

ADIKAVI NANNAYA UNIVERSITY:: RAJAMAHENDRAVARAM
UNIVERSITY COLLEGE OF ENGINEERING
ELECTRONICS AND COMMUNICATION ENGINEERING
COURSE STRUCTURE

B.Tech, Four Year Degree Course
(From the admitted batch of 2017-2018 under CBCS Scheme)



UNIVERSITY COLLEGE OF ENGINEERING
ADIKAVI NANNAYA UNIVERSITY
RAJAMAHENDRAVARAM – 533 296

IIIRD B TECH (ECE) STRUCTURE & SYALLBUS**III B.Tech I Semester ECE w.e.f 2017-18**

Sub Code	Subject	Hrs/Week		Max Marks		Total Marks	Credits
		Theory	Lab	Internal	External		
BTECE501	LINEAR IC APPLICATIONS	4	--	25	75	100	4
BTECE502	DIGITAL IC APPLICATIONS	4	--	25	75	100	4
BTECE503	COMPUTER ORGANIZATION	4	--	25	75	100	4
BTECE504	MANAGEMENT SCIENCE	4	--	25	75	100	4
BTECE505	DIGITAL COMMUNICATIONS	4	--	25	75	100	4
BTECE506	ANTENNAS AND WAVE PROPAGATION	4	--	25	75	100	4
BTECE507	ANALOG AND DIGITAL COMMUNICATIONS LAB	--	3	50	50	100	2
BTECE508	LINEAR & DIGITAL IC APPLICATIONS LAB	--	3	50	50	100	2
BTECE509	*MOOCS	--	--	50	--	50	--
Total		24	06	300	550	850	28

*The Credits of the MOOCS course will not be considered for SGPA/CGPA calculation

BTECE501: LINEAR IC APPLICATIONS**Theory : 4 Hrs/week****Credits : 4****Int marks: 25****Ext marks : 75****UNIT-I**

INTEGRATED CIRCUITS: Classification, Differential Amplifier- DC and AC analysis of Dual input Balanced output Configuration, Properties of other differential amplifier configuration, DC Coupling and Cascade Differential Amplifier Stages, Level translator.

OPERATIONAL AMPLIFIERS: Ideal Characteristics, Op-amp Block Diagram, ideal and practical Op-amp Specifications, DC and AC characteristics, 741 op-amp & its features, Op-Amp parameters.

APPLICATIONS OF OP-AMPS: Inverting and Non-inverting Amplifiers, Integrator, Differentiator, Comparator, Multivibrators, Logarithmic Amplifiers, AC amplifier, V to I, I to V converters, Instrumentation Amplifiers (using IC741 and IC TL08).

UNIT-II

ACTIVE FILTERS & OSCILLATORS: Design & Analysis of Butterworth active filters – 1st order, 2nd order LPF, HPF filters. Band pass, Band reject and all pass filters. Four Quadrant Multiplier, IC 1496, Sample & Hold circuits. Wien-bridge and Quadrature Oscillator, saw-tooth, square wave, Square wave generator, Voltage Controlled Oscillators.

UNIT-III

TIMERS & PHASE LOCKED LOOPS: Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger; PLL - introduction, block schematic, principles and description of individual blocks, 565 PLL, Applications of PLL – frequency multiplication, frequency translation, Applications of VCO (566).

UNIT-IV

DIGITAL TO ANALOG AND ANALOG TO DIGITAL CONVERTERS: Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, and IC 1408 DAC, Different types of ADCs – parallel Comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC. DAC and ADC Specifications, Specifications AD 574 (12 bit ADC).

TEXT BOOKS:

1. Linear Integrated Circuits – D. Roy Choudhury, New Age International (p) Ltd, 2nd Edition, 2003.
2. Ramakant A. Gayakward, “Op-amps and linear Integrated circuits”, LPE, 4th edition, Pearson Education.

REFERENCES BOOKS:

1. Operational Amplifiers & Linear Integrated Circuits – Sanjay Sharma ; SK Kataria & Sons; 2nd Edition, 2010.
2. David A. Bell, “Operational amplifiers and Linear ICs”, PHI, EEE, 1997.
3. Operational Amplifiers – C.G. Clayton, Butterworth & Company Publ. Ltd./Elsevier, 1971.

BTECE502: DIGITAL IC APPLICATIONS**Theory: 4 Hrs/week****Credits : 4****Int Marks: 25****Ext Marks : 75****UNIT-I**

CMOS Logic Families and Interfacing: Introduction to logic families, CMOS logic, Design Logic Gates Using CMOS Logic, CMOS steady state and dynamic electrical behavior, CMOS logic families. Bipolar logic, transistor-transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic.

UNIT-II

Introduction to VHDL: Design flow, program structure, levels of abstraction, Elements of VHDL: Data types, data objects, operators and identifiers. Packages, Libraries and Bindings, Subprograms. VHDL Programming using structural and data flow modelling, Behavioural Modelling- Process statement, variable assignment statement, signal assignment statement, wait statement, if statement, case statement, null statement, loop statement, exit statement, next statement, assertion statement.

UNIT-III

Combinational Logic Design: Binary Adder-Subtractor, Ripple Adder, Look Ahead Carry Generator, ALU, Decoders, encoders, Multiplexers and demultiplexers, Parity Circuits, Comparators, Barrel Shifter, Simple Floating-Point Encoder, Dual Priority Encoder, Design considerations of the above combinational logic circuits with relevant Digital ICs, modeling of above ICs using VHDL.

UNIT-IV

Sequential Logic Design: SSI Latches and flip flops, Ring Counter, Johnson Counter, Design of Modulus N Synchronous Counters, Shift Registers, Universal Shift Registers, Design considerations of the above sequential logic circuits with relevant Digital ICs, modeling of above ICs using VHDL.

PLDs & Memories: Programmable Read Only Memory, Programmable Logic Array, Programmable Array Logic, ROM: Internal structure, 2D-Decoding, Commercial ROM types, timing and applications,. Static RAM: Internal structure, SRAM timing, synchronous SRAMS, Dynamic RAM: Internal structure, timing, synchronous DRAMs.

Text Books:

1. VHDL Primer – J. Bhasker, Pearson Education/ PHI, 3rd Edition.

2. Digital Design Principles & Practices – John F. Wakerly, PHI/ Pearson Education Asia, 3rd Ed., 2005.

Reference Books:

1. Fundamentals of Digital Logic with VHDL Design- Stephen Brown, Zvonko Vranesic, McGrawHill, 3rd Edition.

BTECE503: COMPUTER ORGANIZATION**Theory: 4 Hrs/weeks****Credits: 4****Int Marks: 25****Ext Marks: 75****UNIT-I**

Basic Computer Organization: basic computer organisation: instruction codes-stored program organisation, indirect address, computer register, computer instructions, timing and control, instruction cycle, memory reference instructions, design of accumulator logic, general register origination, stack originations , instruction formats, addressing modes.

UNIT-II

Input-Output Organizations: Input-output organisation: I/O Interface, asynchronous data transfer-strobe control, hand shaking ,asynchronous communication interface, modes of transfer, direct memory access(DMA)-DMA- controller, DMA transfer, input-output processor(IOP).

UNIT-III

Memory Organizations: Memory Hierarchy, Main Memory, RAM, ROM Chips, Memory Address Map, Memory Connection to CPU, Associate Memory, Cache Memory, Miss and Hit Ratio, Access Time, Associative, Set Associative Mapping, Introduction to Virtual Memory.

UNIT-IV

8085 CPU: Introduction to Intel 8085 microprocessor architecture –ALU, Timing and control Unit, register, data &address Bus, 8085 pin configuration, Instruction set of Intel 8085-Data transfer group, architecture group, logical group, branch &control group, addressing modes of 8085, assembly language programs involving evaluation of architecture Expressions .

TEXT BOOKS:

1. Computer System Architecture: Morris Mano.
2. Fundamentals of microprocessor and microcomputer: B.ram-DhanapatRai publications..

REFERENCE BOOKS:

- 1 Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI.
1. Structured Computer Organization and Design - Andrew S. Tanenbaum, 4th Edition PHI/Pearson.
2. Fundamentals or Computer Organization and Design – Sivaraama Dandamudi Springer Int. Edition.
3. Computer Architecture a quantitative approach, Jhon L. Hennessy and David A. Patterson, Fourth Edition Elsevier.

BTECE504: MANAGEMENT SCIENCE**Theory : 4 Hrs/week****Credits : 4****Int Marks : 25****Ext Marks : 75****UNIT -I**

Introduction to Management and Organizational Concepts of Management and organization- nature, importance and Functions of Management, Systems Approach to Management – Taylor’s Scientific Management Theory — Fayal’s Principles of Management — Maslow’s theory of Hierarchy of Human Needs — Douglas McGregor’s Theory X and Theory V — Herzberg Two Factor Theory of Motivation – Leadership Styles, Social responsibilities of Management. Designing Organizational Structures: Basic concepts related to Organization –Departmentation and Decentralization.

UNIT-II

Human Resources Management (HRM): Concepts of HRM, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Wage and Salary Administration, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating — Capability Maturity Mode’ (CMM) Levels — Performance Management System.

Strategic Management and Contemporary Strategic Issues: Mission, Goals, Objectives, Policy, Strategy, Programmers, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Bench Marking and Balanced Score Card as Contemporary Business Strategies.

UNIT -III

Operations Management: Principles and Types of Plant Layout Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement — Business Process Reengineering (BPR) -Objectives of inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and, JIT System,

UNIT -IV

Project Management Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), identifying critical path, Probability of Completing the project within given time. Marketing Management - Supply Chain Management, Functions of Marketing, Marketing Mix, and marketing Strategies based on Product Life Cycle, Channels of distribution.

TEXT BOOKS

1. Stoner, Freeman, Gilbert, Management, 6th Ed, Pearson Education, New Delhi, 2004
2. P. Vijaya Kumar, N. Appa Rao and Ashima B. Chhalill, Cengage Learning India Pvt Ltd. 2012.
3. Kotler Philip and Keller Kevin Lane: Marketing Management, Pearson, 2012.
4. Koontz and Weihrich: Essentials of Management, McGraw Hill, 2012.

REFERENCES

1. Thomas N.Duening and John M.Ivancevich Management—Principles and Guidelines, Biztantra, 2012.
2. KanishkaBedi, Production and Operations Management, Oxford University Press, 2012.
3. Samuel C.Certo: Modern Management, 2012.

BTECE505: DIGITAL COMMUNICATIONS**Theory: 4 Hrs/week****Credits : 4****Int Marks: 25****Ext Marks : 75****UNIT-I**

PULSE DIGITAL MODULATION: Elements of digital communication systems, advantages of digital communication systems, Sampling, Quantization & Coding, Quantization error, Companding in PCM systems. Differential PCM systems (DPCM). Delta modulation, its draw backs, adaptive delta modulation, comparison of PCM and DM systems, noise in PCM and DM systems.

UNIT-II

DIGITAL MODULATION TECHNIQUES: Introduction, ASK, FSK, PSK, DPSK, DEPSK, QPSK, M-ary PSK, ASK, FSK, similarity of BFSK and BPSK.

DATA TRANSMISSION : Base band signal receiver, probability of error, the optimum filter, matched filter, probability of error using matched filter, coherent reception, non-coherent detection of FSK, calculation of error probability of ASK, BPSK, BFSK, QPSK.

UNIT-III

INFORMATION THEORY: Discrete messages, concept of amount of information and its properties. Average information, Entropy and its properties. Information rate, Mutual information and its properties.

SOURCE CODING: Introductions, Advantages, Shannon's theorem, Shannon-Fanon coding, Huffman coding, efficiency calculations, channel capacity of discrete and analog Channels, capacity of a Gaussian channel, bandwidth –S/N trade off.

UNIT-IV

LINEAR BLOCK CODES: Introduction, Matrix description of Linear Block codes, Error detection and error correction capabilities of Linear block codes, Hamming codes, Binary cyclic codes, BCH Codes.

CONVOLUTION CODES: Introduction, encoding of convolution codes, time domain approach, transform domain approach. Graphical approach: state, tree and trellis diagram decoding using Viterbi algorithm.

TEXT BOOKS:

1. Digital communications - Simon Haykin, John Wiley, 2005
2. Principles of Communication Systems – H. Taub and D. Schilling, TMH, 2003

REFERENCES:

1. Digital and Analog Communication Systems - Sam Shanmugam, John Wiley, 2005
2. Digital Communications – John Proakis, TMH, 1983.
3. Communication Systems Analog & Digital – Singh & Sapre, TMH, 2004
4. Modern Analog and Digital Communication – B.P.Lathi, Oxford reprint, 3rd edition, 2004

BTECE506: ANTENNAS AND WAVE PROPAGATION**Theory: 4 Hrs/week****Credits: 4****Int Marks: 25****Ext Marks: 75****UNIT- I**

RADIATION AND ANTENNA: Antenna Definition and Functions, Radiation Mechanism, Single wire, 2-wire, Dipoles, Properties of Antennas, Antenna Parameters, Polarization, Basic Antenna Elements, Radiation Mechanisms, radiation fields of alternating current element, Evolution of field component, Radiation Power and Radiation resistance of Current element, Hertzian Dipole, Different current Distributions in Linear antennas, Radiation from Halfwave Dipole, Radiation from Quadrature Monopole, Radiation Characteristics of Dipoles.

UNIT – II:

ANALYSIS OF LINEAR ARRAYS: Directional characteristics of dipole Antenna, radiation Patterns, Expressions of Center fed Vertical dipoles of finite length, Radiation patterns of center fed Vertical dipoles and Horizontal dipoles, Two element Uniform Array, Uniform Linear Arrays, Field strength of a Uniform linear array, First sidelobe Ratio(SLR), Broadside and Endfire Arrays, Patterns of array of non Isotropic radiators, Radiation Pattern Characteristics, Binomial arrays, Effect of Earth on vertical patterns, Methods of Excitation, Impedance Matching techniques, transmission Loss between transmitting and Receiving antennas, Antenna temperature, Friis Formulae, Signal to Noise Ratio.

UNIT- III

HF, VHF, UHF ANTENNAS: Directional antennas, Omni-directional Antennas, Resonant antennas, Non resonant antennas, LF antennas for HF, VHF, UHF dipole arrays, Folded dipole, V and Inverted antennas, Rhombic antennas, Yagi-Uda antennas, Log-periodic, Loop, Helical, Ferrite, Notch Antennas.

UNIT-IV

WAVE PROPAGATION: Propagation characteristics of EM waves, Ground Wave, Tropospheric, Ionospheric and Sky Wave Propagations, Ground wave Field strength by Maxwell's Equations, Reflection of radio waves by the surface of the Earth, Roughness of Earth, reflection of Earth, Reflection Fraction of Earth, Tilt of the Ground, Atmosphere Effects in Space wave, Duct Propagation, Troposcatter, Fading of EM waves, Line Of Sight, Characteristics of Ionosphere, Refractive Index of Ionosphere, Phase and Group Velocities, Mechanism of Reflection and Refraction, Characteristic Parameters of Ionospheric Propagation, Sky Wave Field Strength, Diversity Techniques.

TEXT BOOKS:

1. Antennas for All Applications – John D. Kraus J. Marhefka, 3rd Edition, TMH, 2003,
2. Antennas and Wave Propagation, G.S.N.Raju, Pearson Education (Singapore) Pvt. Ltd. New Delhi

REFERNECE BOOKS:

1. Antenna theory – C.A. Balnis, John Wiley and Sons, 2nd Edition 2001.
2. Antennas and Wave Propagation-K.D. Prasad, Satya Prakashan,tech India Publications,New Delhi,2001
3. Electronic and Propagation- F.E. terman, McGraw-Hill,4thEdition, 1955.

BTECE507: ANALOG & DIGITAL COMMUNICATIONS LAB

Lab :3 Hrs/week

Credits :2

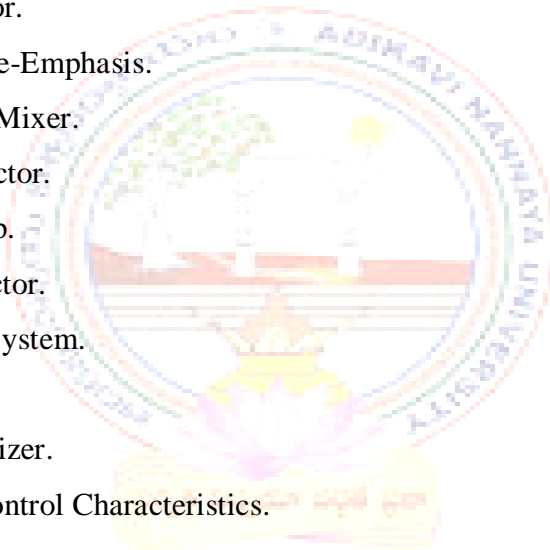
Int marks:50

Ext marks :50

List of Experiments :

Part -A (Any 8 Experiments Should Be Done)

1. Amplitude Modulation & De- Modulation.
2. Diode Detector Characteristics.
3. Frequency Modulation And De-Modulation.
4. Balanced Modulator.
5. Pre-Emphasis & De-Emphasis.
6. Characteristics Of Mixer.
7. Digital Phase Detector.
8. Phase Locked Loop.
9. Synchronous Detector.
10. Single Side Band System.
11. Squelch Circuit.
12. Frequency Synthesizer.
13. Automatic Gain Control Characteristics.



Part -B (Any 6 Experiments Should Be Done)

1. Phase Shift Keying.
2. Time Division Multiplexing And De-Multiplexing.
3. Pulse Code Modulation.
4. Differential Pulse Code Modulation.
5. Frequency Shift Keying.
6. Phase Shift Keying.
7. Delta Modulation.
8. Companding And Expanding.

BTECE508: LINEAR & DIGITAL IC APPLICATIONS LAB

Lab :3 Hrs/week

Credits :2

Int marks:50

Ext marks :50

LIST OF EXPERIMENTS :

PART -A (ANY 8 EXPERIMENTS SHOULD BE DONE)

1. Study of Op-Amp.
2. Integrator And Differentiator Using IC 741.
3. Active Filters – LPF & HPF Using IC 741.
4. RC Phase Shift Oscillator Using IC 741.
5. Wein Bridge Oscillator Using IC 741.
6. D/A Conversion Using IC 741.
7. Monostable Multivibrator Using 555 Timer.
8. Astable Multivibrator Using 555 Timer.
9. Schmitt Trigger Using 555 Timer.
10. Phase Locked Loop Using 555 Timer.

PART -B (ANY 8 EXPERIMENTS SHOULD BE DONE)

1. Realization Of Logic Gates.
2. 3 To 8 Decoder Using IC 74138.
3. 8:1 Multiplexer Using IC 74151 And 2:1 De-Multiplexer Using IC 74155.
4. 4 Bit Comparator Using IC 7485.
5. D Flip- Flop Using IC 7474.
6. Decade Counter Using IC 7490.
7. 4 Bit Counter Using 7493.
8. Shift Register Using IC 7495.
9. Universal Shift Register Using IC 74194/195.
10. Ram (16x4) Using IC 74189 (Read and Write Operations).

BTECE509: MOOCS
Guidelines

1. A student shall select any one course of his/her choice from the list of courses specified in the course structure as approved by the B.O.S.
2. A student can complete the course at his/her own place, under the guidance of a faculty member.
3. The assessment of MOOC is through continuous internal assessment for 50 Marks with the breakup as follows. (No of Hrs/Week? No of Credits?)
 - a. Assignment - 5M
 - b. Online quiz - 10M (Organized by the concerned faculty)
 - c. Certification – 10M (NPTEL, Swayam, Edx, Course era, Udemy or any other MOOC Platform) or participation certificate in any workshop/conference in IITs/ NITs/Premier Institute/Industry of not less than 3 days.
 - d. Internal Assessment – 25M (Exam to be conducted at the end of the course)
4. Marks acquired by the students will be submitted along with the Internal Marks of Practical Exams duly signed by concerned faculty and Head of the Department.
5. Though 2 credits of 50 marks are allowed for moocs course they are not included in SGPA calculations
6. Producing of course completion certificate is mandatory by every student by the end of semester where the moocs course is opted.
7. As MOOC aligns closer with Practical Exam, Pass or Fail status in the MOOC will be on par with Practical Exam Guidelines of UG.
8. It is not mandatory to specify in the marks memo the course in which certification is obtained as the courses change from year to year.
9. The above guidelines are subject to change from time to time to comply with the UGC/AICTE guidelines, any other academic regulatory body at the state/center and academic body of the University.