VEER NARMAD SOUTH GUJARAT UNIVERSITY

B.E.-III (Electronics Engg.)

Semester - VI

B.E.III (Electronics) 6th Semester		Teaching Scheme			Examination Scheme						
					Theory Exam University Exam.		Practical/Quiz/Viva/T.W. etc.				
							University Exam.		Tutorial	Cont. Evalua, tion	Total Marks
Course	Course No.	L Hrs.	T Hrs.	P Hrs.	Dura,tion Hrs.	Marks	Duration Hrs.	Marks			
Fundamental of Power System Satellite Communication	ELE 601 EC EC601 ECC	3	0	0	3	100	-	-		-	-
Computer Architecture and Organization	CO 602 EC	3	0	0	3	100	-	-	-	-	-
Analog Integrated Circuit	EC 603 EC	3	1	2	3	100	3	30	25	20	75
Analog and Digital Communication	EC 604 EC	3	1	2	3	100	3	30	25	20	75
Industrial Electronics	EC 605 EC	3	1	2	3	100	3	30	25	20	75
Microprocessor Systems and Applications	EC 606 EC	3	1	2	3	100	3	30	25	20	75
	TOTAL :	18	4	8	-	600	-	120	100	80	300
Total Contact Hours : 30 Total Marks : 900											

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Semester - VI

Fundamental Of Power System : ELE 601 EC

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

1. System of Transmission: Different systems of transmission, Comparison of system, Selection of conductor size & transmission voltage.
2. Overhead lines Electrical Features: Conductors. Types of conductors in use, Electrical properties, Bundled conductors, Symmetrical and unsymmetrical spacing, Equivalent spacing, Transposition, Transmission line constants, Calculation of resistance, inductance and capacitance for simple arrangement and multi-circuit lines symmetrical and unsymmetrical spacing G.M.R. of conductors, Skin effect.
3. Underground Power Cables**:** Types and construction of cables, Methods of laying, Insulation resistance, Stress and capacitance of single core cables, Capacitance of three core cables, Sheath effect, Thermal rating of cables, cables testing, faults and fault location by loop tests.
4. Short and medium Transmission Line performance: Effect of capacitance, Charging currents, Short and medium lines, Calculation by nominal T and Π methods, Regulation and efficiency.
5. Distribution**:** Distribution systems in use, Comparison of system choice of feeding points, Calculation of feeders, Kelvin's law, calculation of voltage drop in distributor and service mains, Ring mains, Use of balancer.
6. Economic Aspects of Utilizing Electrical Power: Fixed charges, Interest & sinking fund calculation, Energy cost, Public supply, Two port tariff, Effect of power factor, Measurements, Grid tariff, Reduction of energy cost, Power factor improvement, Improvement of load factor, Off peak loads, Economic choice of equipment, Initial cost & efficiency, Capitalization of losses, Choice of voltage, Cost of renewals.

References:

1. Stevenson.W.D.: Elements of power system analysis, 1990
2. Nagrath & Kothari: Power system Engineering, 1992
3. Openshaw Tayler: Utilization of Electrical Energy, 1992
4. Soni,Gupta & Bhatnagar: A textbook of Power System Engineering, 1993

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B.E.-III (Electronics Engg.)

Semester - VI

COMPUTER ARCHITECHURE AND ORGANIZATION: CO 602 EC

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

1. Basic Computer Organization And Design:, Introduction, Instruction code, Design of computer instructions, Timing and Control Design, Instruction execution, Input, Output Instruction, Interrupt, Design of Basic Computer
2. Central Processor Organization: Processor bus organization, Arithmetic Logic Unit, Stack Organization, General Instruction Format, Addressing Modes in instruction set, Data transfer instructions, Data Manipulations instructions, Program Control instructions, Microprocessor/Micro computer organization.
3. Micro Program Control Organization: Conventional control/Micro-Program control, Control memory, Address sequencing, Micro-program sequencer, Micro-instruction format, Advantages & Applications.
4. Arithmetic Processor Design: Introduction. Algorithm for Addition, subtraction, Multiplication, Division for, Unsigned number, Signed magnitude numbers, 1's Complement numbers, 2's complement numbers, Floating point numbers, Decimal numbers, Processor configuration and design for different types of number representation, Design a micro programmed calculator.
5. Input Output Organization: Peripheral devices, I/O interfaces, Synchronous data transfer, Asynchronous data transfer, software/hardware approach for data transfer, Direct memory access, Priority interrupt, I/O processor, Multiprocessor system organization.
6. Memory Organization: Auxillary memory, Microcomputer memory, Memory hierarchy, Associative memory, Virtual memory, semiconductor memories, cache memory, memory management hardware.
7. Parallel Processing: Introduction to parallel processing, multiprogramming, time sharing, Pipeline processing, parallel processing with multiple CPUs and Functional units, Race conditions, Semaphores in process, Synchronization, Memory interleaving, RISC processor, CISC processors.

References

1. Morris Mano: Computer Systems Architecture, 3 rd Edition, PHI, 1997

2. Tanenbaum: Structural Computer Organization, PHI EEE, 1995

3. W. Stallings: Computer Organization, PHI EEE ed, 1997

4. Hamacher: Computer Organization, McGraw,Hill IS ed, 1994

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B.E.-III (Electronics Engg.)

Semester - VI

Analog Integrated Circuit. : EC 603 EC

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Differential and Cascode BiCMOS Amplifiers: Differential amplifier, AC and DC analysis of different circuit configurations, Constant current bias and current mirror, Cascaded differential amplifier stages and level translator, AC and DC analysis of cascode amplifier.

2. Introduction to operational amplifier: Block diagram, Analysis of op-amp equivalent circuit, Specifications, Open loop op-amp configurations.

3. Practical Op-Amp: An op-amp with negative feedback, Voltage series and voltage shunt configurations, Differential amplifiers, Offset voltages and currents, CMRR, Slew rate.

4. General Linear Applications: Peaking amplifier, Summing, Scaling and averaging amplifiers, Instrumentation amplifier, Voltage to current converter with floating and grounded load, Current to voltage converter, Integrator and differentiator, Gyrator.

5. Active Filters and Oscillators: First order and second order low pass and high pass Butterworth filter, band, pass and band reject filters, all pass filter, Oscillators, Phase shift and Wien bridge oscillators, square, triangular and saw tooth wave generators.

6. Comparators and Converters: Zero crossing detector, Schmitt trigger, Comparator, Voltage limiters and window detector, Clippers and clampers, Peak detector, introduction to A/D and D/A converters and sample and hold circuit.

7. Specialized IC Applications: The 555 timer, Phase locked loops, ICL8038 function generator, Voltage Controlled Oscillator, XR2240 programmable timer/counter.

Practical work shall be based upon the theory course.

References :

1. Ramakant Gayakwad: Op Amps and Linear Integrated Circuits, pHI 3rd Edition 1993.
2. Laker and Sansen: Analog Integrated Circuits, McGraw Hill, IS, 1993.
3. Franco: Design With Operational Amplifiers And Analog Integrated Circuits. McGraw Hill. 2/e, 1992
4. Coughlin and Driscol: Op Amps and Linear Integrated Circuits, pHI 5th edition 1998.
5. Sedra / Smith: Microelectronic Circuits, Oxford university press, 4th edition 1996
6. Jaggar. Micoelectronics circuit design. McGraw Hill, IS, 1997

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Semester - VI

Analog and Digital Communication: **EC 604 EC**

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Spectral Analysis Parameters: Fourier Series, Power Spectral Density, Convolution, Correlation between waveforms, Auto and Cross correlation, Sampling Theorem.
2. Analog Input Analog Output Schemes: Amplitude Modulation: Equation for AM, modulation index, spectrum of AM, DSB and SSB transmission with and without carriers, VSB transmission, DSB,C amplitude modulators, Envelope detectors, Balanced Modulator, SSB signal generation and Demodulation schemes.
3. Frequency modulation: Equations for FM, modulation Index, spectrum calculation for sinusoidal waveform and Bessels function table, phase modulation, relationship between FM and PM, NBFM and WBFM, frequency modulators and demodulators (Armstrong method) Types of noise : Noise in AM and FM systems.
4. Digital Input Analog Output Schemes: ASK, FSK,QAM, BPSK, QPSK, Transmitter and receiver block diagrams.
5. Analog Input Digital Output Schemes: Various pulse modulation methods, Pulse code modulation PCM, Delta modulation DM. Comparison between PCM and DM, Compounding method, Noise in digital systems
6. Digital Input Digital Output Schemes: Line encoding methods : NRZ, RZ, Manchester, and multilevel encoding methods and comparison of these schemes
7. Source coding : Linear predictive coding, Huffman coding
8. Multiplexing : FDM and TDM systems,examples and comparison

Practical work shall be based upon the theory course.

References :

1. B.P.Lathi: Modern digital and analog communication systems. Holt,Sounders (HRW Series) Publication. 1987
2. Dennis Roddy and John Coolen : Electronic communications. Fourth Edition,PHI 1995
3. Taub and Schilling : Principles of communication. Systems. Mc,Graw Hill Publication, 1992.
4. Haykin. Communication systems. 3/E John Wiley, 1994.

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Semester - VI

Industrial Electronics: EC 605 EC

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Introduction: Scope of power electronics, power converter specification.

2. Power Semiconductor Devices: Thyristor families, V-I characteristics of SCR, Triac, GTO, Diac, Sources of thyristor triggering, turn ON/ turn OFF characteristic and Gate triggering requirements, series/parallel operation, device ratings.

3. Power transistor devices: Basic structure and V-I characteristics of power MOSFET, IGBT, SIT. Switching characteristic, Gate/Base drive circuits, Safe operating area, di/dt / dv/dt limitation, series/parallel operation, ratings.

4. Phase Control Converters : Single phase central taped transformer connection, half controlled and fully controlled Bridge configuration, three phase half controlled and fully controlled Bridge converters, Use of flywheeling diode operation with resistive, inductive and Back EMF load, line commutated inverter, effect of source inductance on converter performance, power factor, ripple factor calculation, firing scheme, linear alpha and cosine angle control, applications of D.C. motor speed control, regulated power supply, battery charger.

5. Thyristor commutation techniques: Natural commutation, Force commutation, Voltage/Current commutation, DC chopper, Principle of Voltage control, analysis of Morgan chopper circuit, Johns chopper circuit, regenerative chopper circuit.

6. Inverters: Single phase series and parallel inverters, classification of CSI and VSI inverters, single phase and three phase inverter circuit, methods of voltage controlled inverter circuits, comparison of thyristor and transistor based inverters, application to speed control of AC motors, uninterrupted power supply, induction melting,heating furnaces.

7. Power Devices Protection : Protective measure, types of Snubber circuits and their functions, Snubbers circuits for transistors and thyristors, thermal protection, design of heat sinks.

Practical work shall be based upon the theory course.

References :

1. N. Mohan: Power Electronics : Converters, Applications and Design. Wiley Publication, 2/E, 1995.

2. M.H. Rashid: Power Electronics: Circuits, Devices and Applications. PHI,2/E,1994

3. G.K. Dubey: Thyristorized Power Controllers. Wiley Eastern, 1990.

4. S.B. Doway: Power Semiconductors Circuits. John,Wiley. 1994.

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Microprocessor Systems and Applications: EC 606 EC

	Lecture	Tutorial	Practical
Teaching Hours	3	1	2
Examination Scheme Marks	100	25	Cont. Evaluation : 20 Examination : 30

1. Introduction to 16 bit Microprocessor: 8086/8088 Architecture, Machine language instructions, Internal execution and timing
2. 8086/8088 Family Assembly Language Programming: Data transfer instructions, Arithmetic instructions, Logical, shift and rotate instructions, Branch instructions, Loop instructions, NOP,HLT and flag manipulation instructions, Assembler directives.
3. 8086 System Connections And Timings: 8086 Hardware overview, Basic signal flow on 8086 buses, Analyzing a minimum mode system, 8086 addressing and address decoding, 8086 timing parameters.
4. Interrupts And Interrupt Service Procedures: 8086 interrupts and interrupt responses, 8086 Interrupt types, Hardware and software considerations for using interrupts.
5. I/O Programming: Fundamental I/O considerations, Programmed and Interrupt I/O, Block transfers and DMA, I/O design example.
6. Interfacing: Programmable parallel ports and handshake input/output, Interfacing microprocessors to keyboard and displays, D/A converter operation, Interfacing and applications, A/D converter types, Specifications and interfacing, Serial communication interfaces.
7. Introduction to Microcontrollers: Basics of 8031 and 8051 architecture and programming, introduction to 16 bit micro controllers

Practical work shall be based upon the theory course.

Reference:

1. Hall Douglas V*:*Microprocessors and Interfacing, Programming and Hardware (Tata McGraw Hill Publishing Company Limited 1991)
2. Gibson Glenn A. and Liu Yu Cheng*:* Microcomputer Systems: The 8086/8088 Family, Architecture, Programming and Design (Prentice Hall of India Private Limited, New Delhi,Second Edition,1994)
3. MCS,86 User's Manual (Santa Clara, Calif.: Intel Corporation,1993)
4. Morse, Stephen P. *:*The 8086 Premier: An Introduction to It's Architecture, System Design and Programming (Rochelle Park,N.J.: Hayden Book Company, Inc., 1989)

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Semester - VI

EC 601 ECC Satellite Communication

B.E. III (Electronics & Communication) 6th Semester

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

1. SATELLITE SYSTEM CONFIGURATIONS AND LINK CALCULATIONS :

   International and Domestic Satellite Communication Systems, Illustrative Earth Station and Satellite Communication Subsystems, System Link Model and Parameters, Link Budget Calculation of Digital Satellite System.

2. POWER-EFFICIENT MODULATION TECHNIQUES :

   Baseband Transmission System Concept, Introduction to Power Efficient Tecjmiques, Equivalence of Low- Pass and Bandpass Channel Models, Coherent and Differentially Coherent BPSK and QPSK Systems, Mininum Shift Keying.

3. SPECTRALLY-EFFICIENT MODULATION TECHNIQUES:

   Introducation, Linearly and Nonlinearly Amplified M-ray PSK and QAM Earth Station and Satellite Modems.

4. CODING FOR ERROR DETECTION AND CORRECTION :

   Introduction, Entropy, Mutual Information And Channel Capicity, Source Encoding Coding For Reliable Communication, Convolutional Codes.

5. TIME-DIVISION MULTIPLE-ACCESS SYSTEMS (TDMA) :

   introduction, basic TDMA architecture, tdma control archiotectures, tdma terminal implementation, ancillary tdma processing, terrestrial interfaces.

6. REGENERATIVE (ON-BOARD PROCESSING) SATELLITE SYSYEMS :

   Introduction, Performance, Comparision of Regenerative and Conventional QPSK Satellite Systems, On-Board-DQPSK Regenerative Satellite Systems.

7. SINGLE-CHANNEL-PER-CARRIER (SCPS) PREASSIGNED AND DEMAND-ASSIGNED, SPADE, DIGITAL SATELLITE EARTH STATIONS :

   Introduction to Frequency Division Multiple Access (FDMA) Digital Satellite System, SCPC-FDMA Digital Satellite Systems, System Capacity and Trade-offs in SPADE and SCPC Systems.

8. SATELLIE EARTH STATION ENGINEERING:

Earth Station Antenna Subsytems, Low Noise Amplifier, High Power Amplifier.

REFERENCES :

1. Digital Communicatios- Satellite/Earth Station Engineering by Kamilo Feher, Prentice-Hall Inc., USA.

2. Satellite Communications by T. Pratt and C.W. Bostian, John Wiley & Sons.

3. Satellite Communications by Gagliardi, CBS Publishers & Distributors, Delhi.
