



ACE Engineering College

Ankushapur(V), Ghatkesar(M), Medchal.Dist - 501 301

(An Autonomous Institutions)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

II B.TECH. COURSE STRUCTURE & SYLLABUS

II Year				I Semester				
S. No.	Course Type	Course Code	Course Title	% of Deviation	Periods Per Week			Credits
					L	T	P	
1	PCC	EC301PC	Electronic Devices and Circuits	0	3	1	0	4
2	PCC	EC302PC	Network Analysis and Transmission Lines	3	3	0	0	3
3	PCC	EC303PC	Switching Theory and Logic Design	5	3	1	0	4
4	PCC	EC304PC	Signals and Systems	0	3	1	0	4
5	ESC	EC305ES	Probability Theory and Stochastic Processes	0	3	0	0	3
6	PCC	EC306PC	Electronic Devices and Circuits Lab	0	0	0	2	1
7	PCC	EC307PC	Digital Logic Design Lab	10	0	0	2	1
8	PCC	EC308PC	Basic Simulation Lab	0	0	0	2	1
9	MC	MC309HS	Constitution of India	0	3	0	0	0
10	MC	MC310EC	Fundamentals of Data Structures	-	2	0	0	0
11	MC	MC311	Advanced Python Programming	-	0	0	2	0
Total					20	3	8	21

II Year				II Semester				
S. No.	Course Type	Course Code	Course Title	% of Deviation	Periods Per Week			Credits
					L	T	P	
1	BSC	MA402BS	Numerical Methods, Complex Variables & Statistical Inference	20	3	1	0	4
2	PCC	EC402PC	Electromagnetic Fields and Waves	0	3	0	0	3
3	PCC	EC403PC	Analog and Digital Communications	1	3	1	0	4
4	PCC	EC404PC	Analog and Pulse Circuits	0	3	0	0	3
5	PCC	EC405PC	Linear and Digital Integrated Circuits	10	3	0	0	3
6	PCC	EC406PC	Analog and Digital Communications Lab	0	0	0	3	1.5
7	PCC	EC407PC	Analog and Pulse Circuits Lab	20	0	0	3	1.5
8	PCC	EC408PC	Linear and Digital Integrated Circuits Lab	10	0	0	2	1
9	MC	MC409HS	Gender Sensitization Lab	0	0	0	2	0
10	MC	MC410EC	Electronic Circuit Design Lab	-	0	0	2	0
Total					15	2	12	21

MA402BS: NUMERICAL METHODS, COMPLEX VARIABLES AND STATISTICAL INFERENCE

B.Tech. II Year II Semester									
Course Code	Category	Hours/Week			Credits	Maximum Marks			
MA402BS	BSC	L	T	P	C	CIA	SEE	Total	
		3	1	-	4	30	70	100	
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: Nil			Total Classes: 60				

Prerequisite: Mathematical Knowledge at pre-university level

Course Objectives: To learn

1. Various methods to find roots of an equation.
2. Concept of finite differences and to estimate the value for the given data using interpolation.
3. Evaluation of integrals using numerical techniques
4. Solving ordinary differential equations using numerical techniques.
5. Differentiation and integration of complex valued functions.
6. Evaluation of integrals using Cauchy's integral formula and Cauchy's residue theorem.
7. Expansion of complex functions using Taylor's and Laurent's series.
8. The sampling theory and testing of hypothesis and making inferences

Course Outcomes: After learning the contents of this paper the student must be able to

1. Find the root of a given equation.
2. Estimate the value for the given data using interpolation
3. Find the numerical solutions for a given ODE's
4. Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
5. Taylor's and Laurent's series expansions of complex Function
6. Apply statistical methods for analysing experimental data

Unit - 1 Numerical Methods – I

Solution of polynomial and transcendental equations – Bisection method, Iteration Method, Newton-Raphson method and Regula-Falsi method. Finite differences- forward differences- backward differences-central differences-symbolic relations and separation of symbols; Interpolation using Newton's forward and backward difference formulae. Central difference interpolation: Gauss's forward and backward formulae; Lagrange's method of interpolation

Unit - 2 Numerical Methods – II

Numerical integration: Trapezoidal rule and Simpson's 1/3rd and 3/8 rules. Ordinary differential equations: Taylor's series; Picard's method; Euler and modified Euler's methods; Runge-Kutta method of fourth order.

Unit - 3 Complex Variables (Differentiation)

Limit, Continuity and Differentiation of Complex functions. Cauchy-Riemann equations (without proof), Milne-Thomson methods, analytic functions, harmonic functions, finding harmonic conjugate; elementary analytic functions (exponential, trigonometric, logarithm) and their properties.

Unit - 4 Complex Variables (Integration)

Line integrals, Cauchy's theorem, Cauchy's Integral formula, Liouville's theorem, Maximum-Modulus theorem (All theorems without proof); zeros of analytic functions, singularities, Taylor's series, Laurent's series; Residues, Cauchy Residue theorem (without proof)

Unit - 5

Statistical Inference

Inference Concerning Means- Estimations- point estimation, interval estimation, Bayesian estimation, reliability, Confidence interval estimates of population parameters, Estimation confidence interval for means, Maximum Likelihood.

Test of hypothesis – Null Hypothesis and Test of hypothesis- Type I and Type II errors -Test of hypothesis concerning single mean, two means, proportion- The relation between test and confidence intervals - Goodness of fit test.

Text Books:

1. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010
2. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, keying Ye, Probability and statistics for engineers and scientists, 9th Edition, Pearson Publications.

Reference Books:

1. M. K. Jain, SRK Iyengar, R.K. Jain, Numerical methods for Scientific and Engineering Computations, New Age International publishers.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3. Complex Variables with Applications by PonnusamySaminathan, Birkhäuser Publisher.
4. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.

Web References:

E-Text Books:

1. <https://www.pdfdrive.com/higher-engineering-mathematics-d181992980.html>
2. <http://www.elcom-hu.com/Mshtrk/Statstics/9th%20txt%20book.pdf>
3. <https://soaneemrana.org/onewebmedia/ADVANCED%20ENGINEERING%20MATHEMATICS%20BY%20ERWIN%20ERESZIG1.pdf>
4. <https://namitatiwaridotorg.files.wordpress.com/2017/10/ponnusamy-s-silverman-h-1-complex-variables-with-applications.pdf>

EC402PC: ELECTROMAGNETIC FIELDS AND WAVES

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
EC402PC	Core	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45			
Prerequisite: Applied Physics								
Course Objectives:								
<ol style="list-style-type: none"> 1. To learn the Basic Laws, Concepts and proofs related to Electrostatic Fields and Magnetostatic Fields, and apply them to solve physics and engineering problems. 2. To distinguish between static and time-varying fields, and understand the significance and utility of Maxwell's Equations and Boundary Conditions, and gain ability to provide solutions to communication engineering problems. 3. To analyze the characteristics of Uniform Plane Waves (UPW), determine their propagation parameters and estimate the same for dielectric and dissipative media. 4. To conceptually understand the waveguides and to determine the characteristics of rectangular waveguides, microstriplines. 								
Course Outcomes: Upon completing this course, the student will be able to								
<ol style="list-style-type: none"> 1. Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and Magneto static Fields. 2. Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions. 3. Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest. 4. To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems. 								
Unit - 1	Electrostatics							
Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density. Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations, Capacitance – Parallel Plate, Coaxial, Spherical Capacitors.								
Unit - 2	Magnetostatics							
Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law.								
Unit - 3	Maxwell's Equations (Time Varying Fields)							

Faraday's Law and Transformer EMF, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Forms, Conditions at a Boundary Surface - Dielectric-Dielectric and Dielectric-Conductor Interfaces.

Unit - 4 | **EM Wave Characteristics**

Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definitions, Relation between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization. Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem.

Unit - 5 | **Waveguides**

Electromagnetic Spectrum and Bands. Rectangular Waveguides – Solution of Wave Equations in Rectangular Coordinates, TE/TM mode analysis, Expressions for Fields, Characteristic Equation and Cut-off Frequencies, Dominant and Degenerate Modes, Sketches of TE and TM mode fields in the cross-section, Phase and Group Velocities, Wavelengths and Impedance Relations, Equation of Power Transmission, Impossibility of TEM Mode. Microstrip Lines – Zo Relations, Effective Dielectric Constant.

Text Books:

1. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, 8th Ed., McGrawHill, 2014
2. Principles of Electromagnetics – Matthew N.O. Sadiku and S.V. Kulkarni, 6th Ed., Oxford University Press, Aisan Edition, 2015.

Reference Books:

1. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, 2nd Ed., 2000, PHI.
2. Engineering Electromagnetics – Nathan Ida, 2nd Ed., 2005, Springer (India) Pvt. Ltd., New Delhi.

Web References:

1. <http://nptel.ac.in/courses/108106073/> 1 to 108106073/42
2. <http://emt-iiith.vlabs.ac.in/>
3. <http://emt-iiith.vlabs.ac.in/Experiment.php?code=C001toC010>

E-Text Books:

1. http://qeee.in/coursepack/generate_books/generated_books/1975/
2. <https://digital-library.theiet.org/content/subject/b5000>
3. <https://digital-library.theiet.org/content/books/ew/sbew037e>

EC403PC: ANALOG AND DIGITAL COMMUNICATIONS

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
EC403PC	Core	L	T	P	C	CIA	SEE	Total
		3	1	-	4	30	70	100
Contact Classes: 45	Tutorial Classes: 15	Practical Classes: Nil			Total Classes: 60			
Prerequisite: Signals & Systems, Probability theory and Stochastic Processes								
Course Objectives: <ol style="list-style-type: none"> 1. To develop ability to analyze system requirements of analog and digital communication systems. 2. To understand the generation, detection of various analog and digital modulation techniques. 3. To acquire theoretical knowledge of each block in AM, FM transmitters and receivers. 4. To understand the concepts of baseband transmissions. 								
Course Outcomes: Upon completing this course, the student will be able to <ol style="list-style-type: none"> 1. Analyze and design of various continuous wave and angle modulation and demodulation techniques 2. Understand the effect of noise present in continuous wave and angle modulation techniques. 3. Attain the knowledge about AM, FM Transmitters and Receivers 4. Analyze and design the various Pulse Modulation Techniques. 5. Understand the concepts of Digital Modulation Techniques and Baseband transmission. 								
Unit - 1	AMPLITUDE MODULATION							
Introduction to Communication System , Need for modulation, Amplitude Modulation - Time and Frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves - Switching modulator, Detection of AM Waves - Envelope detector, DSBSC modulation - time and frequency domain description, Generation of DSBSC Waves - Balanced Modulators, Coherent detection of DSB-SC Modulated waves, COSTAS LOOP, SSB modulation - Time and Frequency domain description, Frequency discrimination and Phase discrimination methods for generating SSB, Demodulation of SSB Waves, principle of Vestigial sideband modulation.								
Unit - 2	ANGLE MODULATION							
Basic concepts of Phase Modulation, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave using Bessel functions, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Signal- Armstrong Method, Detection of FM Signal: Balanced slope detector, Phase locked loop, Comparison of FM and AM., Concept of Pre-emphasis and de-emphasis.								
Unit - 3	WAVEFORM CODING							
Pulse Modulation: Types of Pulse modulation- PAM, PWM and PPM. Comparison of FDM and TDM. Pulse Code Modulation: PCM Generation and Reconstruction, Quantization Noise, Non-Uniform Quantization and Companding, DPCM, Adaptive DPCM, DM and Adaptive DM, Noise in PCM and DM.								
Unit - 4	DIGITAL MODULATION TECHNIQUES							

Digital Modulation Techniques: ASK- Modulator, Coherent and Non-coherent ASK Detector, FSK- Modulator, Coherent and Non-Coherent FSK Detector, BPSK- Modulator, Coherent BPSK Detection. Differential PSK, Principles of QPSK and QAM.

Baseband Data Transmission: Introduction, Baseband Binary PAM systems, ISI, Nyquist criterion for distortion less transmission ,Baseband Pulse Shaping, Introduction to Correlative coding, Optimum Transmitting and Receiving Filters, Eye Diagrams, Receiving Filters- Matched Filter, Correlation receiver, Adaptive Equalization

Unit - 5 | **TRANSMITTER & RECEIVERS**

Transmitters: Classification of Transmitters, AM Transmitters, FM Transmitters

Receivers: Radio Receiver - Receiver Types - Tuned radio frequency receiver, Super heterodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, Image frequency, AGC, Amplitude limiting, FM Receiver, Comparison of AM and FM Receivers.

Text Books:

1. Analog and Digital Communications – Simon Haykin, JohnWiley,2005.
2. Analog and Digital Communication – K. Sam Shanmugam, Willey,2005

Reference Books:

1. Principles of Communication Systems - Herbert Taub, Donald L Schilling, Goutam Saha,3rd Edition,McGraw-Hill,2008.
2. Electronic Communications – Dennis Roddy and John Coolean , 4thEdition ,PEA,2004
3. Electronics & Communication System – George Kennedy and Bernard Davis, TMH2004
4. Electronics Communication Systems-Fundamentals through Advanced-Wayne Tomasi, 5thEdition, 2009, PHI
5. Analog and Digital Communications By SanjaySharma

Web References:

E-Text Books:

1. <https://gctjaipur.files.wordpress.com/2015/08/an-introduction-to-analog-and-digital-communications-2nd-edition.pdf>
2. https://gradeup-question-images.grdp.co/liveData/f/2017/12/Advanced_Electronic_Communications_Systems_0130453501.pdf-86.pdf
3. <https://soaneemrana.org/onewebmedia/ELECTRONICS%20COMMUNICATION%20SYSTEM%20BY%20GEORGE%20KENNEDY.pdf>

EC404PC: ANALOG AND PULSE CIRCUITS

B.TECH II YEAR II SEMESTER								
COURSE CODE	CATEGORY	HOURS/WEEK			CREDITS	MAXIMUM MARKS		
EC404PC	CORE	L	T	P	C	CIA	SEE	TOTAL
		3	0	0	3	30	70	100
CONTACT CLASSES:45	TUTORIAL CLASSES: Nil	PRCTICAL CLASSESS:NIL				TOTAL CLASSES :45		
PREREQUISITES: ELECTRONIC DEVICES AND CIRCUITS								
COURSE OBJECTIVE: <ol style="list-style-type: none"> 1. Learn the concepts of high frequency analysis of transistors. 2. To give understanding of various types of amplifier circuits such as small signal, cascaded, large signal and tuned amplifiers. 3. To familiarize the Concept of feedback in amplifiers so as to differentiate between negative and positive feedback. 4. To construct various multivibrators using transistors and sweep circuits. 								
COURSE OUTCOME: Upon successful completion of this course, students should be able to: <ol style="list-style-type: none"> 1. Design the multistage amplifiers and understand the concepts of High Frequency Analysis of Transistors. 2. Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations. 3. Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications. 4. Design multivibrators and sweep circuits for various applications. 								
Unit - 1	Multistage Amplifiers & Transistor at High Frequency							
Multistage Amplifiers Classification of Amplifiers, Distortion in amplifiers, Different coupling schemes used in amplifiers, Frequency response and Analysis of multistage amplifiers, Cascode amplifier, Darlington pair.								
Transistor at High Frequency Hybrid - model of Common Emitter transistor model, f_{α} , β and unity gain bandwidth, Gain-bandwidth product.								
Unit - 2	Feedback Amplifiers							
Feedback Amplifiers Concepts of feedback – Classification of feedback amplifiers – General characteristics of Negative feedback amplifiers – Effect of Feedback on Amplifier characteristics – Voltage series, Voltage shunt, Current series and Current shunt Feedback configurations.								
Unit - 3	Oscillators							
Oscillators Condition for Oscillations, RC type Oscillators-RC phase shift and Wien-bridge Oscillators, LC type Oscillators – Generalized analysis of LC Oscillators, Hartley and Colpitts Oscillators, Frequency and amplitude stability of Oscillators, Crystal Oscillator.								
Unit - 4	Large Signal Amplifiers & Tuned Amplifiers							

Large Signal Amplifiers

Class A Power Amplifier- Series fed and Transformer coupled, Conversion Efficiency, Class B Power Amplifier- Push Pull and Complimentary Symmetry configurations, Conversion Efficiency, Principle of operation of Class AB and Class C Amplifiers.

Tuned Amplifiers

Single Tuned Amplifiers – Q-factor, frequency response of tuned amplifiers, Concept of stagger tuning and synchronous tuning.

Unit - 5**Multivibrators and Time Base Generators****Multivibrators**

Types of Triggering, Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using Transistors.

Time Base Generators

General features of a Time base Signal, Methods of Generating Time Base Waveform, concepts of Transistor Miller and Bootstrap Time Base Generator, Methods of Linearity improvement.

TEXT BOOKS:

1. Integrated Electronics, Jacob Millman, Christos C Halkias, McGraw Hill Education.
2. Microelectronics by Sedra & Smith, 5th Edition, 2009, Oxford

REFERENCE BOOKS:

1. Electronic Devices Conventional and current version - Thomas L. Floyd 2015, Pearson.
2. Electronic Devices and Circuits theory – Robert L. Boylestad, Louis Nashelsky, 11th Edition, 2009, Pearson
3. Electronic Devices and Circuits, David A. Bell – 5th Editions, Oxford.
4. Pulse, Digital and Switching Waveforms – J. Millman, H. Taub and Mothiki S. Prakash Rao, 2^{ed.}, 2008, Mc GrawHill.

WEB REFERENCES:

1. <https://www.youtube.com/watch?v=BAkaeYBZTZ4>
2. <https://www.youtube.com/watch?v=-bz6u7IF1gM>
3. <https://www.youtube.com/watch?v=m4sjTt7rhow>
4. <https://www.youtube.com/watch?v=M3yI0byaqKc>
5. <https://www.youtube.com/watch?v=huDZjQcEBMg>
6. <https://www.youtube.com/watch?v=XQ3TJsYdtTY>
7. <https://www.youtube.com/watch?v=M1ZY0LoIkBw>

E TEXT BOOKS:

1. <https://www.e-booksdirectory.com/details.php?ebook=8466>
2. <https://www.e-booksdirectory.com/details.php?ebook=1109>

EC405PC: LINEAR AND DIGITAL INTEGRATED CIRCUITS

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
EC405PC	Core	L	T	P	C	CIA	SEE	Total
		3	-	-	3	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45			
Prerequisite: Switching Theory and Logic Design								
Course Objectives: The main objectives of the course are: <ol style="list-style-type: none"> 1. To introduce the basic building blocks of linear integrated circuits. 2. To introduce the theory and applications of analog multipliers and PLL. 3. To introduce the concepts of waveform generation and introduce some special function ICs. 4. To understand and implement the working of basic digital circuits. 								
Course Outcomes: Upon completing this course, the student will be able to <ol style="list-style-type: none"> 1. A thorough understanding of operational amplifiers with linear integrated circuits. 2. Attain the knowledge of functional diagrams and applications of IC 555 and IC 565. 3. Acquire the knowledge about the Data converters. 4. Understanding of the different families of digital integrated circuits and their characteristics. 								
Unit - 1	Operational Amplifier							
Ideal and Practical Op-Amp, Op-Amp Characteristics, DC and AC Characteristics, Features of 741 Op-Amp, Modes of Operation - Inverting, Non-Inverting, Differential, Instrumentation Amplifier, AC Amplifier, Differentiators and Integrators, Comparators, Schmitt Trigger, Introduction to Voltage Regulators, Features of 723 Regulator, Three Terminal Voltage Regulators.								
Unit - 2	Op-Amp, IC-555 & IC 565 Applications							
Introduction to Active Filters, Characteristics of Band pass, Band reject and All Pass Filters, Analysis of 1st order LPF & HPF Butterworth Filters, Waveform Generators – Triangular, Sawtooth, Square Wave, IC555 Timer - Functional Diagram, Monostable and Astable Operations, Applications, IC565 PLL - Block Schematic, principle and Applications.								
Unit - 3	Data Converters							
Introduction, Basic DAC techniques, Different types of DACs-Weighted resistor DAC, R-2R ladder DAC, Inverted R-2R DAC, Different Types of ADCs - Parallel Comparator Type ADC, Counter Type ADC, Successive Approximation ADC and Dual Slope ADC, DAC and ADC Specifications.								
Unit - 4	Combinational Logic ICs							
Specifications and Applications of TTL-74XX & CMOS 40XX Series ICs - Code Converters, Decoders, LED & LCD Decoders with Drivers, Encoders, Priority Encoders, Multiplexers, Demultiplexers, Priority Generators/Checkers, Parallel Binary Adder/Subtractor, Magnitude Comparators.								
Unit - 5	Sequential Logic IC's and Memories							
Familiarity with commonly available 74XX & CMOS 40XX Series ICs – All Types of Flip-flops, Synchronous Counters, Decade Counters, Shift Registers. Memories - ROM Architecture, Types of ROMs & Applications, RAM Architecture, Static & Dynamic RAMs.								
Text Books:								
<ol style="list-style-type: none"> 1. Op-Amps & Linear ICs – Ramakanth A. Gayakwad, PHI, 2003. 2. Digital Fundamentals – Floyd and Jain, Pearson Education, 8th Ed., 2005. 								

Reference Books:

1. Linear Integrated Circuits –D. Roy Chowdhury, New Age International (p) Ltd, 2nd Ed.,2003.
2. Digital Design Principles and Practices – John. F. Wakerly, Pearson 3rd Ed.,2009.
3. Linear Integrated Circuits and Applications – Salivahana, TMH,2008.
4. Operational Amplifiers with Linear Integrated Circuits, 4th Ed., William D.Stanley, Pearson Education India,2009.

Web References:

- 1.<https://nptel.ac.in/courses/108/108/108108111/>

E-Text Books:

1. https://www2.mvcc.edu/users/faculty/jfiore/OpAmps/OperationalAmplifiersAndLinearICs_3E.pdf
2. <http://kavediasir.yolasite.com/resources/Linear%20Integrated%20Circuit%202nd%20Edition%20-%20D.%20Roy%20Choudhary.pdf>
3. https://www.ti.com/lit/an/sboa092b/sboa092b.pdf?ts=1593701507095&ref_url=https%253A%252F%252Fwww.google.com%252F
4. http://www.miedema.dyndns.org/co/2018/Op_Amp_Applications_Handbook-Walt-Jung_2005.pdf

EC406PC: ANALOG AND DIGITAL COMMUNICATIONS LAB

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	Total
EC406PC	Core	-	-	3	1.5	30	70	100
		Contact Classes: Nil			Tutorial Classes: Nil		Practical Classes: 45	

Prerequisite: Matlab

Course Objectives:

The course should enable the students to:

1. Study various modulation techniques in communications.
2. Visualize various spectrums using spectrum analyzer.
3. Observe receiver characteristics.
4. Understand the importance of AGC and VCO

Note:

- Minimum 12 experiments should be conducted:
- All these experiments are to be simulated first either using MATLAB, COMSIM or any other simulation package and then to be realized in hardware

List of Experiments:

1. (i) Amplitude modulation and demodulation (ii) Spectrum analysis of AM
2. (i) Frequency modulation and demodulation (ii) Spectrum analysis of FM
3. DSB-SC Modulator & Detector
4. SSB-SC Modulator & Detector (Phase Shift Method)
5. Frequency Division Multiplexing & Demultiplexing
6. Pulse Amplitude Modulation & Demodulation
7. Pulse Width Modulation & Demodulation
8. Pulse Position Modulation & Demodulation
9. PCM Generation and Detection
10. Delta Modulation
11. Frequency Shift Keying: Generation and Detection
12. Binary Phase Shift Keying: Generation and Detection
13. Generation and Detection (i) DPSK (ii) QPSK

List of Equipment Required:

1. CROs: 20MHz
2. Function Generators: 2MHz
3. Spectrum Analyzer
4. Regulated Power Supplies: 0-30V
5. MATLAB Lab/Equivalent Simulation Package with Communication toolbox
6. Analog and Digital Modulation and Demodulation Trainer Kits.

EC407PC: ANALOG AND PULSE CIRCUITS LAB

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
EC407PC	Core	-	-	2	1	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 30			Total Classes: 30			

Prerequisite: Electronic Devices & Circuits

Course Objectives:

The course should enable the students to:

1. Simulate and analyze single stage and multistage amplifiers and oscillators.
2. Demonstrate the principles of feedback amplifiers and oscillators through simulation.
3. Analyze the characteristics of different multivibrators

Note:

- Experiments marked with * has to be designed, simulated and verified in hardware.
- Minimum of 9 experiments to be done in hardware.

Hardware Testing in Laboratory:

1. Common Emitter Amplifier(*)
2. Two Stage RC Coupled Amplifier
3. Cascode amplifier Circuit(*)
4. Darlington Pair Circuit
5. Current Shunt Feedback amplifier Circuit
6. Voltage Series Feedback amplifier Circuit(*)
7. RC Phase shift Oscillator Circuit(*)
8. Wien-Bridge Oscillator Circuit
9. Hartley and Colpitt's Oscillator Circuits
10. Class A power amplifier
11. Class B Complementary symmetry amplifier(*)
12. Design of Astable Multivibrator
13. Design of Monostable Multivibrator
14. The output voltage waveform of Miller Sweep Circuit
15. The output voltage waveform of bootstrap Sweep Circuit
16. Design a Bistable Multivibrator and draw its waveforms
17. Response of Schmitt Trigger circuit for loop gain less than and greater than one
18. Response of a transistor Current sweep circuit

List of Equipment Required:

1. Computer System with latest specifications connected
2. Window XP or equivalent
3. Simulation software-Multisim or any equivalent simulation software
4. Regulated Power Suppliers, 0-30V
5. 20 MHz, Dual Channel Cathode Ray Oscilloscopes.
6. Functions Generators-Sine and Square wave signals
7. Multimeters
8. Electronic Components

EC408PC: LINEAR AND DIGITAL INTEGRATED CIRCUITS LAB

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
EC408PC	Core	-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 45			Total Classes: 45			

Prerequisite: Electronic Devices & Circuits

Course Objectives:

- To understand the basics of linear integrated circuits and available ICs.
- To apply operational amplifiers in linear and nonlinear applications.

List of Experiments:

- Note:** 1. Verify the functionality of the IC in the given application.
2. Minimum 12 experiments are to be done.

Design and Implementation of:

1. Inverting and Non-Inverting Amplifiers using OpAmps
2. Adder and Subtractor using OpAmp.
3. Comparators using OpAmp.
4. Integrator Circuit using IC741.
5. Differentiator Circuit using OpAmp.
6. Active filter Applications-LPF, HPF (First Order)
7. IC 741 waveform Generators-Sine, Square wave and Triangular Waves.
8. Mono-Stable Multivibrator using IC555.
9. Astable multivibrator using IC555.
10. Schmitt Trigger Circuit using IC 741.
11. IC 565-PLL Applications.
12. Voltage Regulator using IC723
13. Three terminal voltage regulators-7805, 7809, 7912

List of Equipment Required:

1. 5 V Fixed Regulated Power Supply/ 0-5V or more Regulated Power Supply.
2. 20 MHz Oscilloscope with Dual Channel.
3. Bread board and components/
4. Analog Trainer Kit.
5. Multimeter

MC409HS: GENDER SENSITIZATION LAB

B.Tech. II Year II Semester

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
MC409HS	MC	-	-	2	0	30	70	100
		Contact Classes: 30			Tutorial Classes: Nil		Practical Classes: Nil	

COURSE DESCRIPTION

This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality.

This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender-based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

Course Objectives:

1. To develop students' sensibility with regard to issues of gender in contemporary India.
2. To provide a critical perspective on the socialization of men and women.
3. To introduce students to information about some key biological aspects of genders.
4. To expose the students to debates on the politics and economics of work.
5. To help students reflect critically on gender violence.
6. To expose students to more egalitarian interactions between men and women.

Course Outcomes:

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.
6. Students will develop a sense of appreciation of women in all walks of life.
7. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

Unit - 1	UNDERSTANDING GENDER
Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste.	
Unit - 2	GENDER ROLES AND RELATIONS
Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles- Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences- Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary	
Unit - 3	GENDER AND LABOUR
Division and Valuation of Labour-Housework: The Invisible Labor- “My Mother doesn’t Work.” “Share the Load.”-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work. -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming	
Unit - 4	GENDER - BASED VIOLENCE
The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective- Sexual Harassment: Say No! -Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: “Chupulu”. Domestic Violence: Speaking Out Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-“I Fought for my Life....”	
Unit - 5	GENDER AND CULTURE
Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks- The Brave Heart.	
<p>Note: Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.</p> <p>➤ <i>Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments. Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on “Gender”.</i></p> <p>ESSENTIAL READING: The Textbook, “<i>Towards a World of Equals: A Bilingual Textbook on Gender</i>” written by A.Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu published by Telugu Akademi, Telangana Government in 2015.</p>	
ASSESSMENT AND GRADING:	

1. Discussion & Classroom Participation:20%
2. Project/Assignment:30%
3. End Term Exam:50%

MC410EC: ELECTRONIC CIRCUIT DESIGN LAB

B.Tech. II Year II Semester								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
MC410EC	MC	L	T	P	C	CIA	SEE	Total
		-	-	2	0	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 30			Total Classes: 30			

Prerequisite: Electronic Devices & Circuits

List of Minor Projects

1. Design of Crystal Testing circuit using diodes and resistances
2. Design of Fire alarm system using diode, resistances and relay.
3. Design of Battery voltage monitor system using diode, resistances and operational amplifiers.
4. Design of zener diode voltage regulator circuit for 5.1volts.
5. Design and verify voltage regulator circuit using LM317 voltage regulator.
6. Design of multi-purpose power supply circuit using different types of voltage regulators.
7. Design of mini amplifier circuit using transistor PNP8550.
8. Design of Half Watt Amplifier circuit using transistors 2N2222 and 2N2907.
9. Design of one transistor Automatic Battery Charger.
10. Design of Tiny amplifier for Hearing Aid using transistors 2N3904 and BD139.
11. Design of Mini Hi-Fi 2 watt amplifier circuit using IC741.
12. Design of Buzzer with progressive Beep rate using IC4060.
13. Design of MOSFET based DC motor speed controller.
14. Design of PWM DC Motor control circuit with IC555.
15. Design of Enhanced Speed control circuit using IC556.
16. Design of ICE Warning circuit for automobiles using IC741.
17. Design of PIR motion detector circuit using IC555 or IC8050 or BC547.
18. Design of wireless mobile charger circuit using IC555.
19. Design of gas detection system circuit using IC555.
20. Design of Automatic drip irrigation system using IC555 and soil sensor.
21. Design of Security alarm circuit using IC555 and PIR sensor.

TEXTBOOK: Microelectronics-circuit analysis and design, Donald A. Neamen, Fourth edition, McGraw-hill. **REFERENCES:** Microelectronic circuits, Sedra and Smith, Oxford University Press.

CATALOG DESCRIPTION: Diode circuits, transistor and biasing, Basic transistor amplifiers, Frequency response, Transistor current sources, Differential amplifiers, Multistage amplifiers, Digital circuits and logic gates.

REFERENCE BOOKS:

1. Sensor Technology Hand Book – Jon Wilson, Newne 2004.
2. Instrument Transducers – An Introduction to their Performance and design – by Herman K.P. Neubrat, Oxford University Press.
3. Measurement system: Applications and Design – by E.O. Doebelin, McGraw Hill Publications.
4. Electronic Instrumentation by H.S. Kalsi.