V to VIII Semester B.E.   Prospectus No. **101720**
Electronics & Telecommunication

संत गाडगे बाबा अमरावती विद्यापीठ

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

Inpalnt 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 strickly 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 inplant training on their own risk and cost. An undertaking in this regards signed by student and parents shall be submitted before proceding for training to the concerned Head of Department/ Head of Institution.

   g) the students shall complete inplant training under the supervision of concerned person in the industry,

   h) Institutes shall help students to organise inplant training by way of correspondance,

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 biastable, monostable and astable multivibrators, Time base generators & Sweep Generators. Number systems, Gray codes, Arithamtic operations, 2's compliments, floating point arithmatic and its representation.

Unit III   :   Switching characterisitcs 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 :   Mininum 8 practicals based on above syllabus, preferably uniformly distributed.

BOOKS RECOMMENDED :

1)   Jacob Millman & Herbert Taub : "Pulse Digital & Switching waveforms", McGraw Hill International Book Company, 1985.

2)   Taub H. and Schillings D.L., London, : "Digital Integrated Electronics", McGraw Hill Company, 1984.

3)   R.P.Jain : "Modern Digital Electronics", Tata McGraw Hill, New Delhi 1998.

4)   Malvino A.P. and Leach D.P. : "Digital Principles and Applications", TMH Publishing Co., New Delhi (Third Edition), 1981.

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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5 SUI 2   POWER ELECTRONICS

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 ckts., 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, out put 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 ckts. 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.

6) G.K.Dubey, S.R.Doradia, A.Joshi, R.M.K. Sinha - Thyristorised Power Controller.

7) M.D.Singh & K.B.Khanchandani - Power Electronics, Tata McGraw Hill.

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5 SUL 3   INDUSTRIAL MANAGEMENT AND QUALITY CONTROL

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, inventroy control, introduction to production, planning and control.

Unit III : Personnel Management :

Meaning and functions of personnel management, recruitment, selection, promotion, wages and salary administation, 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, 7QC (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 :

1) Koontz H., O'Donnel C. and Whierich : Principles of Management, Tata McGraw Hill Puslishing Co. Ltd., New Delhi.
2) Khanna O.P. : Industrial Engineering and Management.
3) Mody Suresh M. : Total Quality Management, D.L.Shah and Trust, Mumbai
4) Sherlekar S.A. : Business, Organisation and Management, Himalaya Pub. House Ltd., Mumbai.
5) Gupta P.B. & Sharma P.B. : Industrial Management & Managerial Economics, Ratnasagar Pvt. Ltd., New Delhi.
6) Khanka : Entrepreneurial Development, S.Chand & Co., New Delhi.
7) Mahajan S.M. : Statistical Quality Control.

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5 SUL 4   COMMUNICATION ENGINEERING-I

SECTION-A

Unit I : AM Transmitters : Modulation, need of modulation, AM Modulation, Frequency spectrum, Principles of DSB-FC, DSB-SC, SSB-SC modulation and their comparison, Details of DSB-FC Transmitter, Generation of DSB-SC by using balanced modulators (FET & Diodes), DSB-SC Transmitter.. Generation of SSB-SC by phase-shift method.

Unit II : AM 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, fidility communication receiver.

Unit III : FM Transmitters : FM Modulation, Frequency Spectrum, Circuits & Analysis for direct FM generation using FET and varactor diode. Circuit & analysis of Indirect FM generation, Narrow Band and Wide Band FM, their comparision, De-emphasis and pre- emphasis. FM Transmitter & stereo FM Transmitter.

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 :

1) Kennedy G. : Electronics Communication System, Tata McGraw Hill Co.,New Delhi (Third Edition), 1985.
2) Young P.H. : Electronics Communication Techniques, Coloumbus, A Bell and Howell Co. (First Edition)
3) Martin James : Telecommunication and the Computer, Prentice Hall Inc. New Jersey (Third Edition), 1972.
4) Roddey D., Coolen S. : Electronics Communication, Prentice Hall India Pvt. Ltd. (Third Edition), 1983.
5) Beck, Robert and J. Schoen : Electronics Communication, Modulation

and Transmission, A Bell and Howell Co., Indiana.

6) Murphy R.J. : Telecommunication Network, Hiward W., Sams & Co., 1987.

7) Dhake : TV Engineering.

8) Agrawal D.G. : Satellite Communications, Khanna Publication.

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5 SUL I 5   CONTROL SYSTEM ENGINEEING

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)

3) I.J. Nagrath & M.Gopal : Control System Engg. (Wiley Eastern)

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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 hierachies, 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 Architrcture.

Unit VI : ADVANCED PROCESSORS :

Architecture, organisation and features of Pentium, Power PC-620 processors.

BOOKS RECOMMENDED :

1) Hayes J.P. : Computer Architecture and Organisation, McGraw Hill, Auckland.

2) Mano Morris : Computer System Architecture, Prentice Hall of India New Delhi.

3) Tanenbaum A.S. : Structure Computer Organisation, Prentice Hall of India, New Delhi.

4) Wiliam Stallings : Computer Organisation and Architecture, Addison Wesley Longman (Singapore) Ltd.

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6 SUL 2   INTRODUCTION TO MICROPROCESSORS

SECTION-A

Unit I : 8085 : Architecture, Register Structure, Addressing modes, Instruction set of 8085, Timing diagrams.

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 timming.

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 :

1) Gibson G.A., Liu Y.C. : Microcomputer system the 8086/8088 family, Prentice Hall India Pvt. Ltd., New Delhi (Second edition), 1996.

2) Hall D.V. : Microprocessor and Interfacing Programming and Hardware, McGraw Hill Co., New York, 1986.

3) Gaonkar R.S. : Microprocessor Architecture Programming and Applications with the 8085, Penram International Pub. (Third Edition), 1997.

4) Mathur A.P. : Introduction to Microprocessor, Tata McGraw Hill Pub., New Delhi (Second Edition), 1986.

5) Gilmore : Microprocessors Principles and Applications, Tata McGraw Hill Pub. Co. (Second Edition)

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6 SU 3   COMMUNICATION ENGINEERING-II

SECTION-A

Unit I : ANALYSIS

Classification of signals, Fourier Series, Expontential Fourier Series, Fourier Transform, Properties of Fourier Transform, Delta Function, Fourier Transform of Periodic functions, Power Spectral Density, Energy Spectral Density, Correlation, Auto-correlation, Cross-correlation.

Unit II : PROBABILITY AND RANDOM SIGNAL THEORY

Probability, Random variable, PDF Random processes, stationarity, Mean, Correlation and Covariance Functions, Ergodicity, Spectral Density, Gaussian Process, White Gaussian Noise.

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, Comparasion 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 :

1) John Wiley, Simon Haykin : Communication System, Eastern Ltd., New York, (Third Edition), 1994.

2) Taub and Schilling D.L. : Principles of Communication Systems, Mc-Hill Co, Tokeyo, 1994 (II Ed.)

3) Keiser Geord : Optical Fiber Communication, McGraw Hill Int. Book Co., New York, (Second Edition), 1991.

4) R.P.Singh, S.D.Sapre : Communication Systems Analog and Digital, Tata McGraw Hill Co.

5) Lathi B.P. : Communication System, Wiley Eastern Ltd., 1983.

6) S.S.Das : Electronic Telephony.

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6 SUL 4 NUMERICAL METHODS AND OPTIMIZATION TECHNIQUES

SECTION-A

Unit I : Error Analysis, Absoute, 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 :

Gauss elimination method, I11 conditioned equations, Refinement of solution obtained by Gaussian elimination, matrix inversion method, L-U factorisation method, Gauss Seidel iterative method.

B) Curve fitting : Least Square Method.

Unit III : Differentation : Integration and Differential equations. Finite differences, Newtons forward and backword interpolation formula. Numerical differentiation : Maximum and minimum values. Numerical integration : General quadrature formula, rectangular, trapezoidal, Simpsons one third and three eight rules, Romberse method, Double integration.

Ordinary differential equations : Initial value problem, Euler's method, Runge Kutta methods, Predictor Corrector method, Higher order differential equations.

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 intial 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, transporatation problems.

Non linear, programming - random search method, pattern search method, Steppest 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 :-

1) Computer Oriented Numerical Methods : V.Rajaraman, Second Edition, Prentice Hall of India Pvt. Ltd., New Delhi.

2) Introduction to Methods of Numerical Analysis : S.S.Shastry, Second Edition, Prentice Hall of India Pvt. Ltd., New Delhi.

3) Numerical Methods for Mathematics Science and Engineering : John H. Mathews, Prentice Hall (India) Publication.

4) Introduction to Operation Research : Billy, E.Gillett, 15th edition, Tata McGraw Hill Pub. Co. Ltd., New Delhi.

5) Optimization Theory and Applications : S.S.Rao, Second Edition, Wiley Eastern Limited, New Delhi.

6 SULI 5   LINEAR INTEGRATED CIRCUITS

SECTION-A

Unit I   :   Operational Amplifier

Differential amplifier : gain expressions using H parameters, transfer-charactersitics, 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 off set nulling and their improtance.

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 convertor.

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 :-

1) Gayakwad R.A. : OP-Amps and Linear Integrated Circuits, Prentice Hall of India Pvt. Ltd., New Delhi (Second Edition), 1980.

2) Milliman J. and Grabel A. : Microelectronics, McGraw Hill Book Co., New Delhi, 1985.

3) Tobey J.E. and Grame J.E. : Operational Amplifier Design and Applications, International Student Edition, 1983.

4) Linear Application Handbook : National Semiconductors.

5) Application Node on IC : BEL India.

6) Herb Taub and Donald Schilling : Digital Integrated Circuits, McGraw Hill Pub.

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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 effectivity and subject content.

Non-verbal communication, types of graphics and pictoral 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 :

1) Krishna Mohan, Meera Banerjee : Developing Communication Skills, MacMillan India Limited.
2) Chrissie Wright (Editor) : Handbook of Practical Communication Skills, Jaico Publishing House.
3) Curriculum Development Centre, TTTI WR, Bhopal : A Course in Technical English, Somaiya Publication Pvt. Ltd.
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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APPENDIX-C

L : Theory Lecture	FOUR YEAR B.E. DEGREE COURSE
T : Tutorial	SEMESTER PATTERN
P : Practical	SEMESTER : **FIFTH**
D : Drawing / Design	BRANCH : ELECTRONICS AND TELECOMMUNICATION

ABBRIVATIONS :-
S - SEMESTER PATTERN
U - ELECTRONICS & TELE.
L - INDUSTRIAL ELECTRONICS
I - INSTRUMENTATION
E - ELECTRICAL

Sr. No.	Sub. Code No.	SUBJECT	Teaching Scheme				Examination Scheme									
			L	T	P/D	Total Hours/ Week	Theory						Practical			
							Duration of Papers	Maximum Marks		Total	Min. Pass Marks		Maximum Marks		Total Marks	Mininum Passing Marks
								Theory (Hrs)	College Papers	Assessment			External	Internal		
1.	5SUL1	Electronic Devices and Circuits-II	4	1	2	7	3	80	20	100	40		25	25	50	25
2.	5SUI2	Power Electronics	4	1	2	7	3	80	20	100	40		25	25	50	25
3.	5SUL3	Industrial Management & Quality Control	4	-	-	4	3	80	20	100	40		--	--	--	--
4.	5SUL4	Communication Engineering-I	4	1	2	7	3	80	20	100	40		25	25	50	25
5.	5SULI5	Control System Engineering	4	1	-	5	3	80	20	100	40		--	--	--	--
		TOTAL	20	4	6	30				500					150	

GRAND TOTAL : 650

SEMESTER : **SIXTH**
BRANCH : ELECTRONICS AND TELECOMMUNICATION

Sr. No.	Sub. Code No.	SUBJECT	Teaching Scheme				Examination Scheme									
			L	T	P/D	Total Hours/ Week	Theory						Practical			
							Duration of Papers	Maximum Marks		Total	Min. Pass Marks		Max. Marks		Total Marks	Mininum Passing Marks
								Theory (Hrs)	College Papers	Assessment			External	Internal		
1.	6SUL1	Computer Organisation	4	-	-	4	3	80	20	100	40		—	—	—	—
2.	6SUL2	Introduction to Microprocessors	4	1	2	7	3	80	20	100	40		25	25	50	25
3.	6SU3	Communication Engineering-II	4	1	2	7	3	80	20	100	40		25	25	50	25
4.	6SUL4	Numerical Methods & Optimization Techniques	4	1	-	5	3	80	20	100	40		—	—	—	—
5.	6SULI5	Linear Integrated Circuits	4	1	2	7	3	80	20	100	40		25	25	50	25
6.	6SULI6	Communication Skills	2	1	-	3	2	40	10	50	20		15	10	25	12
		TOTAL	22	5	6	33				550					175	

GRAND TOTAL : 725

APPENDIX-D

L : Theory Lecture	FOUR YEAR B.E. DEGREE COURSE	ABBRIVATIONS :-
T : Tutorial	SEMESTER PATTERN	S - SEMESTER PATTERN
P : Practical	SEMESTER : SEVENTH	U - ELECTRONICS & TELE.
D : Drawing / Design	BRANCH : ELECTRONICS AND TELECOMMUNICATION	L - INDUSTRIAL ELECTRONICS

Sr. No.	Sub. Code No.	SUBJECT	L	T	P/D	Total Hours/ Week	Duration of Papers (Hrs)	Theory Maximum Marks	College Papers	Total Assessment	Min. Pass Marks	External	Internal	Total Marks	Mininum Passing Marks
1.	7SU1	Digital Communication	4	-	-	4	3	80	20	100	40	--	--	--	--
2.	7SUL2	Microprocessor Peripheral and Microcontroller	4	-	2	6	3	80	20	100	40	25	25	50	25
3.	7SU3	Digital Signal Processing	5	-	2	7	3	80	20	100	40	25	25	50	25
4.	7SUL4	Digital ICs & Design	4	1	2	7	3	80	20	100	40	25	25	50	25
5.	7SU5	Elective-I	4	-	-	4	3	80	20	100	40	--	--	--	--
6.	8SU5	Project & Seminar	-	-	2	2	-	--	--	---	--	--	--	--	--
		TOTAL	21	1	8	30				500				150	

GRAND TOTAL : 650

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

SEMESTER : EIGHTH
BRANCH : ELECTRONICS AND TELECOMMUNICATION

Sr. No.	Sub. Code No.	SUBJECT	L	T	P/D	Total Hours/ Week	Duration of Papers (Hrs)	Theory Maximum Marks	College Papers	Total Assessment	Min. Pass Marks	External	Internal	Total Marks	Mininum Passing Marks
1.	8SU 1	UHF & Microwave	5	-	2	7	3	80	20	100	40	25	25	50	25
2.	8SU2	Electronic Circuit Design	4	1	2	7	3	80	20	100	40	25	25	50	25
3.	8SU3	Communication Network	5	-	-	5	3	80	20	100	40	—	—	—	—
4.	8SU4	Elective-II	5	-	-	5	3	80	20	100	40	—	—	—	—
5.	8SU5	*Project & Seminar	-	-	6	6	-	--	--	---	--	75	75	150*	75
		TOTAL	19	1	10	30				400				250	

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:

1. Shanmugam K.S. :"Digital & Analog Communication Systems", John Wiley & Sons, New York, 1996.
2. Lathi B. P. :"Modern Digital and Communication Systems", Holt Rinchart and Winston Inc., New York, 1993.
3. Simon Haykin : "Digital Communication" , John Wiley and Sons, Pvt. Ltd., Singapore.

REFERENCE BOOKS :

1. Proakis J. K. :"Digital Communication", Mc-Graw Hill Book Co., London (Second Edition)
2. Taub, Herbert, Schilling D.L : "Principles of Communication Systems", Mc-Graw Hill International Book Co., Tokiyo.
3. Wcy Lee : "Mobile Cellular Telecommunications Systems", Mc-Graw Hill International Editions, 1990
4. Glover and Grant : "Digital Communication", Prentice Hall Publication .

7SUL2 **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:

1. Hall D.V. and Douglas V : "Microprocessor and Interfacing Programming and Hardware", Tata Mc-Graw Hill Book Co., New York (2/e)
2. Gaonkar R.S. :" Microprocessor Architecture Programming and applications with 8085/8080A", Penram International Publications, India.
3. K.J.Ayala : "The 8051 Microcontroller", Penram Int. Pubs., 1996

REFERENCE BOOKS:

1. National Semiconductor : Data Acquisition Linear Devices Data Book.
2. Embeded 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)
6. A. K. Ray and K. M. Burchandi : Advanced Microprocessor and Peripherals, Architecture Programming and Interfacing, Tata McGraw Hill Publishing Co. Ltd., New Delhi (TMH)

7SU3   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-IV : Filter categories, Direct form I, Direct form II, Cascade and parallel structure for IIR and FIR Filter, Frequency sampling structures for F.I.R. filter, Steps in Filter Design, Design by Pole Zero Placements, FIR filter design by Windowing method, Rectangular, Triangular and Blackman window. (8)

UNIT-V : Analog filter types, Butter worth, Elliptic filter, Specification and formulae to decide to filter order, Methods to convert analog filter into IIR digital, Mapping of differential, Impulse invariant, Bilinear, Matched Z transformation. (8)

UNIT-VI : Multi rate DSP, Introductory concept of multi rate signal processing, Design of Practical sampler, Rate converters, Decimators and Interpolator, Filter Bank application and examples. (8)

Practicals: Eight experiments should be based on above syllabus.

TEXT BOOKS:

1. Oppenhavm & Scheffer : Discrete time Processing (PHI)
2. Proakis & Monolakis D.G. : Digital Signal Processing (PHI)
3. Mitra S.K. : Digital Signal Processing (PHI)

REFERENCE BOOKS:

1. Roman Kuo : Digital Signal Processing (MCW)
2. Ifeacher E.C., Jervis B. W. : Digital Signal Processing (Addison Wesely)
3. P. P. Vaidyanathan : DSP and Multirate Systems (PHI)
4. Rabiner and Chrocherie : Multirate DSP (PHI)

7SUL4   DIGITAL IC'S & DESIGN

UNIT-I : Combinational Logic Design:

Function of binary variables, Boolean Algebric theorems, standard form of logical functions, K-map up to five variables, Quine Mcclusky method, Don't care conditions and it's effects, Synthesis using AND - OR gates. (8)

UNIT-II : Combinational logic design using 74/54 series MSI chip series concerning to multiplexers, demultiplexers, decoders, encoders, comparators, code converters, priority encoders parity generator/ checker & BCD-Seven segment decoder. (09)

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 :

1. Charles H. Roth : "Fundamental of Logic Design" , 4th ed. Jaico Publication.
2. Lee S.C. : "Digital Circuit and Logic Design", Prentice Hall of India Pvt. Ltd., New Delhi
3. Jain R.P. : "Modern Digital Electronics Circuits and Systems", Macmillan Press, London

REFERENCE BOOKS:

1. Fleatcher : An Engineering approach to Digital System Design ", PHI
2. Morris N.M. : "Digital Electronics Circuits & Systems", Mac millan Press, London
3. Digital IC reference data manual
4. Texas Instru. Incorporated : Designing with TTL IC's.
5. Parag K. Lala : Fault Tolerant and Fault Testable Hardware Design, B.S. Publication, Hydrabad

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.

Multilayer Network : Architecture of feed forward network, Learning rule, generalized delta rule, learning function. Back propagation algorithm.   (9)

UNIT-III : Unsupervised Learning:

Introduction, Counter propagation networks, Kohonen's self organizing maps.

Hopfield networks.   (8)

UNIT-IV : Introduction : Uncertainity 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 :

1. J.M. Zurada : "Introduction to Artificial Neural Systems", Jaico Publishing House.
2. Meherotra Kishan, Mohan C.K., Ranka Sanjay : "Elements of artificial neural networks", Penram Int. Pub., Mumbai
3. Timothy Koss : "Fuzzy Logic with Engineering Applications", McGraw Hill International Edition.

REFERENCE BOOKS

1. N. K. Bose and P. Liang : "Neural Network Fundamental with Graphs, Algorithms and Applications", Tata McGraw Hill Edition.

2. G.J. Klir and T.A. Folger : Fuzzy sets, Uncertainity and Information", PHI Publication

3. Kosko Bart : "Neural Networks & Fuzzy systems", Prentice Hall of India Pvt.Ltd., New Delhi

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 ELECTRONIC 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 :

1. Senior J.M. :"Optical Fiber Communication and Application", Prentice Hall of India Pvt. Ltd., New Delhi.

2. G.Keiser : "Optical Fiber Communication", Mc-Graw Hill International Book Co., New York.

REFERENCE BOOKS:

1. Gowar : "Optical Communication System", Prentice Hall

2. J. H. Franz and V. K.Jain : "Optical Communications, Components and System", Narosa Publication

3. Ghatak & Thyagarajan : "Optical Electronics", Cambridge foundation.

4. Djafar K. Mynbaev, Lowell I. Scheiner : "Fiber Optic Communication Technology", LPE, Pearson Eduction, 2001.

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 Nearnst 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 electrotherpy equipments. Cardiac

pacemaker machine, Cardiac Defibrillators, Nerve and Muscle stimulators. Diathermy : short wave, microwave, ultrasonic. (8)

UNIT-V   :   PATIENT CARE AND MONITORING AND SAFETY

System concepts, Bedside patient monitors, central monitors, Average reading heart monitor, Intensive care monitoring, Ambulatory monitoring. Biotelemetry : Single channel and Multichannel biotelementry, telephonic data transmission.

PATIENT SAFETY : Electric shock hazards, leakage current. Types of Leakage current, measurement of leakage current, methods of reducing leakage current, precautions to minimize electric shock hazards. Telemedicine.   (9)

UNIT-VI   :   COMPUTERS IN BIOMEDICAL ENGINEERING

Computerized Axial Tomography (CAT)

Computerized Aided ECG analysis

Computerized patient monitoring system.

Computerized Catheterization.   (8)

TEXT BOOKS:

1.   Khandpur R.S. : "Handbook of Biomedical Instrumentation", Tata Mc-Graw Hill, New Delhi.
2.   Cromwell L. & Weibell F.J. : "Biomedical Instrumentation and Measurement", Prentice Hall of India.

REFERENCE BOOKS:

1.   Dr. Lele R.D. : "Computer Applications of Medicine", Tata Mc-Graw Hill, New Delhi.
2.   Webstar J.G. : "Medical Instrumentation", IIIed., John Wiley & Sons.
3.   Carr and Brown : Biomedical Equipment Technology.

7SU5   ELECTIVE-I

(4) PROCESS CONTROL & INSTRUMENTATION

UNIT I   :   Introduction to Process Control: Process control principles, Introduction to Discrete state control systems, Process control block diagram, Process control drawings, Sensor time response.

Dynamic elements in control loop, single capacity and multicapacity process, interacting and noninteracting elements, Concepts of Gains and its types   (8)

UNIT II   :   Basic Control Actions: On-off control, P, I, PI, PD, & PID controllers and their implementation using electronic components. Optimal controller settings-various methods.

Complex Control Actions : Feed back control, Ratio control systems, Split range control, Cascade control, Selective control, Feedforward control, Adaptive control.   (10)

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. (8)

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.   (9)

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.   (8)

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.   (7)

TEXT BOOKS :

1.   Johnson C. : "Process Control Instrumentation Technology", (7th Ed.) Prentice Hall of India, New Delhi.
2.   Harroit P. :"Process Control", TMH, New Delhi.
3.   Shinskey F.G. : "Process Control", Mc-Graw Hill Book Co., New York.

REFERENCE BOOKS :

1.   Patranabis D.: "Principle of Process Control", Tata Mc-Graw Hill Pub. Co., New Delhi (IInd Edition).
2.   Eckman : "Automatic Process Control", Wiley Eastern Pvt. Ltd., New Delhi.
3.   Krishna Kant : "Computer Based Industrial Control" , PHI
4.   Liptak B.G. : "Process Control Instrument Engineers Handbook", Chitton Book Co., Radnor.

7SU5   **ELECTIVE-I**

(5) ROBOTICS & AUTOMATION

UNIT-I   :   Definition of a Robot, A brief introduction to Robot Technology, Sensory perception, Intelligence, End Effectors, Sensory feedback, Robot Vision / Computer Vision and its fundamental components, Tactile Sensing, Range finding and real world navigation Speech synthesis and recognition.

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.   (12)

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, sementic Nets and their characteristics, Frames, A Brief about Expert system comparison of various methods of knowledge representation.   (10)

UNIT-III :   Elements of speech, Time Domain Analysis / Synthesis of speech and waveform digitization, frequency Domain Analysis / Synthesis of speech phoneme Speech Synthesis, various type of speech recognition Systems and their basics ideas, Isolated word Recognition, Connected Speech understanding.   (12)

UNIT-IV :   Elements of vision, Image Transformation, Image Analysis, Image Understanding of Machine perception, Industrial Vision System.   (9)

UNIT-V   :   Triangularation Method, Time of Flight (TOF), Ranging Method, Robot Position and Proximity Sensing, Tactile-Sensing System, Sensing Joint Forces and their importance in Robot programming, sensing tough and slip.   (9)

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.   (12)

TEXT BOOKS :-

1.   Staugard A.C. : "Robotic and AI", Prentice Hall, Engle Wood Cliff N.J. 1987.
2.   Lee C.S.G., Fu K. S., Gonzalez R.C. : "Robotic-Control, Sensing and Intelligence", Mc-Graw Hill, Singapore, 1987.

REFERENCE BOOKS :-

1.   Klafferetal : "Robotics"
2.   Parent M. and Laugreau C. : "Robot Technology (Vol.4 : Logic and Programming", Kogan Page, London, 1985.
3.   Aleksander I. ,Farreny H. and Ghallab M. : "Robot Technology " (Vol-1).
4.   Decision and Intelligence "Kogan Page", 1986.

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EIGHTH SEMESTER

8SU1   **UHF & MICROWAVES**

UNIT-I   :   MICROWAVE TUBES :

Two cavity and reflex klystron, magnetron, TWT, noise in microwave tubes.   (8)

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. (9)

UNIT-III :   TRANSMISSION OF MICROWAVES :

Field analysis of transmission line, Rectangular wave guide , (TE and TM modes), Striplines- Microstrip lines characteristics, impedence losses in microstrip lines, types of strip lines.   (9)

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.   (9)

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 :

1. Liao, Samual Y. : "Microwave devices & circuits", Tata Mc_Graw Hill Co.Ltd., New Delhi

2. Collin, Robert E. : "Foundations for Microwave Engineering", Mc-Graw Hill, New York.

REFERENCE BOOKS :-

1. Kennedy G. :"Electronics Communication Systems", Tata Mc-Graw Hill Book Co., New Delhi..

2. K.C. Gupta : "Microwave Engg.", (WEL)

3. Reich, Scolnik, Ordung, Krangs : "Microwave Principles", PHI

4. M. Kulkarni : "Microwave and Radar Engineering", Umesh Publication.

5. M.L. Sisodiya and G.S. Raghuwanshi : "Microwave Circuits and Passive devices", (WEL)

6. Mathew M. Radmanesh : RF and Microwave Electronics – Illustrated.

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-III : Design of instrumentation amplifier, Temperature controller / indicator using thermocouple, resistance thermal detector & thermister. Design of IC 555 based circuits. (8)

UNIT-IV : Introduction to CMOS / VLSI Circuits, MOS transistor swtich, 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, confiugations, 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, asychronous 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:

1. Goyal-Khetan : "A Monogram on Electronic Circuit Design.

2. Paul Horowitz - W.Hill : "The art of Electronics", (Cambridge Publication).

3. National Semiconductor Data Book.

4. Douglas L. Perry : VHDL (3rd Ed.) , McGraw Hill.

5. Neil Weste - K. Eshraghian : Principle of CMOS / VLSI Design (Person Education).

6. Carver Mead, Lynn Conway : Introduction to VLSI Systems.

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. Amdrene S. Tanenbaum : "Computer Networks", PHI
2. W. Stallings : "Data and Computer Communications", (Maxwell Mechmillan)

REFERENCE BOOKS :

1. D Bertsekas and R.G. Gallager: "Data Networks", (2 e) , Pearson Ed., (PHI)
2. Behrouz A Forouzan : "Data Communication and Networking" , (TMH)
3. Uyless Black : "Computer Networks", (PHI)
4. Doglus E. Comer : "Computer Networks and Internets", (Pearson Education)

8SU4 /8SL4   ELECTIVE-II

(1) DIGITAL IMAGE PROCESSING

UNIT-I : Introduction to digital image processing, Digital Image Fundamental, Elements of Visual Perception, Simple Image Model, Sampling and Quantization, Basic Relationships between Pixel Imaging Geometry, Gray scale image representation. (8)

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 :

1) Gonzaler and Woods: "Digital Image Processing", Addison / Wesley.

2) Milan Sonka, Vaclav Hlavac, Roger Boyle : Image processing Analysis and Machine Vision" , Book / Cole 2nd Edition.

REFERENCE BOOKS:

1) A.K.Jain : "Digital Image Processing", PHI

2) William K. Pratt : "Digital Image Processing", 3rd ed. , John Wiley and Sons Publi.

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 :

1. Gagliardi Robert M. : "Satellite Communiction", CBS publications & Distributors, New Delhi.
2. Pratt Timothy and Bostian W. Charles: "Satellite Communication", Willey International Publication, New York.
3. Roddy D. : "Satellite Communications", Mc-Graw Hill Pub. Co. New York.

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-II : Multiprocessor System :

Numeric processor 8087 : Architecture and interfacing.

I/O processor 8089 : Architecture and interfacing.

Bus arbitration and control, tightly coupled and loosely coupled systems . (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 :

1. A.K. Ray and K.M. Bhurchandi : "Advanced Microprocessors and Peripherals", TMGH Publ.
2. S. K. Venkataram : "Advanced Microprocessor and Microcontrollers", Laxmi Publ.
3. Walter A. Triebel : " The 80386, 80486 and Pentium Processor – Hardware, software and interfacing", PHI Publ.
4. K. R. Venugopal and Rajkumar : "Microprocessor X86 programming", BPB Publ.
5. B.B.Brey : The Intel Microprocessor 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium and Pentium Proprocessor. (4/e)

8 SU 4   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-chanel 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 :
1) William CY Lee : "Mobile Cellular Telecommunications"(second edition) McGraw Hill Inc. (1995)
2) Theodore S.Rappaport : "Wireless Communications : Principles & Practice", second edition, Pearson Education (2002)

REFERENCE BOOKS :
1) William Stallings : "Wireless Communications and Networks" Pearson Education Asia Publication (2002)
2) K.Pahlavan and P.Krishnamurthy : "Principles of Wireless Networks", Pearson Education Asia Publication (2002)
3) Jochen Schiller : "Mobile Communications", Pearson Education Asia Publication (2002)
4) Andy Dornam : "The Essential Guide to Wireless Communication Appllications", Pearson Education Asia Publication.

8 SU 5   PROJECT & SEMINAR

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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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$ as amended vide Regution No.32 of 2003 & 16 of 2007.