SANT GADGE BABA
AMRAVATI UNIVERSITY

(FACULTY OF ENGINEERING & TECHNOLOGY)

PROSPECTUS

Prescribed for
Four Year Degree Course
Bachelor of Engineering
Electronics & Telecommunication Engineering
V to VIII Semester
Examinations, 2009-2010
Semester Pattern

2009

Price Rs. 12/-

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SYLLABUS

PRESCRIBED FOR
BACHELOR OF ENGINEERING
ELECTRONICS & TELECOMMUNICATION ENGG.
SEMESTER PATTERN

FIFTH SEMESTER

Inplant Training & Industrial Visit in the faculty of Engineering & Technology

1) a) the inplant training shall not be compulsory,
   b) the inplant training shall be taken by students strictly during
      Summer vacation after IVth or VIth Semester examination and /
      or during Winter vacation after Vth or VIIth Semester
      examinations,
   c) the inplant training shall not be part of examination system,
      however, student shall prepare and submit report after completion
      of training to the concerned Head of Department alongwith
      certificate issued by the industry,
   d) the inplant training shall be of minimum two weeks duration,
   e) there shall not be any liability whatsoever on the Institution with
      respect to implant training of the students,
   f) students shall undertake implant training on their own risk and
      cost. An undertaking in this regards signed by student and
      parents shall be submitted before proceeding for training to the
      concerned Head of Department/ Head of Institution.
   g) the students shall complete implant training under the supervision
      of concerned person in the industry,
   h) Institutes shall help students to organise implant training by
      way of correspondence,

2) Industrial Visit : Industrial visit may be organised for the students.
   Students should prepare & submit the report on Industrial visit
   to the concerned Head of Department/Head of Institution.

5 SUL 1 ELECTRONIC DEVICES AND CIRCUITS-II

SECTION-A

Unit I : Linear wave shaping using RC and RL circuits, analysis and
        calculations of RC low pass and high pass filters, analysis of
        clipping and clamping circuits using diodes and switching
        transistors.

Unit II : Collector coupled bistable, monostable and astable
         multivibrators, Time base generators & Sweep Generators.
         Number systems, Gray codes, Arithamtic operations, 2’s
         compliments, floating point arithmetic and its representation.

Unit III : Switching characteristics of semiconductor devices : Diode
          as switch, transistor as a switch, characteristics and analysis,
          FET as a switch, characteristics, JFET, CMOS, switching
          speed of devices : Shottkey diode, transistor, Logic gates,
          Boolean Algebra.

SECTION-B

Unit IV : Study and analysis of Digital Logic Families : RTL, DTL, HTL,
         TTL, ECL, IIL, CMOS, and their characteristics, tri-state logic,
         5400/7400 TTL series.

Unit V : Flip-flops : R-S, J-K, Master slave J-K, D-type, T-type; registers
        and counters, adders and subtractors using logic gates, brief
        review of ADC and DAC techniques.

Unit VI : Types of semiconductor memories, sequential memories, 2
         and 4 phase ratioless shift registers, CMOS register stages,
         static shift registers, implementation of ROM (ROM, PROM,
         EPROM, EEPROM) BJT, RAM cell, MOS-RAM, CCD
         memories.

PRACTICALS : Minimum 8 practicals based on above syllabus, preferably
              uniformly distributed.

BOOKS RECOMMENDED :

1) Jacob Millman & Herbert Taub : “Pulse Digital & Switching


   1998.


5) Mathur S.P. and Chada P.R. : “Electronics Devices, Application and
   Integrated Circuits”, New Delhi, Umesh Publications, 1985, (IV Ed.)

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SECTION-A
Unit I: SCR, Triac, Diac-construction, characteristics & applications, two transistor analogy for turning ON-OFF SCR, turn ON mechanism, different methods of turning ON-OFF SCR, turn OFF mechanism, Thyristor firing circuits. Introduction to GTO, power transistor, power MOSFET & IGBT & their construction & characteristics.

Unit II: Series parallel operation of SCR’s, static & dynamic equalising ckt., equalisation of current in parallel connected SCR’s, string efficiency, derating factor, Protection of SCR’s against di/dt, dv/dt, radio freq., interference, over voltage, over current.

Unit III: Principle of phase control, half wave controlled rectifier, half controlled bridge & fully controlled bridge rectifier for resistive and RL load derivation for output voltage and current, effect of free wheeling diode, single phase dual converters.

Three phase half controlled bridge and fully controlled bridge rectifier. (only descriptive approach)

SECTION-B
Unit IV: Classification of ckt. for forced commutation, series inverter, improved series inverter, parallel inverter, output voltage and waveform control, principle of operation for three phase bridge inverter in 120 deg. and 180 deg. mode, single phase transistorised bridge inverter.

Unit V: Basic principles of chopper, time ratio control and current limit control techniques, voltage commutated chopper ckt., Jones chopper, step-up chopper and AC chopper.

Basic principle of cycloconverters, single phase to single phase cycloconverter.

Unit VI: Speed control of DC series motors using chopper, speed control of DC shunt motor using phase controlled rectifiers, speed control of three phase induction motor by stator voltage control, v/f control and slip power recovery scheme.

Static ckt. braker, UPS, fan speed regulator, principle of soft start ckt. Zero Voltage Switch.

PRACTICALS: Minimum 8 practicals based on above syllabus, preferably uniformly distributed.

REFERENCES:
1) M. Ramamoorthy - Thyristor and their application.
2) M.H.Rashid - Power Electronics Ckts., Devices and Application.
3) Dr.P.S. Dhimbra - Power Electronics.
4) P.C.Sen - Power Electronics.
5) H.C.Rai - Industrial and Power Electronics.
7) M.D.Singh & K.B.Khanchandani - Power Electronics, Tata McGraw Hill.

*****

SECTION-A
Unit I: Principles and Techniques of Management : Meaning of and differences among business, management, administration and organisation, Principles of management, functions of management, planning, organisation structure and relationships, direction, co-ordination, control, motivation, delegation and decentralisation, communication, leadership and decision making.

Unit II: Market and Materials Management :
A) Marketing strategy, market research, consumer behaviour, advertising and sales promotion, channels of distribution, pricing of products.
B) Classes of material, scope of material control, scope of purchasing department, purchasing procedures, order procedures, inventory control, introduction to production, planning and control.

Unit III: Personnel Management :
Meaning and functions of personnel management, recruitment, selection, promotion, wages and salary administration, training and development, functions and scope of trade unions in Indian industries. Welfare of labour, Problems of labour turn over & retention.
SECTION-B

Unit IV : Project and Financial Management :

A) Case studies of project report, preparation of profit and loss statement and balance sheet, ratio analysis.
B) Principles of costing, cost sheet preparation, variance analysis, meaning and application of various budgets, types of budgets and their importance.

Unit V : Quality Control :

Concept of quality and quality control, elements of quality, factors controlling quality of design and conformance, process control, inspection planning and scheduling, 7 QC (Seven Quality Control) techniques, vendor inspection, sampling inspection, sampling plans, Quality audit system.

Unit VI : Quality Management :

Concepts and applications of Kaizen, quality circle, ISO 9000 series, just-in-time, quality planning and total quality management, elements of TQM, Quality Circles.

TEXT BOOKS :

2) Khanna O.P. : Industrial Engineering and Management.

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5 SUL 4 COMMUNICATION ENGINEERING-I

SECTION-A


Unit II : FM Receivers : TRF receiver, Superhetrodyne receiver, Details of each block such as RF amplifier, mixer oscillator, IF amplifier, Diode detector, Audio Amplifier. Need and type of AGC, Practical Radio Receiver Circuit with AGC, Characteristics such as selectivity, sensitivity, fidelity communication receiver.


SECTION-B

Unit IV : FM Receivers : Details of FM receiver, blocks such as R.F. amplifier, local oscillator, IF amplifier, Mixer, Audio Ampl., AGC, Limiter, FM Discriminator, Single Slope and Balanced slope detector, Analysis of Foster seeley and ratio detectors, Stereo FM receiver.

Unit V : Monochrome TV : Basic television system, simultaneous sound and picture transmission, scanning process, composite video signal, signal transmission and channel bandwith, camera tubes, TV receiver; Block diagram and functional requirements, Basic concept of colour TV.

Unit VI : Satellite Communication : Orbital satellites, Geostationary Satellites, Orbital patterns, Look angles, satellite system link models, Transponder, Up link, Down link, cross link, satellite system parameters, Radiated power.

PRACTICALS : Minimum 8 practicals based on above syllabus, preferably uniformly distributed.

BOOKS :

2) Young P.H. : Electronics Communication Techniques, Columbus, A Bell and Howell Co. (First Edition)
5) Beck, Robert and J. Schoen : Electronics Communication, Modulation
5 SUL 1  CONTROL SYSTEM ENGINEERING

SECTION-A

Unit I : Basic definition; closed and open loop systems; transfer function, block diagrams, derivation of transfer functions of physical systems, signal flow graphs, basic control action.

Unit II : Time Response Analysis, Impulse response function, Analysis of first, second & higher order systems, stability of control system, Routh Hurwitz’s stability criterion, static and dynamic errors coefficients, errors criteria.

Unit III : Introduction of Root Locus method; Root Locus plots, Rules for constructing root loci, stability analysis of systems using Root locus, concept of dominant, closed loop pole pair, Root-contour plots, effect of zeros & poles.

SECTION-B

Unit IV : Introduction of frequency response, Bode plots, stability margins on the Bode plot, stability analysis of systems using Bode plots, polar plots, Nyquist stability criterion, relative stability.

Unit V : State Space representation of systems, conversion of state variable models to transfer functions, conversion of transfer functions to state variable models, solution of state equations, concepts of controllability and observability.

Unit VI : Sample Data Control Systems: Representation of sampled data (Discrete) systems, review of Z-transforms, Sampler and hold ckt., Zero order hold, sampling theorem, Z-transform analysis of sampled data of Sampled data control systems (open & closed loop systems), Z transform of systems. Solution of difference equation by Z-transform methods. Response of discrete systems. Pulse Transform functions of open loop, closed loop systems with different sampler locations. Digital controller & its transfer functions Stability analysis of discrete time system using bilinear transformation.

BOOKS :

1) K. Ogata : Modern Control Engg. (PHI)
2) M. Gopal : Digital Control Systems Principles & Design (TMH)

SIXTH SEMESTER

6 SUL 1  COMPUTER ORGANISATION

SECTION-A

Unit I : DESIGN METHODOLOGY:
Introduction of system modelling, design levels, Register level design methodology and design methods. Processor level design methodology and design techniques, queueing models, simulation.

Unit II : PROCESSOR DESIGN:
Processor organisation, information representation, number formats, Instruction sets and its implementation. Arithmetic operation, ALU design, Floating point arithmetic.

Unit III : CONTROL DESIGN:
Introduction to instruction sequencing and instruction interpretation, Hardware control, Design methods, Microprogrammed control, control design.

SECTION-B

Unit IV : MEMORY ORGANISATION:
Concept of virtual memory, Memory hierarchies, Main memory allocation, Replacement policies, segments and pages, file organisation, High speed memory, interboard memories, Cache memories, Associative memories.

Unit V : PARALLEL PROCESSING:
Basic concepts, types of parallel processors and performance considerations.
Pipeline processor : Pipeline types, design, structures, Multiprocessors : Types, performance, parallel programming, Multiprocessor Architecture.
Unit VI: ADVANCED PROCESSORS:
Architecture, organisation and features of Pentium, Power PC-620 processors.

BOOKS RECOMMENDED:

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6 SUL 2  INTRODUCTION TO MICROPROCESSORS

SECTION-A


Unit II: Assembly Language Programming of 8085, Stack, Subroutine. Address space partitioning schemes: Memory mapped I/O and I/O mapped I/O, Address decoding techniques.

Unit III: Internal architecture, programming and interfacing of 8255, 8259, 8279.

SECTION-B

Unit IV: Data Transfer Schemes: Interrupt driven (Interrupt system of 8085, software and hardware interrupts), Serial data transfer through SOD and SID. Introduction to DMA data transfer.

Unit V: 8086: CPU architecture, internal operations, Addressing modes, instruction formats, Execution timing.

Unit VI: Instruction set of 8086, Assembly language programming (ELEMENTARY PROGRAMMING) Assembly Directives, Operators.

PRACTICALS: Minimum 8 practicals based on above syllabus, preferably uniformly distributed.

BOOKS RECOMMENDED:

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6 SU 3  COMMUNICATION ENGINEERING-II

SECTION-A

Unit I: ANALYSIS

Unit II: PROBABILITY AND RANDOM SIGNAL THEORY

Unit III: NOISE IN CW MODULATION
Mathematical Representation of Noise, AM Receivers, Signal-To-Noise Ratio, SNRs of SSB-SC, DSB-SC, and DSB-FC systems, FM Receivers, Noise in FM Reception, FM Threshold Effect, Comparison of AM and FM

SECTION-B

Unit IV: PULSE MODULATION
The sampling theorem, Sampling of Band-Pass Signal, Quantization and types of quantization, Practical aspects of sampling, Reconstruction of message Process from its
Samples, Time Division Multiplexing, Pulse Amplitude Modulation, Pulse Time Modulation, PCM, DM.

Unit V : TELEPHONE SWITCHING TECHNIQUES
Introduction to Switching System, Pulse dialling, Touch tone dial telephone, Space Division Switching SPC, Centralized and Distributed SPC, Time Division Switching : Basic Time Division space switching, Time Division time switching, Time Multiplexed space switching, Time Multiplexed time switching, EPABX.

Unit VI : FIBER OPTIC COMMUNICATION
Introduction, Principle of light transmission in fiber, losses in fiber, Introduction to light sources and photodetector, splicing techniques, fiber optic transmission system.

PRACTICALS : Minimum 8 practicals based on the above syllabus, preferably uniformly distributed.

TEXT BOOKS RECOMMENDED :
6) S.S.Das : Electronic Telephony.

6SUL4 NUMERICAL METHODS AND OPTIMIZATION TECHNIQUES

SECTION-A
Unit I : Error Analysis, Absolute, relative and percentage errors. A general error formula and error in series approximation, Solution of Non linear and polynomial equations : False position, modified false position, secant, Newton Raphson methods, Convergence and error properties of the above methods.

Unit II : A) Solution of Linear Systems of Equation :
B) Curve fitting : Least Square Method.


SECTION-B

Unit IV : Operations Research Models and Dynamic Programming :
Operations research models : classification of problems, phases of operation research, scope and limitation of operations research.
Dynamic programming : Multistage decision process, concept of sub-optimization and Bellman’s principle of optimality, conversion of final value problem into an initial value problems.

Unit V : Linear and Non Linear Programming
Linear programming - formulation of problems, simplex method, artificial variable technique, two phase simplex method, concept of duality, transportation problems.
Non linear, programming - random search method, pattern search method, Steepest Descent method.

Unit VI : PERT and CPM : Pert Networks, ET, TE, TL, SE and Critical path, Probability of completion.
Decision theory : Introduction, Minimax decision procedure, Baby decision procedure with and without data, Regret function Vs. Loss function.

TEXT BOOKS :-
6 SULI 5

LINEAR INTEGRATED CIRCUITS

SECTION-A

Unit I : Operational Amplifier

Differential amplifier : gain expressions using H parameters, transfer-characteristics, constant current source, level shifting, block diagram of op-amp, frequency response, frequency compensation methods, study of ICs uA741, measurement of parameters of op-amp and offset nulling and their importance.

Unit II : Linear Applications of Op-Amp

Inverting and non inverting amplifiers, voltage followers (AC-DC), integrator, differentiator, differential amplifier, bridge amplifier, instrumentation amplifiers, precision rectifiers, RMS to DC converter, voltage to current converter, sinusoidal RC oscillators, constant voltage sources, frequency to voltage and voltage to frequency converter.

Unit III : Non Linear Applications of Op-Amp and Filter Circuits

Clipping and clamping circuits, comparator, astable, monostable and bistable multivibrator, Schmitt trigger, voltage sweep generator, active filters : Butterworth, Chebyshev filters using op-amp, log and antilog amplifiers

SECTION-B

Unit IV : Voltage Regulator

Block schematic of regulator IC 723, regulated power supply using IC 723, short circuit protection, switch mode power supply, dual tracking regulators, regulator using 78**, 79**, and LM 317.

Unit V : 1. Timers:

Block schematic of IC 555, application of timer 555 as astable, monostable and bistable multivibrators, delayed timer, sawtooth generator, FSK modulator.

2. Sample & hold circuit, basics of analog multiplexer.

Unit VI : 1. PHASE LOCKED LOOPS

Operation of phase lock loop system, transfer characteristics, lock range and capture range, study of PLL IC-LM 565 and its applications as AM detector, FM detector and frequency translator.

2. Analog Multiplier : IC 1496

PRACTICALS : Minimum Eight practicals based on the above syllabus, preferably uniformly distributed.

BOOKS RECOMMENDED :-


5) Application Node on IC : BEL India.


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6 SULIMETX 6

COMMUNICATION SKILLS

Unit I : Comprehension over an unseen passage.

Comprehension - A - word study :-

Synonym, antonym, meanings, matching words, adjectives, adverbs, prefix and suffix, correct forms of commonly misspelled words, understanding of the given passage.

Comprehension - B - Structure study :-

Simple and compound sentences, types of conjunctions, singular and plural, tenses and their effect on verb forms.

Use of - not only - but also, if clause, since, may, can, could,
would, too etc.

Active and passive forms, negative and interrogative, punctuation and capitalization. (10 Hours)

Unit II: Theoretical background - importance of communication, its process, model of communication its components & barriers.

Verbal communication, its significance, types of written communication, organization of a text (Titles, summaries, headings, sequencing, signaling, cueing etc.), Important text factors (length of paragraph, sentences, words, clarification and text difficulty). Evaluation of written communication for its effectiveness and subject content.

Non-verbal communication, types of graphics and pictorial devices. (10 Hours)

Unit III: Specific formats for written communication like - business correspondence, formal reports, technical proposals, research papers and articles, advertising and graphics. Format for day-to-day written communication like applications, notices, minutes, quotations, orders, enquiries etc.

Oral communications - Important objectives of interpersonal skills, (verbal and non-verbal), face to face communications, group discussion and personal interviews.

Methodology of conduction of meetings, seminars, symposia, conference and workshop. (10 Hours)

BOOKS RECOMMENDED:
2) Christie Wright (Editor) : Handbook of Practical Communication Skills, Jaico Publishing House.
4) F.Frank Candlin : General English for Technical Students, University of London Press Ltd.

COMMUNICATION SKILLS LABORATORY

Objective:

On completion of this laboratory the candidate should be able to demonstrate adequate skills in oral and written communication for technical English language, actively participate in group discussions and interviews and exhibit the evidence of vocabulary building. Candidates should be assessed through continuous monitoring and evaluation.

The sample list of experiments is given below. This list can be used as guideline for problem statements but the scope of the laboratory should not be limited to the same. Aim of the list is to inform about minimum expected outcomes.

1. Assignments and tests for vocabulary building
2. Technical report writing
3. Group discussions
4. Interview techniques
5. Projects and tasks such as class news letter
6. Writing daily diaries and letters
7. Interactive language laboratory experiments.

TEXT BOOK: Norman Lewis : Word Power Made Easy

http://www.teachingenglish.org.uk

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**GRAND TOTAL**: 650

**SEMESTER : SIXTH**

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**GRAND TOTAL**: 725
### APPENDIX-D

**FOUR YEAR B.E. DEGREE COURSE**

**ABBRIVATIONS :-**
- **S** - SEMESTER PATTERN
- **U** - ELECTRONICS & TELE.
- **L** - INDUSTRIAL ELECTRONICS

**BRANCH :** ELECTRONICS AND TELECOMMUNICATION

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**GRAND TOTAL : 650**

**Elective-I:**
1) Fuzzy Logic & Neural Network
2) Fibre Optic Communication
3) Biomedical Engineering
4) Process Control & Instrumentation
5) Robotics & Automation

**SEMMESTER : EIGHTH**

**BRANCH :** ELECTRONICS AND TELECOMMUNICATION

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**GRAND TOTAL : 650**

**Elective-II :-**
1) Digital Image Processing
2) Satellite Communication
3) Advanced Microprocessor
4) Wireless Communication

*8SU5*  
1. College Assessment  
   a) Project 50\% 75\%  
   b) Seminar 25\% 150\%  
2. University Oral Exam. 75\%
SEVENTH SEMESTER

7SU1 DIGITAL COMMUNICATION

UNIT-I : DIGITAL COMMUNICATION SYSTEM
Elements of digital communication system, source encoder, decoder, channel encoder, decoder, modulator, demodulator, Line coding, Synchronization : Clock synchronization and carrier synchronization . (9)

UNIT-II : DISCRETE COMMUNICATION CHANNEL
Measure of information, Entropy and information rate of independent and dependent sequences, Source encoding, Shannon’s Encoding algorithm, Huffman encoding algorithm, discrete communication channel, capacity of discrete communication channel. Shannon’s theorem on channel capacity. (9)

UNIT-III : DIGITAL MODULATION TECHNIQUES
Digital carrier modulation schemes, binary ASK, PSK, FSK coherent scheme, probability of errors, comparison of digital modulation systems, Basics of DPSK, QPSK, MSK. (9)

UNIT-IV : ERROR CONTROLLING AND CODING
Introduction to error control coding, methods of controlling errors, type of errors and code, linear block codes, Matrix description of linear block code, error detection and error correction capabilities of linear block code, cyclic code, cyclic code. (9)

UNIT-V : BASE BAND TRANSMISSION
Base band PAM system, inter symbol interference, Nyquist criteria, pulse shaping, equalization, eye diagram, synchronization, scrambler and unscrambler, Duo binary signaling scheme . (9)

UNIT-VI : MODERN TECHNIQUES OF COMMUNICATION
Introduction to mobile communication, cellular mobile telephone architecture, frequency assignments, frequency reuse, cell splitting, call initialization, call termination, handover. Multiple access schemes : TDMA, FDMA, CDMA, spread spectrum communication, D.S. spread spectrum, frequency hoping spread spectrum, comparison. (9)

TEXT BOOKS:

REFERENCE BOOKS:

7SU2 MICROPROCESSOR PERIPHERALS AND MICROCONTROLLER

UNIT-I : Hardware and Software development aids : Logic analyser, in-circuit emulator, simulator, one pass and two pass assembler, Cross assemblers, linker, loader, compiler, cross compiler, Introduction to operating system : Definition, types and functions.
Bus standards : Serial RS 232, Parallel IEE-488 (8)

UNIT-II : Interfacing Devices with 8085 : Architecture and programming of programmable DMA CONTROLLER 8237, Programmable interval timer/counter 8253, Architecture and functioning of programmable floppy disk controller 8272. (9)

UNIT-III : Computer Peripherals and Interfacing : CRT controller 8275, Architecture and function of programmable dot matrix printer controller 8295, USART 8251. (9)

UNIT-IV : Analog to Digital and Digital to Analog Conversion Techniques: Case study of ADC 0809, ADC 1210, DAC 0808, 1008 and their interfacing with microprocessor. Use of ADC in applications like measurement of temperature, flow, speed, pressure, capacitance, inductance and resistance. (10)

UNIT-V : An Introduction to uC 8051: Architecture of 8051, Signal description of 8051, Register set of 8051, Timer structure and their mode and I/O port structure. (10)
UNIT-VI : Instruction set of 8051, Addressing modes of 8051, Memory and I/O addressing by 8051, Programming using 8051. Study of microcontroller based system. (8)

Practicals: Eight experiments should be based on above syllabus.

TEXT BOOKS:

REFERENCE BOOKS:
1. National Semiconductor : Data Acquisition Linear Devices Data Book.
2. Embedded Microcontrollers and Processors:-Volume-I-Intel
3. 8085/8086 Microprocessor Book-Intel.
4. Intel Peripheral Devices Data Book.
5. B.B.Brey : The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Pro Processor (4/e)

UNIT-VI DIGITAL SIGNAL PROCESSING

UNIT-I : Introduction to DSP, Frequency domain description of signals & systems, Discrete time sequences systems, Linearity unit sample response, Convolution, Time invariant system, Stability criteria for discrete time systems, Solutions of linear difference equations. (9)

UNIT-II : Introduction to Fourier transform of Discrete Time Signal and its properties, Inverse Fourier transform, Sampling of continuous time signal, reconstruction of continuous time signal from sequences, Z-transform and its properties, complex Z-plane, ROC determination of filter coefficients, relationship between Fourier transform and Z-transform, inverse Z-transform. (12)

UNIT-III : DFT and its properties , Circular convolution, Linear convolution from DFT, FFT, Decimation in time and frequency algorithm. Introduction to wavelet transform. (10)
UNIT-III : Combinational logic design using ROM array, PLA, PAL, preliminary design concepts using FPGA's N-bit binary adder using 7480, Look-ahead carry adder construction. (8)

UNIT-IV : Design of counter and sequential networks: Analysis of clocked sequential networks, General models of sequential machines, Equivalence and minimization networks, Deviation of state graph and tables, reduction of state assignments, S.M.Chart. (08)

UNIT-V : Analysis of asynchronous sequential networks, derivation and reduction of primitive flow tables, state assignments and realization of flow tables, hazards, asynchronous sequential network design. (8)

UNIT-VI : Fault detection and location in combinational circuits: Path sensitizing method, Equivalent - Normal-Form (ENF) method, Two-level fault detection. Fault detection and location in sequential circuits using circuit test approach. (09)

Practicals: Eight experiments should be based on above syllabus.

TEXT BOOKS:

REFERENCE BOOKS:
1. Fleatcher : An Engineering approach to Digital System Design 
3. Digital IC reference data manual

7SU5/7SL5/7SI5 ELECTIVE-I

(1) FUZZY LOGIC AND NEURAL NETWORKS

UNIT-I : Introduction:
Biological Neurons and their artificial models, introduction to neural computing, Components of neuron, input and output weight, threshold, weight factors, transfer functions, concepts of supervised and unsupervised learning. (8)

UNIT-II : Supervised Learning:
Single layer network, perceptron, Linear separability, Training algorithm and limitations.

UNIT-III : Unsupervised Learning:
Introduction, Counter propagation networks, Kohonen’s self organizing maps, Hopfield networks. (8)

UNIT-IV : Introduction : Uncertainty in information, basic concepts of Fuzzy sets, operations on fuzzy sets, properties.
Fuzzy relations : operations, properties, value assignments. (8)

UNIT-V : Membership functions:
Features, fuzzification, membership value assignments, Fuzzy Rule based systems, Graphical technique of inference.
Defuzzification : Lambda-cuts for Fuzzy sets and Fuzzy relations, Defuzzification methods. (9)

UNIT-VI : Applications:
1. Fuzzy pattern Recognition - feature analysis, partitioning of feature space, single sample identification multifeature pattern recognition.
2. Simple Fuzzy logic controller - Control system design stages, Assumptions in a Fuzzy control system design, general fuzzy logic controllers, simple examples.

TEXT BOOKS:
REFERENCE BOOKS

7SU5/7SL5 ELECTIVE-I (2) FIBER OPTIC COMMUNICATION

UNIT-I: OPTICAL FIBER WAVEGUIDE:
Total internal reflection, Snell’s law, Theory of circular wave guide, Modes in optical fibres, Single mode fibre, multimode fibre, N.A., power flow. (8)

UNIT-II: TRANSMISSION CHARACTERISTICS OF FIBER:
Attenuation, absorption losses, scattering losses, bending losses, dispersion, intra model - intermodel dispersion, bandwidth. Nonlinear effects in single-mode fiber. (8)

UNIT-III: OPTICAL SOURCES:
Optical emission from semiconductors, LED, power, efficiency, double heterojunction LED, Basic concept of Lasers, Semiconductor injection lasers. (8)

UNIT-IV: OPTICAL FIBERS:
Manufacturing, fiber splicing and connectors different manufacturing techniques, diff. splicing tech. and connectors. (8)

UNIT-V: DETECTORS:
Optical detection principle, absorption, quantum efficiency, responsivity, PIN photo diode, APD and noise in photodiode. MSM Photodetectors. (8)

UNIT-VI: OPTICAL ELECTRONICS SYSTEM:
Optical transmitter, receiver, digital system planning consideration, power budgeting coherent and noncoherent systems, modulation and demodulation scheme, wavelength multiplexing, Optical switches. (8)

TEXT BOOKS:

REFERENCE BOOKS:

7SU5 /7SL5 ELECTIVE-I (3) BIOMEDICAL ENGINEERING

UNIT-I: INTRODUCTION TO BIOMEDICAL ENGINEERING
Physiological system of heart, Man instrument system, Sources of bioelectric potentials, Different bioelectric signals like ECG, EMG and EEG, Biopotential Electrode theory, Basic electrode, Electrodes for EEG, ECG, EMG, Biochemical electrodes. Skin contact Theory: skin contact impedance measurement of skin con tact impedance, motion artifacts, nearest equation Nearest Equation. (9)

UNIT-II: BIOMEDICAL RECORDER AND MEASUREMENT
Biomedical recorders for EEG, ECG, EMG, Blood pressure variation as a function of time, relationship of heart sounds to a function of the cardio vascular system, Measurement of Blood Pressure (Direct & Indirect), Blood flow, Heart sound. (8)

UNIT-III: MEDICAL IMAGING SYSTEM
Instrumentation for diagnostics X-ray, X-ray basics properties, X-ray machine, Special imaging technique. Ultrasonic imaging system: Physics of Ultrasound, Biological effect of ultrasound. Ultrasonic A-scan, M-scan, B-scan, Real-time ultrasonic imaging systems. (8)

UNIT-IV: THERAPEUTIC EQUIPMENTS
Need of Physiological and electrotherapy equipments. Cardiac
pacemaker machine, Cardiac Defibrillators, Nerve and Muscle stimulators. Diathermy : short wave, microwave, ultrasonic.

UNIT-V : PATIENT CARE AND MONITORING AND SAFETY

UNIT-VI : COMPUTERS IN BIOMEDICAL ENGINEERING
Computerized Axial Tomography (CAT)
Computerized Aided ECG analysis
Computerized patient monitoring system.
Computerized Catheterization.

TEXT BOOKS:

REFERENCE BOOKS:
3. Carr and Brown : Biomedical Equipment Technology.

7SU5 ELECTIVE-1

(4) PROCESS CONTROL & INSTRUMENTATION

Dynamic elements in control loop, single capacity and multicapacity process, interacting and noninteracting elements, Concepts of Gains and its types

Complex Control Actions : Feed back control, Ratio control systems, Split range control, Cascade control, Selective control, Feedforward control, Adaptive control.

UNIT III : Multivariable process control : Choosing controlled variables, pairing controlled and manipulated variables, coupling and decoupling control systems.
Control Valves : Classification, characteristics, Determination of effective characteristics, selection of control valves.

UNIT IV : Digital Control: Discrete state control system, Relay controllers, Programmable logic controllers: structure of PLC, basics of ladder diagram, applications of PLC, Digital control schemes, Data input, Control algorithms, Digital electronic methods.

UNIT V : Computer Based Process Control: Data logging, SCADA (supervisory control & data acquisition) and case studies, DDC (direct digital control) and case studies, Process control networks.

UNIT VI : Typical process control :
Control of pumps, heat exchangers, furnaces, distillation columns, steam boilers, pH and chemical reactor.
Process instrumentation for : Steel plant, paper and pulp industries.

TEXT BOOKS:

REFERENCE BOOKS:
ELECTIVE-I

(5) ROBOTICS & AUTOMATION


Robot control fundamentals : The Artificial intelligence view point, comparison of human brain and computer in the context of intelligent bahaviour, problem representation in A.I. system problem solving technique in A.I.  

UNIT-II : Definition of knowledge, Domain and logic : Elements of logic, proportional calculus, predicate calculus, pros and cons of logic, production system and their basis elements, sentient Nets and their characteristics, Frames, A Brief about Expert system comparison of various methods of knowledge representation. 


UNIT-VI : Various Root Programming Languages and their characteristics, characteristics of Robot Task Level language, comparison of Robot programming language, features of the high level languages used in conventional programming language, featuring with the high level language used in conventional programming. 

TEXT BOOKS :-

REFERENCE BOOKS :-
1. Klafferetal : “Robotics”

EIGHTH SEMESTER

8SU1 UHF & MICROWAVES

UNIT-I : MICROWAVE TUBES : 
Two cavity and reflex klystron, magnetron, TWT, noise in microwave tubes.  

UNIT-II : SEMICONDUCTOR MICROWAVE DEVICES AND APPLICATIONS : 
Varactor diode, step recovery diode, parametric amplifiers, tunnel diode, gunn diode, negative resistance amplifier, PIN diode, IMPATT & TRAPATT diodes, MASAER’S. 

UNIT-III : TRANSMISSION OF MICROWAVES : 
Field analysis of transmission line, Rectangular wave guide , (TE and TM modes), Striplines- Microstrip lines characteristics, impedance losses in microstrip lines, types of strip lines. 

UNIT-IV : WAVE GUIDING SYSTEM (PASSIVE COMPONENTS) : 
Microwave passive components, terminator, Attenuator, phase changer, directional coupler, hybrid junction, microwave propagation in ferrites, devices employing Faraday rotation Scattering matrix formulation for N port junction. 

UNIT-V : MICROWAVE RESONATORS AND FILTERS : 
Basic Resonant circuits RLC, transmission line resonators, Fabry perot resonator, rectangular and circular cavities and
their Q. Transmission line filter, quarter wave & direct coupled cavity filter. (8)

UNIT-VI : PRINCIPLES OF MICROWAVE COMMUNICATION
Microwave link, tropospheric scatter link, line of sight system (Ground base)
Microwave absorption in atmosphere (fading). Noise in microwave communication system. (8)

Practicals: Minimum 8 practicals based on syllabus

TEXT BOOKS:

REFERENCE BOOKS:
2. K.C. Gupta : “Microwave Engg.”, (WEL)
3. Reich, Scolinik, Ordung, Krangs : “Microwave Principles”, PHI

8SU2 ELECTRONIC CIRCUIT DESIGN
UNIT-I : Design of regulated power supply using transistor as a regulated power supply, design of DC amplifier, comparator, window detectors, scaling and summing amplifier using IC 741 / IC 3245 or equivalent. (8)

UNIT-II : Design of waveform generator using IC 741, IC 8038, IC 566, IC 555. Design of sweep generator, voltage controlled oscillator. Design of first and second order filters, design of notch filter. (8)


UNIT-IV : Introduction to CMOS / VLSI Circuits, MOS transistor switch, realization of universal gates and compound gates using MOS transistors, Fundamentals of circuit characterization and performance estimation, basics of R, L and C estimation, CMOS circuits and Logic design, transistor sizing, basic physical design of simple logic gates. (9)

UNIT-V : Introduction to VHDL, Behavioral Modeling, sequential processing, data types, attributes, configurations, synthesis and synthesis issues, RTL simulation, place and route. Introduction to VERILOG. (9)

UNIT-VI : Design of combinational blocks such as multibit address, ALU, MUX, DEMUX , encoders, decoders, Design of sequential circuits, asynchronous and synchronous design issues, state machine modeling (moore and mealey machines). (9)

Practicals: Minimum Eight Practical based on the above. Using Hardware/Software.

TEXT BOOKS:
1. R.A. Gayakwad : “OP-AMP and Linear Integrated Circuits”
2. J. Bhaskar : “VHDL Primer”, (Person Education)

REFERENCE BOOKS:

8SU3 COMMUNICATION NETWORK
UNIT-I : Introduction to communication network, types of network - LAN, MAN, WAN, layer architecture, OSI reference model, LAN topologies- Bus, ring, star. Introduction to Circuit switching, packet switching and message switching. (8)

UNIT-II : Overview of transmission media :
Point to point protocol and links: ARQ retransmission strategy, selective repeat ARQ, sliding window, framing and standard data link control protocol - HDLC, SDLC, LAPD, queuing models in communication network. (8)
UNIT-III : Multiple access protocol:
Channel allocation, LAN access techniques, Random access methods, ALOHA, slotted ALOHA, CSMA, CSMD/CD, control access scheme, token ring, token bus, Performance modelling and analysis. (8)

UNIT-IV : Networking devices and routing techniques:
Hubs, repeaters, bridges, routers, gateways, switches and routing switches, routing algorithms: Fixed routing, random routing, flooding and adaptive routing (8)

UNIT-V : Network architecture and connecting services: Ethernet, X.25, frame relay, FDDI, Introduction to SONET / SDH, Introduction to ISDN and Broad band ISDN, ATM. (8)

UNIT-VI : TCP/IP Protocols
Overview of TCP/IP, UDP, IP address type, IP addressing and related issues, IP address resolution techniques, IP datagram and datagram forwarding. (8)

TEXT BOOKS:
1. Andrenes S. Tanenbaum : “Computer Networks”, PHI

REFERENCE BOOKS:

8SU4 /8SL4 ELECTIVE-II
(1) DIGITAL IMAGE PROCESSING

UNIT-II : Image Transforms:
Introduction to the Fourier Transform, DFT, Properties of Two Dimensional Fourier Transform, FFT, Hadamard, Harr DCT, Slant Transform. (8)

UNIT-III : Image Enhancement:
Basic Techniques, Enhancement by point processing, Spatial Filtering, Enhancement in Frequency domain, histogram based processing, homomorphic filtering. (8)

UNIT-IV : Image Restoration:
Degradation model, Diagonalisation concept, Algebraic approach to Restoration.
Inverse filtering, Weiner (CNS) filtering Restoration in Spatial domain, Basic morphological concept, morphological principles, binary morphology, Basic concepts of erosion and dilation. (9)

UNIT-V : Image Compression:
Fundamentals, Image compression models, Elements of Information theory, Lossy and predictive methods, vector quantization, runlength coding, Hauff coding, and lossless compression, compression standards. (9)

UNIT-VI : Image Segmentation:
Detection of discontinuities, Edge Linking and boundary detection, Thresholding, Regional oriented Segmentation. (8)

TEXT BOOKS:

REFERENCE BOOKS:
1) A.K.Jain : “Digital Image Processing”, PHI

8SU4 ELECTIVE-II
(2) SATELLITE COMMUNICATION
UNIT-I : Satellite frequency bands, Satellite types – LEO, MEO, GEO, HEO Communication satellite system, orbit, modulation, transmission and multiplexing. (8)
UNIT-II: Orbital aspects of satellite communication: Orbital period and velocity, Effects of orbital inclination, azimuth and elevation, converge angle and slant range. Orbit determination, orbital effects in communication, system performance. (9)

UNIT-III: Satellite channel: Electromagnetic field propagation, antennas, Atmospheric losses, receiver noise, carrier to noise ratio, satellite link analysis, Frequency reuse and depolarisation. (8)

UNIT-IV: Satellite Transponder: The transponder model, satellite front end, satellite signal processing, transponder limiting, nonlinear satellite amplifier. (8)

UNIT-V: Multiple access: Principles of frequency multiple access system, FDMA channelization, AM-PM conversion with FDMA, principles of TDMA system, satellite effects on TDMA performance, Code division multiple access, synchronised, non-synchronised CDMA. (9)

UNIT-VI: Earth Station technology and satellite services: Earth Station design, tracking, equipment for earth stations, domestic satellite systems using small earth stations, VSAT, Global positioning system.

Text Books:

8SU4 / 8SL4 ELECTIVE-II
(3) ADVANCED MICROPROCESSORS
UNIT-I: Overview of Intel 8086 architecture: Bus timing diagrams, Interrupt structure, ISRs, Minimum and Maximum mode. (8)


UNIT-III: Introduction to 80286: Architecture, hardware features, operation in real mode and protected virtual address mode basic bus operation minimum system configuration, 80287 Numeric co-processor. (8)

UNIT-IV: Intel 80386: Architecture, real mode operation, protected mode operation, segmentation, virtual 8086 mode. (9)

UNIT-V: Intel 80386 conventional interfacing strategies, cache memory systems, 80486 family, internal architecture memory and I/O organization, interrupt, internal exceptions. (8)

UNIT-VI: Pentium processor: Salient features of 80586 (Pentium), system architecture, branch prediction, MMX, MMX data types, wraparound and saturation arithmetic, Basic architecture of Pentium –IV. (7)

TEXT BOOKS:
5. B.B. Brey: The Intel Microprocessor 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Proprocessor. (4/e)

8SU4 ELECTIVE-II
(4) WIRELESS COMMUNICATIONS
Unit-I: Introduction to Cellular Mobile System: evolution of cellular mobile systems (1st, 2nd, 3rd generation), A basic cellular system, cell shape, concept of frequency reuse, hand off strategies, power control operation of cellular systems. Example of cellular calls. (8)

Unit II: Cellular radio system design fundamentals: frequency assignments, channel assignment strategies, co-channel and
non-co-channel interference, cellular system capacity, performance criteria, trunking and grade of service, improving coverage and capacity in cellular system, multiple access schemes.

(9)

Unit III : Mobile Radio propagation & Antennas : Radio propagation mechanism, path loss modelling and signal coverage, multipath propagation, fading, doppler shift, fast and slow fading, control of fading in mobile systems, Antennas at cell site, mobile antenna, diversity.

(10)

Unit IV : Digital Cellular Systems : GSM : system architecture, radio subsystem, channel types, frame structure, signal processing in GSM, CDMA (IS 95) : frequency and channel specifications, forward & reverse CDMA channel.

(9)

Unit V : Cordless systems and WLL : Introduction to cordless systems, CT2 and DECT standards, DECT architecture, DECT frame format and radio link, DECT operation.

WLL : role of WLL, propagation considerations for WLL, LMDS and MMDS.

(9)

Unit VI : Wireless LAN : overview of wireless LAN, wireless LAN technologies ; infrared, spread-spectrum, narrow band microwave LAN, mobile data networks : CDPD, GPRS, WAP.

Bluetooth : overview, radio specification, base band specification, link manager specifications.

(9)

TEXT BOOKS:

REFERENCE BOOKS:

8 SU 5 PROJECT & SEMINAR

*****
SANT GADGE BABA AMRAVATI UNIVERSITY
$ REGULATION NO. 13 OF 2002

Examinations leading to the Degree of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.... Semester Pattern) Regulation, 2002.

Whereas it is expedient to frame the Regulation in respect of Examinations leading to the Degree of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.....Semester Pattern) for the purposes hereinafter appearing the Management Council is hereby pleased to make a following Regulation.

1. This regulation may be called “Examinations leading to the Degree of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.... Semester Pattern) Regulation, 2002.

2. This Regulation shall come into force w.e.f. the Academic session-
   i) 2000-01 for Ist & IInd Semester B.E.,
   ii) 2001-02 for IIIrd & IVth Semester B.E.,
   iii) 2002-03 for Vth & VIth Semester B.E., and
   iv) 2003-04 for VIIth & VIIIth Semester B.E.

3. The Schemes of Teachings and Examinations for Ist & IInd, IIIrd & IVth, Vth & VIth, and VIIth & VIIIth Semester in respect of Bachelor of Engineering (Electronics & Telecommunication Engineering) (Four Year Degree Course.... Semester Pattern) shall be as per Appendices-A, B, C, and D appended with this Regulation respectively.

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Sant Gadge Baba Amravati University (SGBAU) famously known as Amravati University is a public university which is situated in the Amravati district of Maharashtra. The university was established in the year 1983 on Maharashtra Day. The university campus is spread over 470.63 acres land with the lush-green campus, recognized by the University Grants Commission (UGC) re-accredited by NAAC with ‘A’ grade in 2016, owns the jurisdiction over five districts of Vidarbha i.e Amravati, Akola, Yavatmal, Buldana, Washim. Wikipedia Page. Click Here.

Sant Gadge Baba Amravati University Maharashtra admission 2020. Sant Gadge Baba Amravati University (SGBAU) was established in 1983. The university is located in Amravati, Maharashtra. It offers various UG, PG and M.Phil & Ph.D. courses in the field of Arts, Ayurveda, Commerce, Education, Engineering & Technology, Home Science, Law, Medicine, Science, and Social Science. The facility of research is provided availability in different kinds of colleges which are getting affiliation in colleges of SGBAU in the stream of Medicine, Pharmacy, Science, Microbiology.