hill

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

1.6 EC 816 EC : Internet, Programming & Application

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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/serchengines)
8. Audio & Video Communication & Teleconferencing on Internet
9. The global digital library.
10. Introduction to JAVA programming

Reference :

1. The Internet by Douglas E. Comer, PHI, Second Edition-1997

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

1.7 EC 817 EC : Fuzzy Logic in Control Systems

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

1. INTRODUCTION TO FUZZY LOGIC : Review of crisp set theory – Basic concepts of fuzzy sets, fuzzy logic, operations on fuzzy sets.
2. FUZZY LOGIC CONTROL PRINCIPLES : Definition and Terminology, Fuzzy Relations, Fuzzy Conditional Statements, Fuzzy Rules, Fuzzy Algorithms, Functional Diagram.
3. FUZZY LOGIC CONTROL SYSTEM : Fuzzy Logic Controller, Fuzzification Interface, Knowledge Base, Decision Making Logic, Defuzzification Interface.
4. FUZZY LOGIC CONTROLLER : Design of Fuzzy Logic Controller, Functional Diagram Approach, Developing Fuzzy Model, Performance comparison with Conventional Controllers, Fuzzy Controller Stability Analysis.
5. CASE STUDIES : Fuzzy Logic Controller in Cement Kiln-Fuzzy Logic Controller in Power Plants, Fuzzy logic Controller in Serve Systems.

References :

1. Fuzzy Sets, Uncertainty and Information, Klir G J, Prentice Hall of India, 1991.
2. Fuzzy Control and Fuzzy System, John Wiley, 1989.
3. Modern Control Engg., Ogata, Prentice Hall of India, 1985.
4. Fuzzy Set Theory & Applications, H J Zimmermann, 2nd Edition.
5. An Introduction to Fuzzy Control, D Drianbor, H Hellendoorn, M Reinfrank, 2nd Edition.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

ELECTIVE GROUP - II

2.1 EC 821 EC : Mobile Communication

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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 :

1. Lee, Mobile Communication, McGraw Hill.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

2.2 EC 822 EC : Advance Power Electronics

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

1. Resonant Converters : Classification of resonant converters zero-voltage/zero-current switchings circuit topologies.
2. Pulse width Modulation techniques for converter Control Selective hormone elimination techniques. State vector PWM control of voltage control and current controller inverter, Hysteresis- Band current control. Critical evaluation of PWM techniques.
3. Vector control of AC drives. Stepper motor control technique battery operated vehicles, uninterrptible Power converters
4. Photovoltaic power conlitioning, characteristic of photovoltic cell. Peak Power tracking control of converters. Stand alone converters, grid assisted control, grid interfacing house-hold application.
5. Active Power Filters : Basic operation, circuit configurations shunt, series, shunt/series. Hybrid configuration, Active/passive, control strategies.

References :

1. NED Mohan etc. : Power Electronics Converters, Application and Design, John Wiley & Sons, 1996.
2. K. Bose, Power Electronics and variable frequency drives IEEE Pren. 1997.
3. K. Bose, Modern Power Electronics, Evoluation, Technology and Applications Jaico Publishing House, 1993.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

2.3 EC 823 EC : Advanced Analog Integrated Circuits

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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. MOHMED ISMAIL & FIEZ.T.: Analog VLSI – Signal & Information Processing.----- Mc. Graw Hill (I.S. Ed)-1994
2. GEIGER, ALLEN, STRADER: VLSI – Design Techniques for Analog and Digital circuits, Mc Graw Hill (I.S. Ed)-1990.
3. LARER & SANSEN: Analog Integrated Circuits, Mc. Graw Hill (I.S. Ed)-1995.
4. GEIGER : Micro electronics circuit design, Mc. Graw Hill (I.S. Ed)-1997

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

2.4 EC 824 EC : Process Instrumentation and Control

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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.
4. Flow:- orifice, venturi, nozzle, sizing of orifice plates. Differential pressure transmitters. Rotameters for local and remote indication. Turbine meters vortex, Electro-magnetic ultrasonic flow meters with associated instrumentation.
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, Mc. Graw Hill
2. Liptak, Instrument engineer’s handbook Vol-1 & 2 Chilton Book Co.

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VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

2.5 EC 825 EC : Radar and Nevigational Aids

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

RADAR

1. The Nature of Radar : Radar Equation, Radar Block Diagram and operation, Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Transmitter Power, PRE and Range ambiguities, Antenna parameters.CW & FM Radar : Doppler effect, CW, Radar, FMCW Radar.
2. MTI & Pulse Doppler Radar : Introduction, Delay line Cancellers, Staggered or Multiple PRF.
3. Tracking Radar : Sequential Lobing, Comical Scan, Monopulse TR.
4. Phased Array Antenna in Radar : Basic Concepts, Phase Shifters, Frequency-scan arrays, Array elements, Feeds for Arrays.Other Radars : Synthetic Aperture Radar, HF over-the-horizon Radar, Air-Surveillance Radar, Height-Finder and 3-D Radars.

NAVIGATION AIDS

1. Radio Direction Finding.
2. Radio Ranges.
3. Hyperbolic System of Navigation.DME and TACAN.
4. Aids to Approach and Landing.
5. Doppler Navigation.
6. Satellite Navigation.
7. Global Positioning System.

References :

1. Introduction to Radar Systems : M. I. Skolnik, McGraw Hill Pub., International edition.
2. Elements of Electronic Navigation : N. S. Nagaraja, TMH Pub., Co. New Delhi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

2.6 EC 826 EC : Computer Based Information Processing

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

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 :

1. MAJUMDAR A K & BHATTACHARYA P: Introduction to Data Base Management Systems, Tata McGraw- Hill, 1996 Edition.
2. KORTH & SCHILBERSCATZ, Data Base Systems Concepts, McGraw-Hill, IS 2nd edition, 1995 Reprint.
3. NAVEEN PRAKASH : Inroduction to Data Base Management Systems, Tata McGraw- Hill, 1991 edition, 1994 Reprint.
4. B RAM, Computer Fundamental Architecture & Organization, Wiley Eastern Limited, 1992 reprint.
5. VIPUL LAL, Inside Clipper 5, Tata McGraw Hill, 1995 Reprint.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

2.7 EC 827 EC : Micro Controllers and Applications

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

1. Microprocessors and Microcontrollers : Comparing Microprocessors and Microcontrollers, The Z80 and MCS 51, Microcontroller survey.
2. The MCS-51 Architecture:Introduction,MCS-51 family microcontrollers hardware, Input/output pin, ports and circuits, External memory interfacing, counter, timer, serial data input /output, Interrupts.
3. Basic Assembly Language Programming Concept: Addressing mode, External data, move,Code memory read – only data moves, Push and Pop opcodes, Data Exchanges, Logical operations, Arithmetic operations,Branching Instructions, Interrupts and Returns.
4. An MCS-51 Microcontroller Design : Microcontroller Specification, External memory and Memory space Decoding, Expanding I/O, Memory map I/O, Memory address decoding, Testing the Design,Lookup table for the 8051,Serial data Transmission
5. MCS-96/MCS-296 Microcontrollers : Introduction, Features, Architecture, Basic assembly language programming concepts,Instruction set.
6. Application Of MCS-51, MCS-96 / MCS-296 : Interfacing with Peripheral I/C and other peripheral IC, Pulse Measurement, Interfacing with D/A and A/D Converter, Multiple Interrupts, Data communication modes, Industrial applications and Interfacing.

References :

1. Kenneth J. Ayala : The 8051 Microcontroller Architecture, Programming and Application., Tata McGraw Hill.
2. Intel MCS-51,MCS96/MCS296 Data sheets

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B.E.-IV (Electronics Engg.)

Semester - VIII

EC 804 EC : Project

	Lecture	Tutorial	Practical
Teaching Hours	0	0	8
Examination Scheme Marks	-	-	Cont. Evaluation : 80 Examination : 120

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B.E.-IV (Electronics Engg.)

Semester - VIII

EC 805 EC : Seminar

	Lecture	Tutorial	Practical
Teaching Hours	0	2	0
Internal Examination Scheme Marks	-	-	Cont. Evaluation : 20 Examination : 30

EC 818 ECC INFORMATICS

[ELECTIVE 1.4, GROUP-I]

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

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

1LOCAL AREA NETWORKS (INTRODUCTION TO LAN):
IEEE 802 Protocols. B02 I (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.INTERGRATEDSERVICE DIGITAL NETWORK (ISDN):

Voice & Data Communication over Telephone Network. IDN. Introduction to ISDN. B, D & II Channels, BRI & PRI User Interfaces, Digital Subscriber Loop, Functional Grouping & Reference Points, The ISDN Layers, LAPB & LAPD Data Link Layer Protocols. X 25 Protocol, ISDN Standards & Services

5 BROADBAND ISDN..;

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

6 FRAME RELAY SERVICES :

Frame Relay Operation, Layers & Implementation.

7 ASYNCHRONOUS TRASFER MODE(ATM) :

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

8. SOMET/SD.N

Synchronous Optical Network, Synchronous Transport Signals, Physical Configuration, The SONET Layers, The SONET Frame, Multiplexing STS Frames.

REFERENCE

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

McGrawHill, 1999

2) Data & Computer Communicalion by William Sailings, McMillan, 5 edition, 1998
3) Compter Networks by Andrew S Tanembaum, PM. 3rd cdtion, 1998.

VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-IV (Electronics Engg.)

Semester - VIII

EC 819 ECC DIGITAL MESSAGE TRANSMISSION

[ELECTIVE l.6, GROUP-I]

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

- □□□□□□ Examples of analog pulse and digital transmission systems. Performance annalysis 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:

1. Wozecraft< J.M. and Jacobs 1 M.: Principless of Communication Engineering, John Wiley, 1965.
2. Carlson A: Communication Systems, 3rdod.. McGrawHill, 1986
3. Van Trees H.L.: Detection Estimation and Modulation Theory, Vol. 1 , Wiley, 1968.
4 Pioakisl.J.: Digital Communications 2nd Ed., McGiawHill, 19S9.
5. Blahut R F: Digital transmission of Information, Addison Wesley 1990
6. Benedetto S, Biglieri E. and Castellan V.. Digital Transmission Theory, Prentice Hall, 1987.

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B.E.-IV (Electronics Engg.)

Semester - VIII

ECS20ECC ADAPTIVE SIGNAL PROCESSING

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

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Internal Examination Scheme Marks	100	25	Coin. Evaluation : 00 Examination : 00

- 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;

1. S. Haykin, Adaptive tiller theory. Prentice Hall, 1986.

2 B. Widrow and S.D. Stearns, Adaptive sisn.il piocessing, Prentice Hall, I9S4.

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B.E.-IV (Electronics Engg.)

Semester - VIII

EC 828 ECC DIGITAL MICROWAVE COMMUNICATION

(ELECTIVE 2.2, GROUP-II B E IV
(Electronics & Communication Engg)

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

I. MICROWAVE LINK:

1)Antennas - Gain, Bcamwidth, Polarization, Antenna Noise, High-performance
Antennas. Antenna Towers.

2)Free Space Propagation

3)Atmospheric Effects : Absorption, Refraction, Ducting

4)Terrain Effects : Reflections, Fresnel Zones, Diffraction.

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

6)Availability : Performance Objectives.

7] Diversity ; Spate Diversity and Frequency Diversity.

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

II, DIGITAL MICROWAVE RADIQSYSTEMS :

1) System Protection . Diversity Protection Switching, Hot-stand by Protection, Combining Techniques, IF Adaptive Equalizers, Baseband Adaptive

Transversal
Equalizers.

*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.

3)Performance and Measurements . RP Section Tesjs. IF Section Tests, Baseband
Tests.

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

REFERENCE:

1. Telecommunication Transmission System by Robert G. Winch, McGraw Hill

International Editions, 1993

2. Advanced Electronic Communication Systems by Wayne Tomasi, Prentice Hall, Inc.,USA.

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B.E.-IV (Electronics Engg.)

Semester - VIII

EC 829 ECC TELECOMMUNICATION SWITCHING SYSTEM & NETWORKS

[ELECTIVE 2.3, GROUP-II]

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

1 . INTRODUCTION

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

2. STROWCEKSWITCHINGSYSTEMS :

Rotary Dial Telephone, Signaling Tones, Stronger Switching Components. Slep-by-Sicp Smtcliing, 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 DIVITlON 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

Traffic and Service Time Characterization, Blocking Models and Loss Estimates. Delay Systems.

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.

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B.E.-IV (Electronics Engg.)

Semester - VIII

EC 8 31ECC IMAGE PROCESSING
[ELECTIVE 2.5, GROUP-II]

	Lecture	Tutorial	Practical
Teaching Hours	3	1	0
Examination Scheme Marks	100	25	Cont. Evaluation : 00 Examination : 00

- 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

- Computer tomography - parallel beam projection, Radon transform, and its inverse. Back-projection operator, Fourier-slice theorem, CBP and FBP methods. ART. Fan beam projection Image communication - JPEG, MPEGs and H 26x standards, packet video, error concealment.

- 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:

l. A. K Jain, Fundamentals of digital image processing, Prtntice Hall of India, 1989.

2 R.M. Haralick, and L.G. S!iauiro, Computer and Robot Vision, Vol-1, Addison Wesley, Reading, MA, 1992.

3.R. Iain, R. Kastun and E.G. Schunck, Machine Vision, McGraw-Hill International Edition, 1995.

4.W. K. Pratt, Digital image processing. Prentice Hall, 1989.

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

6 H. C. Andrew and B. R. Hunt, Digital image restoration. Prentice Hall, 1977.