J. S. University, Shikohabad

B.Tech

5th Semester & 6th Semester

(Electronics & Communication Engineering)

Scheme

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Syllabus

[Effective from the session 2015-16]

STUDY AND EVALUATION SCHEME FOR

B.Tech (Electronics & Comm. Engineering).

SEMESTER - Fifth

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional	End Exam	Total	Duration
THEORY SUBJECT										
1	BTEC-51	Integrated Circuits	4	1	-	-	50	100	150	3
2	BTEC-52	Principles of Communication	4	1	-	-	50	100	150	3
3	BTEC-53	Microprocessors	4	1	-	-	50	100	150	3
4	BTEC-54	Control System–I	4	1	-	-	50	100	150	3
5	BTEC-55	Antenna and Wave Propagation	4	1	-	-	25	50	75	2
6	BTMB-51	Engineering Economics	4	1	-	-	25	50	75	2
PRACTICA/DRAWING SUBJECTS										
7	BTEC-51P	Integrated Circuits Lab	-	-	2	-	20	30	50	3
8	BTEC-54P	Control System Lab	-	-	2	-	20	30	50	3
9	BTEC-52P	Communication Lab–1	-	-	2	-	20	30	50	3
10	BTEC-53P	Microprocessors Lab	-	-	2	-	20	30	50	3
11	BTGD-50	Games//Social and Cultural Activities + Discipline (25 + 25)							50	
								Grand Total	1000	

NOTE:- (1) Each period will be 50 minutes duration.
(2) Each session will be of 16 weeks.
(3) Effective teaching will be at least 14 weeks.
(4) Remaining periods will be utilized for revision etc.

STUDY AND EVALUATION SCHEME FOR

B.Tech (Electronics & Comm. Engineering).

SEMESTER - Sixth

S.No.	Subject Code	Name of Subject	Periods Per Week				Evaluation Scheme			
			L	T	P	D	Sessional	End Exam	Total	Duration
THEORY SUBJECT										
1	BTEC-61	Microwave Engineering	4	1	-	-	50	100	150	3
2	BTEC-62	Digital Communication	4	1	-	-	50	100	150	3
3	BTEC-63	Integrated Circuit Technology	4	1	-	-	50	100	150	3
4	BTEC-64	Digital Signal Processing	4	1	-	-	50	100	150	3
5	BTEC-65	Industrial Electronics	4	1	-	-	25	50	75	2
6	BTMB-61	Industrial Management	4	1	-	-	25	50	75	2
PRACTICA/DRAWING SUBJECTS										
8	BTEC-61P	Antenna and Microwave Lab	-	-	2	-	20	30	50	3
9	BTEC-62P	Communication Lab–II	-	-	2	-	20	30	50	3
10	BTEC-63P	CAD of Electronics Lab	-	-	2	-	20	30	50	3
11	BTEC-64P	Seminar	-	-	2	-	50	-	50	3
12	BTGD-60	Games//Social and Cultural Activities + Discipline (25 + 25)							50	
								Grand Total	1000	

NOTE:- (1) Each period will be 50 minutes duration.

(2) Each session will be of 16 weeks.

(3) Effective teaching will be at least 14 weeks.

(4) Remaining periods will be utilized for revision etc.

[BTEC-51] Integrated Circuits

UNIT 1

Analog Integrated circuit Design: an overview: Current Mirrors using BJT and MOSFETs, Simple current Mirror, Base current compensated current Mirror, Wilson and Improved Wilson Current Mirrors, Wilder Current source and Cascade current Mirror

The741ICOp-Amp: Bias circuit, short circuit protection circuitry, the input stage, the second stage, the output stage, and device parameters; DC Analysis of 741: Small Signal Analysis of input stage, the second stage, the output stage; Gain, Frequency Response of 741; a Simplified Model, Slew Rate, Relationship Between ft and SR

UNIT 2

Linear Applications of IC op-amps: An Overview of Op-Amp (ideal and non-ideal) based Circuits V-I and I-V converters, generalized Impedance converter, simulation of inductors

Filters: First and second order LP, HP, BP BS and All pass active filters, KHN.

UNIT 3

Digital Integrated Circuit Design-An Overview: CMOS Logic Gate Circuits**:** Basic Structure CMOS realization of Inverters, AND, OR, NAND and NOR Gates

Latches and Flip flops: The Latch, The SR Flip-flop, CMOS Implementation of SR Flip flops, A Simpler CMOS Implementation of the Clocked SR Flip-flop, D Flip-flop Circuits.

UNIT 4

Non-Linear applications of IC Op-amps: Log–Anti Log Amplifiers, Precision Rectifiers, Peak Detectors, Simple and Hold Circuits, Analog Multipliers and their applications. Op- amp as a comparator, Zero crossing detector, Schmitt Trigger, Astable multivibrator, Mono stable multivibrator, Generation of Triangular Waveforms

UNIT 5

D/A and A/D converters

Integrated Circuit Timer: The 555 Circuit, Implementing a Monostable Multivibrator Using the 555 IC, Astable Multi vibrator Using the 555 IC.

Phase locked loops (PLL): Ex-OR Gates and multipliers as phase detectors**,** Block Diagram of IC PLL, Working of PLL and Applications of PLL.

Text Books:

1. Sedra and Smith,"MicroelectronicCircuits",6th Edition, Oxford University Press.
2. MichaelJacob,"ApplicationsandDesignwithAnalogIntegratedCircuits",PHI,2nd Edition.

Reference Books:

1. Jacob Millman and Arvin Grabel, "Microelectronics", 2nd Edition, Tata Mc Graw Hill.
2. Behzad Razavi, "Fundamentals of Microelectronics",2nd Edition, Wiley.
3. Mark N. Horenstein, "Microelectronic Circuits and Devices", PHI.
4. Paul R. Gray, Paul J. Hurst, Stephen H. Lewis and Robert G. Meyer, "Analysis and Design of Analog Integrated Circuits", Wiley.

[BTEC-52] Principles of Communication

Unit 1

Introduction: Overview of Communication system, Communication channels, Need for modulation, Base band and Pass band signals, Amplitude Modulation: Double side band with Carrier (DSB- C), Double side band without Carrier, Single Side Band Modulation, DSB-SC, DSB-C, SSB Modulators and Demodulators, Vestigial Side Band (VSB), Quadrature Amplitude Modulator, Radio Transmitter and Receiver.

Unit 2

Angle Modulation, Tone Modulated FM Signal, Arbitrary Modulated FM Signal, FM Modulators and Demodulators, Approximately Compatible SSB Systems, Stereophonic FM Broadcasting, Examples Based on MatLab.

Unit 3

Pulse Modulation, Digital Transmission of Analog Signals: Sampling Theorem and its applications, Pulse Amplitude Modulation (PAM), Pulse Width Modulation, Pulse Position Modulation. Their generation and Demodulation, Digital Representation of Analog Signals, Pulse Code Modulation (PCM), PCM System, Issues in digital transmission: Frequency Division Multiplexing, Time Division Multiplexing, Line Coding and their Power Spectral density, T1 Digital System,

Unit 4

Differential Pulse Code Modulation, Delta Modulation. Adaptive Delta Modulation, Voice Coders, Sources of Noises, Frequency domain representation of Noise, Super Position of Noises, Linear filtering of Noises, Mathematical Representation of Noise.

Unit 5

Noise in Amplitude Modulation: Analysis, Signal to Noise Ratio, Figure of Merit. Noise in Frequency Modulation: Pre-emphasis, De Emphasis and SNR Improvement, Phase Locked Loops Analog and Digital.

Text Book:

1. HerbertTaubandDonaldL.Schilling,"PrinciplesofCommunicationSystems",TataMcGrawHill.

Reference Books:

1. B.P.Lathi,"ModernDigitalandAnalogcommunicationSystems",3rd Edition, Oxford University Press.
2. SimonHaykin,"CommunicationSystems",4th Edition, Wiley India.
3. H.P.Hsu&D.Mitra,"AnalogandDigitalCommunications",2nd Edition,TataMcGraw-Hill.

[BTEC-53] MICROPROCESSORS

Unit1

Evolution of microprocessors, Microprocessor architecture and its operations, 8085 pins description, programming model, basic interfacing concepts, input and output devices, logic devices and memory interfacing, addressing modes, Concept of instruction cycle, machine cycle and T-states, Concept of interrupts, Classification of 8085 instructions.

Unit 2

8086 architecture- functional diagram, register organization, memory segmentation, programming model, memory address, physical memory organization, pins description, clock generator 8284A, maximum mode and minimum mode signal descriptions, timing diagrams, introduction to DOS and BIOS interrupts.

Unit 3

Instruction formats, addressing modes, classification of instruction set, assembler directives (debug, TASM & MASM), macros, Programs techniques and assembly language programs: simple programs involves data transfer operation, arithmetic operation, logical operation, branch operation, machine control operation, string manipulations, stack and subroutine operations.

Unit 4.

8255 Programmable peripheral interfacing various mode of operation to 8086, interfacing keyboard and seven segment display, stepper motor interfacing, D/A and A/D converter, 8254 (8253) programmable interval timer, Direct Memory Access and 8237 DMA controller.

Unit 5

Memory interfacing to 8086. Interrupt structure of 8086, interrupt handling, vector interrupt table and interrupt Service routine. Interfacing interrupt controller 8259 and DMA Controller 8257 to 8086. Serial communication standards, Serial data transfer schemes.

Text Book:

1. Ramesh Gaonkar, "Microprocessor architecture, programming and applications with the 8085",5th Edition, Penram International Publication(India) Pvt. Ltd.
2. DouglasV.Hall, "Microprocessors and Interfacing",2ndEdition,TataMcGrawHill.

Reference Books:

1. SivaramaP. Dandamudi, "Introduction to Assembly Language Programing From 8086 to Pentium Processors",Springer.
2. Walter A. Triebeland Avtar Singh, "The 8088 and 8086 Microprocessors: Programming, Interfacing Software,HardwareandApplications",Pearson.
3. A.K.RayandK.M.Bhurchandi,"AdvancemicroprocessorsandPeripherals"TataMcGrawHill.
4. LylaB.Das,"TheX86Microprocessors, Architecture, Programming andInterfacing(8086toPentium)", Pearson.

[BTEC-54] Control System–I

Unit 1

Basic Components of a control system, Feedback and its effect, types of feedback control systems. Block diagrams Reduction and signal flow graphs, Modeling of Physical systems: electrical networks, mechanical systems elements, equations of mechanical systems, sensors and encoders in control systems, DC motors in control systems.

Unit 2

State-Variable Analysis: Vector matrix representation of state equation, state transition matrix, state-transition equation, relationship between state equations and high-order differential equations, relationship between state equations and transfer functions. Similarity Transformation, Decomposition of transfer functions, Controllability and observability.

Unit 3

Time domain Analysis of Control Systems: Time response of continuous data systems, typical test signals for the time response of control systems, the unit step response and time- domain specifications, Steady-State error, time response of a first order system, transient response of a prototype second order system.

Unit 4

Stability of Linear Control Systems: Bounded-input bounded-output stability continuous data systems, zero-input and asymptotic stability of continuous data systems, methods of determining stability, Routh Hurwitz criterion. Root-Locus Technique: Introduction, Properties of the Root Loci, Design aspects of the Root Loci

Unit 5

Frequency Domain Analysis: M_r (resonant peak) and ω_r (resonant frequency) and bandwidth of the prototype Second order system, effect so fading a zero to the forward path, effect so fadding a pole to the forward path, Nyquist ability criterion, relative stability: gain margin and phase margin, stability analysis with The Bode plot.

Text Book:

1. B.C. Kuo & Farid Golnaraghi, "AutomaticControlSystems",8th Edition, John Wiley India.

Reference Books:

1. WilliamA.Wolovich,"AutomaticControlSystems",OxfordUniversityPress.
2. Joseph J. DistefanoIII, AllenR.Stubberud,Ivan J.Williams,"FeedbackandControlSystems"Schaums Outlines Series,3rdEdition, Tata Mc Graw Hill.
3. I.J.Nagrath&M.Gopal,"ControlSystemEngineering",NewAgeInternationalPublishers.

[BTEC-55] Antenna and Wave Propagation

Unit1

Antennas Basics: Introduction, Basic Antenna Parameters, Patterns, Beam Area(or Beam Solid Angle) ΩA, Radiation Intensity, Beam Efficiency, Directivity D and Gain G, Directivity and Resolution, Antenna Apertures, Effective Height, The radio Communication link, Fields from Oscillating Dipole, Single-to-Noise Ratio (SNR), Antenna Temperature, Antenna Impedance.

Unit 2

Point Sources and Their Arrays: Introduction, Point Source, Power Theorem and its Application to an Isotropic Source, Radiation Intensity, Arrays of Two Isotropic Point Sources, Non-isotropic but Similar Point Sources and the Principle of Pattern Multiplication, Pattern Synthesis by Pattern Multiplication, Linear Arrays of n-Isotropic Point Sources of Equal Amplitude and Spacing, Linear Broadside Arrays with Non-uniform Amplitude Distributions. General Considerations.

Electric Dipoles, Thin Liner Antennas and Arrays of Dipoles and Apertures: The Short Electric Dipole, The Fields of a Short Dipole, Radiation Resistance of Short Electric Dipole, Thin Linear Antenna, Radiation Resistance of λ/2 Antenna, Array of Two Driven λ/2 Elements: Broadside Case and End-Fire Case, Horizontal Antennas Above a Plane Ground, Vertical Antennas Above a Plane Ground, Yagi - Uda Antenna Design, Long - Wire Antennas, folded Dipole Antennas.

Unit 3

The Loop Antenna: Design and its Characteristic Properties, Application of Loop Antennas, Far Field Patterns of Circular Loop Antennas with Uniform Current, Slot Antennas, Horn Antennas, Helical Antennas, The Log-Periodic Antenna, Micro strip Antennas.

Reflector Antennas: Flat Sheet Reflectors, Corner Reflectors, The Parabola-General Properties, A Comparison Between Parabolic and Corner Reflectors, The Paraboloidal Reflector, Patterns of Large Circular Apertures with Uniform Illumination, Reflector Types (summarized), Feed Methods for Parabolic Reflectors.

Text Book:

1. John D Krauss, Ronald J Marhefkaand Ahmad S.Khan, "Antennas and Wave Propagation", Fourth Edition,TataMcGrawHill.

Reference Books:

1. A.R.Harish,M. Sachidananda,"Antennas and Wave Propogation", Oxford University Press.
2. Edward Conrad Jordan and Keith George Balmain,"Electromagnetic Waves and Radiating Systems", PHI.
3. A.Das, Sisir K.Das,"Microwave Engineering",TataMcGrawHill.

[BTMB-51] Engineering Economics

Unit-1 Introduction to Engineering Economics and Managerial Economics Concept of Efficiency, Theory of Demand , Elasticity of Demand, Supply and Law of Supply indifference Curves, Budget Line, Welfare Analysis, Scope of Managerial Economics, Techniques and Applications of Managerial Economics.

Unit-2 Market Structure Perfect Competitions Imperfect- Monopolistic, Oligopoly, duopoly sorbent features of price determination and various market conditions.

Unit-3 Demand Forecasting and cost Estimation Characteristics of Forecasts, Forecasting Horizons, Steps to Forecasting, Forecasting Methods, Seasonal Adjustments, Forecasting Performance Measures, Cost Estimation, Elements of cost, Computation of Material Variances Break-Even Analysis.

Unit-4 Management Aspects Functions of Management, Project Management, Value Engineering, Project Evaluation, Decision Making.

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[BTEC-51P]: Integrated Circuit Lab

Objective:- To design and implement the circuits to gain knowledge on performance of the circuit and its application. These circuits should also be simulated on P-spice.

1. Log and antilog amplifiers.
2. Voltage comparator and zero crossing detectors.
3. Second order filters using operational amplifier for–
    a. Low pass filter of cut off frequency 1 KHz.
    b. High pass filter of frequency 12KHz.
    c. Band pass filter with unit gain of pass band from 1 KHz to 12 KHz.
4. Wien bridge oscillator using operational amplifier.
5. Determine capture range; lock in range and free running frequency of PLL.
6. Voltage regulator using operational amplifier to produce output of 12V with maximum load current of 50mA.
7. A/D and D/A convertor.
8. Voltage to current and current to voltage convertors.
9. Function generator using operational amplifier (sine, triangular & square wave)
10. Astable and mono stable multi vibrator using IC 555.

[BTEC-54P] Control System Lab

1. Different Tool boxes in MATLAB, Introduction to Control Systems Toolbox.
2. Determine transpose, inverse values of given matrix.
3. Plot the pole-zero configuration in s-plane for the given transfer function.
4. Determine the transfer function for given closed loop system in block diagram representation.
5. Plot unit step response of given transfer function and find peak overshoot, peak time.
6. Plot unit step response and to find rise time and delay time.
7. Plot locus of given transfer function, locate closed loop poles for different values of k.
8. Plot root locus of given transfer function and to find out S, Wd, Want given root & to discuss stability.

9. Plot bode plot of given transfer function.
10. Plot bode plot of given transfer function and find gain and phase margins
11. Plot Nyquist plot for given transfer function and to compare the irrelative stability
12. Plot the Nyquist plot for given transfer function and to discuss closed loop stability, gain and phase margin.

Note:-In addition, Institutes may include more experiments based on the expertise.

[BTEC-52P]Communication
Lab–1

1. To study DSB/SSB amplitude modulation & determine its modulation factor & power in sidebands.
2. To study amplitude demodulation by linear diode detector
3. To study frequency modulation and determine its modulation factor
4. To study PLL 565 as frequency demodulator.
5. To study sampling and reconstruction of Pulse Amplitude modulation system.
6. To study the Sensitivity, Selectivity, and Fidelity characteristics of super heterodyne receiver.
7. To study Pulse Amplitude Modulation a. using switching method
   b. by sample and hold circuit
8. To demodulate the obtained PAM signal by 2^{nd} order LPF.
9. To study Pulse Width Modulation and Pulse Position Modulation.
10. To plot the radiation pattern of a Dipole, Yagi-uda and calculate its beam width.
11. To plot the radiation pattern of Horn, Parabolic & helical antenna. Also calculate beam width & element current.
12. Design and implement an FM radio receiver in 88-108 MHz.

[BTEC-53P] Microprocessors Lab

1. Write a program using 8085/8086 Microprocessor for Decimal, Hexadecimal addition and subtraction of two Numbers.
2. Write a program using 8085/8086 Microprocessor for addition and subtraction of two BCD numbers.
3. To perform multiplication and division of two 8 bit numbers using 8085/8086.
4. To find the large stand smallest number in an array of data using 8085/8086 instruction set.
5. To write a program to arrange an array of data in ascending and descending order using 8085/8086.
6. To convert given Hexadecimal number in to its equivalent ASCII number and vice versa using 8085/8086 instruction set.
7. To write a program to initiate 8251 and to check the transmission and reception of character.
8. To interface 8253 programmable interval timer to 8085/8086 and verify the operation of 8253 in six different modes.
9. To interface DAC with 8085/8086 to demonstrate the generation of square, sawtooth and triangular wave.
10. Serial communication between two 8085/8086 through RS-232 C-port.

[BTEC-61] Microwave Engineering

Unit1

Rectangular Wave Guide: Field Components, TE, TM Modes, Dominant TE_{10} mode, Field Distribution, Power, Attenuation. Circular Waveguides: TE, TM modes. Wave Velocities, Microstrip Transmission line (TL), Coupled TL, Strip TL, Coupled Strip Line, Coplanar TL, Microwave Cavities,

Unit2

Scattering Matrix, Passive microwave devices: Microwave Hybrid Circuits, Terminations, Attenuators, Phase Shifters, Directional Couplers: Two Hole directional couplers, S-Matrix of a Directional coupler, Hybrid Couplers, Microwave Propagation in ferrites, Faraday Rotation, Isolators, Circulators, S parameter analysis of all components.

Unit3

Microwave Tubes: Limitation of Conventional Active Devices at Microwave frequency, Two Cavity Klystron, Reflex Klystron, Magnetron, Traveling Wav Tube, Backward Wave Oscillators: Their Schematic, Principle of Operation, Performance Characteristic and their applications.

Unit4

Solid state amplifiers and oscillators: Microwave Bipolar Transistor, Microwave tunnel diode, Microwave Field-effect Transistor, Transferred electron devices, Avalanche Transit

Unit5

Microwave Measurements: General setup of a microwave test bench, Slotted line carriage, VSWR Meter, microwave power measurements techniques, Crystal Detector, frequency measurement, wavelength measurements, Impedance and Refection coefficient, VSWR, Insertion and attenuation loss measurements, measurement of antenna characteristics, microwave link design.

Text Book:

1. SamuelY.Liao,"MicrowaveDevicesandCircuits",3rdEdition, Pearson Education.

Reference Books:

1. R.ECollin,"FoundationforMicrowaveEngineering",2ndEdition, John Wiley India.
2. A.DasandS.K.Das,"MicrowaveEngineering", Tata Mc Graw Hill.

[BTEC-62] Digital Communication

Unit 1

Digital Data transmission, Line coding review, Pulse shaping, Scrambling, Digital receivers, Eye diagram, Digital carrier system, Method of generation and detection of coherent & non-coherent binary ASK,FSK &PSK, Differential phase shift keying, quadrature modulation techniques.(QPSK and MSK), M-array Digital carrier Modulation.

Unit 2

Concept of Probability, Random variable, Statistical averages, Correlation, Sum of Random Variables, Central Limit Theorem, Random Process, Classification of Random Processes, Power spectral density.

Unit 3

Performance Analysis of Digital communication system: Optimum linear Detector for Binary polar signaling, General Binary Signaling, Coherent Receivers for Digital Carrier Modulations, Signal Space Analysis of Optimum Detection, Vector Decomposition of White Noise Random processes, General Expression for Error Probability of optimum receivers,

Unit 4

Spread spectrum Communications: Frequency Hopping Spread Spectrum (FHSS) systems, Direct Sequence Spread Spectrum, Code Division Multiple Access of DSSS, Multiuser Detection, OFDM Communications

Unit5

Measure of Information, Source Encoding, Error Free Communication over a Noisy Channel capacity of a discrete and Continuous Memory less channel Error Correcting codes: Hamming sphere, hamming distance and Hamming bound, relation between minimum distance and error detecting and correcting capability, Linear block codes, encoding & syndrome decoding; Cyclic codes, encoder and decoders for system attic cycle codes; convolution codes, code tree & Trellis diagram,

Text Book:

1. B.P. Lathi, "ModernDigitalandAnalogcommunicationSystems",4th Edition, Oxford UniversityPress.

Reference Books:

1. H.Taub, D.L.Schilling, G.Saha,"PrinciplesofCommunication",3rdEdition,TataMcGraw-Hill.
2. JohnG.Proakis,"DigitalCommunications", 4th Edition, Mc Graw-Hill International.
3. SimonHaykin,"CommunicationSystems",4thEdition, Wiley India.
4. H.P.HSUandD.Mitra,"AnalogandDigitalCommunications",2nd Edition, Tata McGraw-Hill.

[BTEC-63] Integrated Circuit Technology

Unit 1

Introduction To IC Technology: SSI, MSI, LSI, VLSI Integrated Circuits Crystal Growth and Wafer Preparation: Electronic Grade Silicon, Czochralski Crystal Growth, Silicon Shaping, Processing Considerations. Epitaxy: Vapor Phase Epitaxy, Molecular Beam Epitaxy, Silicon on Insulators, Epitaxial Evaluation.

Unit 2

Oxidation: Growth Kinetics, Thin Oxides, Oxidation Techniques and Systems, Oxides Properties. Lithography: Optical Lithography. Photomasks, Wet Chemical Etching. Dielectric and Polysilicon Film Deposition: Deposition Processes, Polysilicon, Silicon Dioxide, Silicon Nitride.

Unit 3

Diffusion: Diffusion of Impurities in Silicon and Silicon Dioxide, Diffusion Equations, Diffusion Profiles, Diffusion Furnace, Solid, Liquid and Gaseous Sources, Sheet Resistance and its Measurement Ion-Implantation: Ion-Implantation Technique, Range Theory, Implantation Equipment.

Unit 4

Metallization: Metallization Application, Metallization Choices, Physical Vapor Deposition, Vacuum Deposition, Sputtering Apparatus. Packaging of VLSI devices: Package Types, Packaging Design Consideration, VLSI Assembly Technologies, Package Fabrication Technologies.

Unit5

VLSI Process Integration: Fundamental Considerations For IC Processing, NMOS IC Technology, CMOS IC Technology, Bipolar IC Technology, Monolithic and Hybrid Integrated Circuits, IC Fabrication

Text Books:

1. S.M.Sze, "VLSI Technology",2nd Edition, Mc Graw–Hill Publication.
2. S.K.Ghandhi, "VLSI Fabrication Principles",2nd Edition,Willy-India Pvt. Ltd.

Reference Books:

1. J. D. Plummer, M. D. Deal and Peter B. Griffin, "Silicon VLSI Technology: Fundamentals, practice and modelling", Pearson Education.
2. StephenA.Campbell,"Fabrication Engineering at the micro and nano scale",Oxford University Press.

[BTEC-64] Digital Signal Processing

Unit1

Realization of Digital Systems: Introduction, direct form realization of IIR systems, cascade realization of an IIR systems, parallel form realization of an IIR systems, Ladder structures: continued fraction expansion of H(z), example of continued fraction, realization of a ladder structure, example of a ladder realization

Unit2

Design of Infinite Impulse Response Digital Filters: Introduction to Filters, Impulse Invariant Transformation, Bi-Linear Transformation, All-Pole Analog Filters: Butterworth and Chebyshev, Design of Digital Butterworth and Chebyshev Filters.

Unit3

Finite Impulse Response Filter Design: Windowing and the Rectangular Window, Other Commonly Used Windows, Examples of Filter Designs Using Windows, The Kaiser Window.

Unit4

Discrete Fourier Transforms: Definitions, Properties of the DFT, Circular Convolution, Linear Convolution.

Unit5

Fast Fourier Transform Algorithms: Introduction, Decimation –In Time (DIT) Algorithm, Computational Efficiency, Decimation in Frequency (DIF) Algorithm.

Text Book:

1. Johnny R. Johnson, "Digital Signal Processing",PHI.

Reference Books:

1. John G Prokias, Dimitris G Manolakis,"Digital Signal Processing",Pearson Education.
2. Oppenheim & Schafer, "Digital Signal Processing"PHI.
3. SanjitK.Mitra,"DigitalSignalProcessing:AComputer-BasedApproach",4th Edition, Mc Graw Hill.
4. Monson Hayes, "Digital Signal Processing",2nd Edition, Mc Graw Hill Education

[BTEC-65] Industrial Electronics

Unit 1

Power Semiconductor Devices: Power semiconductor devices their symbols and static characteristics and specifications of switches, types of power electronic circuits Operation, steady state & switch characteristics & switching limits of Power Transistor Operation and steady state characteristics of Power MOSFET and IGBT Thyristor– Operation V-I characteristics, two transistor model, methods of turn-on Operation of GTO ,MCT and TRIAC

Unit 2

Phase Controlled Rectifiers: Phase Angle Control, Single-phase Half-wave Controlled Rectifier (One quadrant), Single-phase Full-wave Controlled Rectifier (Two quadrant Converters), Performance Factors of Line-commutated Converters, The Performance Measures of Two-pulse Converters, Three phase Controlled Converters **Inverters:** Introduction Thyristor Inverter Classification, Series Inverters, Parallel Inverter, Three-phase Bridge Inverters, Three-phase Bridge Inverter with Input-circuit Commutation

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Unit 3

Choppers: Introduction, Principle of Chopper Operation, Control Strategies, step-up/Down Chopper, Jones Chopper. Introduction to basic Cyclo - converters.

Control of D.C. Drives: Introduction, Basic Machine Equations, Breaking Modes, Schemes for D.C. Motor Speed Control, Single-phase Separately Excited Drives, Braking Operation of Rectifier Controlled Separately excited Motor, Single phase Separately Excited Drives, Power Factor Improvement, Three-phase Separately Excited Drives, D.C. Chopper Drives

Unit 4

Control of A.C. Drives: Introduction, basic Principle of Operation, Squirrel-cage Rotor Design, Speed Control of Induction Motors, stator Voltage Control, Variable Frequency control, Rotor Resistance Control, Slip Power Recovery Scheme, Synchronous Motor Drives

Text Books:

1. M.H.Rashid,"PowerElectronics",3rdEdition,PearsonEducation.

Reference Books:

1. M.D. Singh & K. Khanchandani, "Power Electronics", Tata Mc Graw Hill.
2. V.R .Moorthy, "Power Electronics: Devices, Circuits and Industrial Applications", Oxford University Press, 2007.
3. M.S. Jamil Asghar, "Power Electronics", PHI.
4. Ned Mohan, T.M. Undelandand W.P. Robbins, "Power Electronics: Converters, Applications and Design", Wiley India

BTMB-61 : INDUSTRIAL MANAGEMENT

Unit-I Introduction: Concept, Development, application and scope of Industrial Management. Productivity: Definition, measurement, productivity index, types of production system, Industrial Ownership.

Unit-II Management Function: Principle of Management – Time and motion study, work simplification – process charts and flow diagrams, Production Planning.

Unit-III Inventory Control: Inventory, Cost, Deterministic Models, Introduction to supply chain management.

Unit-IV Quality Control: Process control, SQC, Control charts, Single, Double and Sequential Sampling, Introduction to TQM.

Laboratory

[BTEC-61P] Antenna and Microwave Lab

1. Study of Reflex Klystron Characteristics.
2. Measurement of guide wavelength and frequency of the signal in a rectangular Wave guide using slotted line carriage in a Microwave Bench.
3. Measurement of impedance of an unknown load connected at the output end of the Slotted line carriage in a Microwave Bench.
4. Determine the S-parameter of any Three port Tee.
5. Determine the S-parameter of a Magic Tee.
6. Study various parameters of Isolator.
7. Measurement of attenuation of a attenuator and isolation, insertion loss, cross coupling of a circulator.
8. Determine coupling coefficient, Insertion loss, Directivity and Isolation coefficient of an ty Multi-Hole directional coupler.
9. To study working of MIC Components like Microstrip Line, Filter, Directional Coupler, Wilkinson Power Divider, Ring resonator & coupler, antennas & amplifies.
10. Study of wave guide horn and its radiation pattern and determination of the beam width.
11. Study radiation pattern of any two types of linear antenna.

[BTEC-62P]COMMUNICATION LAB–II

1. To construct a triangular wave with the help of Fundamental Frequency and its Harmonic component.
2. To construct a Square wave with the help of Fundamental Frequency and its Harmonic component.
3. Study of Pulse code modulation (PCM) and its demodulation using Bread Board.
4. Study of delta modulation and demodulation and observe effect of slope overload.
5. Study of pulse data coding techniques for NRZ formats.
6. Study of Data decoding techniques for NRZ formats.
7. Study of Manchester coding and Decoding.
8. Study of Amplitude shift keying modulator and demodulator.
9. Study of Frequency shift keying modulator and demodulator.
10. Study of Phase shift keying modulator and demodulator
11. Study of single bit error detection and correction using Hamming code.
12. Measuring the input impedance and Attenuation of a given Transmission Line

[BTEC-65P] CAD OF ELECTRONICS LAB

P SPICE Experiments

1. (a) Transient Analysis of BJT inverter using step input.
   (b) DC Analysis (VTC) of BJT inverter with and without parameters.
2. (a) Transient Analysis of NMOS inverter using step input.
   (b) Transient Analysis of NMOS inverter using pulse input.
   (c) DC Analysis (VTC) of NMOS inverter with and without parameters.
3. (a) Analysis of CMOS inverter using step input.
   (b) Transient Analysis of CMOS inverter using step input with parameters.
   (c) Transient Analysis of CMOS inverter using pulse input.
   (d) Transient Analysis of CMOS inverter using pulse input with parameters.
   (e)DC Analysis (VTC) of CMOS inverter with and without parameters.

4. Transient & DC Analysis of NOR Gate inverter.
5. Transient & DC Analysis of NAND Gate.
6. VHDL Experiments
    a. Synthesis and simulation of Full Adder.
    b. Synthesis and simulation of Full Subtractor.
    c. Synthesis and Simulation of 3X8 Decoder.
    d. Synthesis and Simulation of 8X1 Multiplexer.
    e. Synthesis and Simulation of 9 bit odd parity generator.
    f. Synthesis and Simulation of Flip Flop (D, and T)