BVC COLLEGE OF ENGINEERING(A)
(An AUTONOMOUS Institution)
(Approved by AICTE, Permanently Affiliated to JNTUK, Kakinada)
(Accredited by NAAC with 'A' Grade)
Included under section 2(f) & 12(b) of UGCAct, 1956
Palacharla Post, East Godvari District, Andhra Pradesh, India – 533294
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REG: VR23

B.Tech.– II Year I Semester Course Structure

S.No.	Category	Subject Code	Subject Name	L	T	P	Credits
1	Basic Science	23BS3T05	Probability theory and stochastic Process	3	0	0	3
2	HSMC	23HM3T02	Universal Human Values–Understanding Harmony andEthical Human Conduct	2	1	0	3
3	Engineering Science	23ES3T05	Signals and Systems	3	0	0	3
4	Professional Core	23EC3T02	Electronic Devices and Circuits	3	0	0	3
5	Professional Core	23EC3T03	Switching Theory and Logic Design	3	0	0	3
6	Professional Core	23EC3L02	Electronic Devices and Circuits Lab	0	0	3	1.5
7	Professional Core	23EC3L03	Switching Theory and Logic Design Lab	0	0	3	1.5
8	Skill Enhancement Course	23CS3S01	Data Structures using Python	0	1	2	2
9	Audit Course	23AC3T01	Environmental Science	2	0	0	0
	Total			16	2	08	20

B.Tech. II Year II Semester Course Structure

S.No.	Category	Subject Code	Subject Name	L	T	P	Credits
1	HSMC	23HM4T03	Managerial Economics and Financial Analysis	2	0	0	2
2	Engineering Science	23ES4T09	Linear Control Systems	3	0	0	3
3	Professional Core	23EC4T04	Electromagnetic Waves and Transmission Lines	3	0	0	3
4	Professional Core	23EC4T05	Electronic Circuit Analysis	3	0	0	3
5	Professional Core	23EC4T06	Analog Communications	3	0	0	3
6	Professional Core	23EC4L04	Signals and Systems Lab	0	0	3	1.5
7	Professional Core	23EC4L05	Electronic Circuit Analysis lab	0	0	3	1.5
8	Skill Enhancement course	23HM4S01	Soft Skills	0	1	2	2
9	Engineering Science	23ES4L05	Design Thinking & Innovation	1	0	2	2
	Total			15	1	10	21
	Basic Science	23BS5P01	Mandatory Community Service Project Internship of 08 weeks duration during summer Vacation				

Department of Electronics and Communication Engineering(BVCCE)

II Year II Semester	Managerial Economics and Financial Analysis	L	T	P	C
		2	0	0	2

Course Objectives:

- To inculcate the basic knowledge of microeconomics and financial accounting
- To make the students learn how demand is estimated for different products. input output relationship for optimizing production and cost
- To Know the Various types of market structure and pricing methods and strategy
- To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions.
- To provide fundamental skills on accounting and to explain the process of preparing financial statements.

UNIT - I Managerial Economics

Introduction – Nature, meaning. significance, functions, and advantages. Demand-Concept. Function. Law of Demand - Demand Elasticity- Types – Measurement. Demand Forecasting- Factors governing Forecasting, Methods. Managerial Economics and Financial Accounting and Management.

UNIT - II Production and Cost Analysis

Introduction – Nature, meaning, significance, functions and advantages. Production Function– Least- cost combination– Short run and long run Production Function- Isoquants and Is costs, Cost & Break-Even Analysis - Cost concepts and Cost behaviour- Break-Even Analysis (BEA) - Determination of Break-Even Point (Simple Problems).

UNIT - III Business Organizations and Markets

Introduction – Forms of Business Organizations- Sole Proprietary - Partnership - Joint Stock Companies - Public Sector Enterprises. Types of Markets - Perfect and Imperfect
Competition - Features of Perfect Competition Monopoly- Monopolistic Competition– Oligopoly-Price-Output Determination - Pricing Methods and Strategies

UNIT - IV Capital Budgeting

Introduction – Nature, meaning, significance. Types of Working Capital, Components. Sources of Short-term and Long-term Capital, Estimating Working capital requirements. Capital Budgeting– Features. Proposals, Methods and Evaluation. Projects – Pay Back Method, Accounting Rate of Return (ARR) Net Present Value (NPV) Internal Rate Return (IRR) Method (sample problems)

UNIT - V Financial Accounting and Analysis

Introduction – Concepts and Conventions- Double-Entry Bookkeeping, Journal, Ledger, Trial Balance-Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Introduction to Financial Analysis - Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability.

Textbooks:
1. Varshney & Maheswari: Managerial Economics, Sultan Chand.
2. Aryasri: Business Economics and Financial Analysis, 4/e, MGH.

Reference Books:
1. Ahuja Hl Managerial economics Schand.
2. S.A. Siddiqui and A.S. Siddiqui: Managerial Economics and Financial Analysis, New Age International.
3. Joseph G. Nellis and David Parker: Principles of Business Economics, Pearson, 2/e, New Delhi.
4. Domnick Salvatore: Managerial Economics in a Global Economy, Cengage.

Department of Electronics and Communication Engineering(BVCCE)

Online Learning Resources:

https://www.slideshare.net/123ps/managerial-economics-ppt
https://www.slideshare.net/rossanz/production-and-cost-45827016
https://www.slideshare.net/darkyla/business-organizations-19917607
https://www.slideshare.net/balarajbl/market-and-classification-of-market
https://www.slideshare.net/ruchi101/capital-budgeting-ppt-59565396
https://www.slideshare.net/ashu1983/financial-accounting

Course Outcomes:

COs	Statements	Blooms Level
CO1	Student able to Define the concepts related to Managerial Economics, financial accounting and management	BL2
CO2	Student able to Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets	BL2
CO3	Student able to Apply the Concept of Production cost and revenues for effective Business decision	BL3
CO4	Student able to Analyze how to invest their capital and maximize returns	BL4
CO5	Student able to Evaluate the capital budgeting techniques. & Develop the accounting statements and evaluate the financial performance of business entity	BL5

Course Co-Ordinator's
1. Mrs B SANDHYA

BoS Chairperson

Dr. K. Veerabbayi	Dr. B. Aseesh Babu	Dr. Demudu Naidu Jureddi	Dr.K.Sree Ramesh
Chairperson	Subject Expert	Subject Expert	JNTUK Nominee

Department of Electronics and Communication Engineering(BVCCE)

II Year II Semester	Linear Control Systems	L	T	P	C
		3	0	0	3

Course objectives:

- To introduce the concepts of open loop and closed loops systems, mathematical models of mechanicaland electrical systems, and concepts of feedback
- To study the characteristics of the given system in terms of the transfer function and introducing various approaches to reduce the overall system for necessary analysis.
- To develop the acquaintance in analyzing the system response in time-domain and frequency domain interms of various performance indices.
- To analyze the system in terms of absolute stability and relative stability by different approaches
- To design different control systems for different applications as per given specifications
- To introduce the concepts of state variable analysis, design and also the concepts of controllability and observability.

UNIT-I: INTRODUCTION
Concepts of System, Control Systems: Open Loop and closed loop control systems and their differences. Different examples of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models, Differential equations, Impulse Response and transfer functions. Translational and Rotational mechanical systems

UNIT-II: TRANSFER FUNCTIONRE PRESENTATION
Transfer Function of DC Servo motor - AC Servo motor- Synchro-transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples –Block diagram algebra– Representation by Signal flow graph-Reduction using mason's gain formula.

TIMERESPONSEANALYSIS: Standard test signals– Time response of first order systems– Characteristic Equation of Feedback control systems, Transient response of second order systems– Time domains pecifications–Steadystateresponse-Steadystateerrorsanderrorconstants.

UNIT-III: STABILITY ANALYSIS IN S-DOMAIN
The concept of stability–Routh's stability criterion–qualitative stability and conditional stability–limitations of Routh'sstability100

Root Locus Technique: The root locus concept-construction of root loci-effects of adding poles and zeros to G(s) H(s) on the root loci.

UNIT-IV: FREQUENCY RESPONSE ANALYSIS
Introduction, Correlation between time and frequency response, Polar Plots, Bode Plots, Nyquist Stability Criterion

UNIT-V: CLASSICAL CONTROL DESIGN TECHNIQUES
Compensation techniques–Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers. State Space Analysis of Continuous Systems Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations-State Transition Matrix and it's Properties– Concepts of Controllability and Observability.

TEXT BOOKS:
1. Automatic Control Systems 8th edition–byB.C.Kuo–Johnwileyandson's, 2003.

3. Control Systems Engineering– by I.J.Nagrath and M.Gopal, New Age International (P) Limited, Publishers ,2nd edition, 2007
4. Modern Control Engineering–by Katsuhiko Ogata–Pearson Publications, 5thedition, 2015.

REFERENCEBOOKS:

1. Control Systems by A.Nagoorkani, RBA publications, 3edition, 2017.
2. Control Systems by A.Anand kumar, PHI, 2Edition, 2014.

Online Learning Resources:

- http://nptel.ac.in/courses/108101037/
- http://ocw.mit.edu/courses/aeronautics-and-astronautics/16-30-feedback-control-systems-fall- 2010/

Course Outcomes:

COs	Statements	BL
CO1	Student able to Understand the concepts of open loop and closed loop systems, mathematical models of mechanical and electrical systems, and concepts of feedback	BL2
CO2	Student able to Find the transfer function and to design the control system in time-domain	BL1
CO3	Student able to Analyze the system in terms of absolute stability and relative stability by different approaches	BL4
CO4	Student able to Analyze the system response in frequency domain in terms of various performance indices.	BL4
CO5	Student able to Understand the state space approach for the analysis of control systems	BL2

Course Co-Ordinator's
1. Mr.P.Veenneswarrao
2. Ms.P. Mercy Priya

BoS Chairperson

Dr. Jagadeesh Bodapati, Ph.D Professor&Head Department ECE, BVCCE, Rajahmundray Chairperson	Dr. N V Narasimha Sarma, Professor, Department of ECE, NIT Warangal, Subject Expert	Dr. M Ramasubba Reddy, Professor, Dept of applied Mechanics, IIT Chennai, Subject Expert	Dr.A.Mallikarjuna Prasad, Professor, Dept of ECE, UCEK,JNTUK, Kakinada JNTUK Nominee	Dr.M.Venkateswara Rao, ASIC Scinor Verification Engineer, ACL Digital, Bangalor Industrial Expert	Mr.Venkatesh Nukella, Assistant Professor(Ph.D), Department of ECE, Aditya Engineering College, Surampalem. Invitee From Alumni

II Year II Semester	Electromagnetic Waves and Transmission Lines	L	T	P	C
		3	0	0	3

Course Objectives:

The main objectives of this course are to:
- Understand the fundamentals of electric fields, coulomb's law and gauss law
- Familiar with of Biot-Savart Law, Ampere's Circuital Law and Maxwell equations
- Aware of electromagnetic wave propagation in dielectric and conducting media
- Study the equivalent circuit of transmission lines and parameters of the transmission lines
- Learn the working of smith chart and its usage in the calculation of transmission line parameters

COURSE PRE-REQUISITES:

UNIT-I : Transmission Lines – I

Types, Parameters, T & π Equivalent Circuits, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line .Lossless lines ,distortion less lines, Illustrative Problems.

UNIT-II: Transmission Lines–II

Input Impedance Relations, Reflection Coefficient, VSWR, Shorted Lines, Open Circuited Lines, and Matched Lines, Low loss radio frequency and UHF Transmission lines, UHFLines as Circuit Elements, Smith Chart–Construction and Applications, Quarter wave transformer, Single Stub Matching, Illustrative Problems.
- Review of Co-ordinate Systems

UNIT- III: Electrostatics

Coulomb's Law, Electric Field Intensity, Electric Flux Density, Gauss Law and Applications, Electric Potential, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems. Convection and Conduction Currents, Dielectric Constant, Poisson's and Laplace's Equations; Capacitance – Coaxial Capacitors, Illustrative Problems.

UNIT- IV: Magnetostatics

Biot's-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magneto static Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances , Magnetic Energy, Illustrative Problems.

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 Final Forms and Word Statements, Conditions at a Boundary Surface, Illustrative Problems.

UNIT-V :EM Wave Characteristics

Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves –Definition, All Relations Between E&H, Sinusoidal Variations, Wave Propagation in Lossy dielectrics, lossless dielectrics, free space, wave propagation in good conductors, skin depth, Polarization & Types, Illustrative Problems. 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, Illustrative Problems.

TEXTBOOKS:

1. Elements of Electromagnetic–Matthew N.O.Sadiku, Oxford University Press, 7thedition, 2018.
2. Electromagnetic Waves and Radiating Systems–E.C.JordanandK.G.Balmain, PHI, 2ndEdition, 2008.

REFERENCEBOOK:

1. Engineering Electromagnetics–William H.Hayt, JohnA.Buck, Jaleel M.Akhtar, TMH, 9thedition, 2020.
2. Electromagnetic Field Theory and Transmission Lines–G.S.N.Raju,PearsonEducation2006
3. Electromagnetic Field Theory and Transmission Lines: G Sasi Bhushana Rao, WileyIndia2013.

4. Networks, Lines and Fields John D.Ryder, Second Edition, Pearson Education, 2015.

Online Learning Resources:

- https://www.youtube.com/watch?v=0zWFU0Bvtqg
- https://www.slideshare.net/slideshow/electrostaticscoulombs-law-electric-field- problems/244505962
- https://www.slideshare.net/slideshow/electromagnetic-theory-and-transmission-lines-by-dr-r-prakash-rao/147744274
- https://archive.nptel.ac.in/courses/108/104/108104087/

Course Outcomes:

COs	Statements	BL
CO1	Student able to Explain the primary and secondary constants of different types of transmission lines.	BL2
CO2	Student able to Simplify the expressions for input impedance, reflection coefficient, and VSWR of transmission lines and calculate these parameters using smith chart.	BL4
CO3	Student able to Solve electric field intensity using coulomb's law and Gauss law.	BL3
CO4	Student able to Solve magnetic field intensity using Biot's- Savarts Law and Ampere's Circuital Law and Maxwell's Equations.	BL3
CO5	Student able to Analyze the electromagnetic wave propagation in dielectric and conducting media.	BL4

Course Co-Ordinator's
1. Mr.Y.Ramana Murty
2. Mr.K.Anji babu

BoS Chairperson

	ON line	ONLINE	A.m.prasad	ON line	
Dr. Jagadeesh Bodapati, Ph.D Professor&Head Department ECE, BVCCE, Rajahmundray Chairperson	Dr. N V Narasimha Sarma, Professor, Department of ECE, NIT Warangal, Subject Expert	Dr. M Ramasubba Reddy, Professor, Dept of applied Mechanics, IIT Chennai, Subject Expert	Dr.A.Mallikarjuna Prasad, Professor, Dept of ECE, UCEK,JNTUK, Kakinada JNTUK Nominee	Dr.M.Venkateswara Rao, ASIC Senior Verification Engineer, ACL Digital, Bangalor Industrial Expert	Mr.Venkatesh Nukella, Assistant Professor(Ph.D), Department of ECE, Aditya Engineering College, Surampalem, Invitee From Alumni

II Year II Semester	Electronic Circuit Analysis	L	T	P	C
		3	0	0	3

Course Objectives:

The main objectives of this course are:

- To learn hybrid-π parameters at high frequency and compare with low frequency parameters.
- Learn and understand the purpose of cascading of single stage amplifiers and derive the overall voltage gain
- Analyze the effect of negative feedback on amplifier characteristics and derive the characteristics.
- Learn and understand the basic principle of oscillator circuits and perform the analysis of different oscillator circuits.
- Compare and analyze different Power amplifiers like Class A, Class B, Class C, Class AB andother types of amplifiers.
- Analyze different types of tuned amplifier circuits.

UNIT-1: Small Signal High Frequency Transistor Amplifier models

BJT:Transistor at high frequencies, Hybrid-π common emitter transistor model,Hybrid π conductance, Hybridπ capacitances, validity of hybrid π model, determination of high-frequency parameters in terms of low-frequency parameters , CE short circuit current gain, current gain with resistive load, cut-off frequencies, frequency response and gain band width product.

FET: Analysis of common Source and common drain Amplifier circuits at high frequencies.

UNIT-II : Multistage Amplifiers:

Classification of amplifiers, methods of coupling, cascaded transistor amplifier and its analysis, analysis of two stage RC coupled amplifier, high input resistance transistor amplifier circuits and their analysis- Darlington pair amplifier, Cascode amplifier, Boot-strap emitter follower, Differential amplifier using BJT.

UNIT-III: Feedback Amplifiers

Feedback principle and concept, types of feedback, classification of amplifiers, feedback topologies, Characteristics of negative feedback amplifiers, Generalized analysis of feedback amplifiers, Performance comparison of feedback amplifiers, Method of analysis of feedback amplifiers.

Unit-IV: Oscillators

Oscillator principle, condition for oscillations, types of oscillators, RC-phase shift and Wien bridge oscillators with BJT and FET and their analysis, Generalized analysis of LC Oscillators, Hartley and Colpitt's oscillators using BJT, Frequency and amplitude stability of oscillators.

UNIT-V: Power Amplifiers

Classification of amplifiers (A to H), Class A power Amplifiers, Distortions in Amplifiers, Class B Push- pull amplifiers, Complementary symmetry push pull amplifier, Class AB power amplifier, Class-C power amplifier, Thermal stability and Heat sinks.

Tuned Amplifiers: Introduction, Q-Factor, small signal tuned amplifier, capacitance single tuned amplifier, double tuned amplifiers, staggered tuned amplifiers.

Text Books:

1. Integrated Electronics-J.Millman and C.C.Halkias, Tata McGraw-Hill, 1972.
2. Electronic Devices and Circuits Theory–Robert L.Boylestad and Louis Nashelsky, Pearson/ Prentice Hall, Tenth Edition, 2009.
3. Electronic Devices and Integrated Circuits–B.P.Singh,Rekha,Pearson publications,2006
4. Electronics Devices And Circuits by S. Salivahanan, N. S. Kumar ,Tata McGraw - Hill

References:

1. Electronic Circuit Analysis-B.V.Rao, K.R.Rajeswari, P.C.R.Pantulu, K.B.R.Murthy, PearsonPublications.
2. Electronic Circuit Analysis and Design–Donald A.Neaman, McGraw Hill, 2010.
3. Microelectronic Circuits-Sedra A.S.and K.C.Smith, Oxford University Press, Sixth Edition, 2011.

Online Learning Resources:

- https://nptel.ac.in/courses/117/103/117103063/
- https://nptel.ac.in/courses/108/108/108108122/

Course Outcomes:

COs	Statements	BL
CO1	Student able to Analyze of small signal high frequency transistor amplifier using BJT and FET.	BL4
CO2	Student able to Explain about multistage amplifiers using BJT and FET to determine frequency response and concept of voltage gain and Differential amplifier using BJT.	BL2
CO3	Student able to classify the concept of feed back amplifiers and its analysis.	BL4
CO4	Student able to Explain the concept of different oscillator circuits for various frequencies	BL2
CO5	Student able to Analyze different power amplifiers circuits and with performance comparison and analyze tuned amplifiers circuits and their design	BL4

Course Co-Ordinator's
1. Mr. Ch.V.Bharghav Kumar
2. Mr.P.Srinu

BoS Chairperson

Dr. Jagadeesh Bodapati, Ph.D Professor&Head Department ECE, BVCCE, Rajahmundray Chairperson	Dr. N V Narasimha Sarma, Professor, Department of ECE, NIT Warangal, Subject Expert	Dr. M Ramasubba Reddy, Professor, Dept of applied Mechanics, IIT Chennai, Subject Expert	Dr.A.Mallikarjuna Prasad, Professor, Dept of ECE, UCEK,JNTUK, Kakinada JNTUK Nominee	Dr.M.Venkateswara Rao, ASIC Verification Engineer, ACL Digital, Bangalor Industrial Expert	Mr.Venkatesh Nukella, Assistant Professor(Ph.D), Department of ECE, Aditya Engineering College, Surampalem, Invitee From Alumni

Department of Electronics and Communication Engineering(BVCCE)

II Year II Semester	Analog Communications	L	T	P	C
		3	0	0	3

Course Objectives:
The main objectives of this course are to

- Learn and understand the concept of Modulation and Demodulation of standard AM.
- Learn about the generation and detection of Angle Modulated waves.
- Develop an ability to classify and understand various functional blocks of radio transmitters and receivers.
- Familiarise with basic techniques for generating and demodulating various pulse modulated signals.

UNIT–I: Amplitude Modulation
Introduction to communication system, Need for modulation, Frequency Division Multiplexing, Amplitude Modulation, Time domain and Frequency domain descriptions, Single tone modulation, Power relations in AM waves, Generation of AM waves: Square law Modulator, Switching modulator, Detection of AM Waves: Square law detector, Envelope detector, Related problems.

UNIT–II: DSB & SSB Modulation
Double sideband suppressed carrier modulator: Time domain and frequency domain description, Generation of DSBSC Waves: Balanced Modulator, Ring Modulator, Detection of DSBSC Waves: Coherent detection, Quadrature Null Effect, COSTAS Loop, Squaring Loop.
Single side band suppressed carrier modulator: Time domain and Frequency domain description, Generation of SSBSC Waves: Frequency discrimination method, Phase discrimination method, Demodulation of SSB Waves: Coherent Detection.
Vestigial sideband modulation: Time domain description, Frequency domain description, Generation of VSB Modulated wave, Envelope detection of a VSB Wave pulse Carrier, Comparison of different AM Techniques, Applications of different AM Systems, Related problems.

UNIT–III: Angle Modulation
Introduction, Basic concept of phase modulation, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrowband FM, Wideband FM, Constant Average Power, Transmission bandwidth of FM Wave, Generation of FM Waves: Direct Method, Indirect Method, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Phase locked loop, Comparison of FM &AM, Related problems.

UNIT–IV: Radio Transmitters
Classification of Transmitters, AM Transmitter, Effect of feedback on performance of AM Transmitter, FM Transmitter: Variable reactance type and Phase modulated FM Transmitter, Frequency stability in FM Transmitter.
Radio Receivers: Receiver Types: Tuned radio frequency receiver, Super heterodyne receiver, RF section and Characteristics, Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Amplitude limiting, Comparison of FM & AM Receivers, Communication Receivers, Extension of super heterodyne principle and additional circuits.
UNIT–V: Noise
Review of noise and noise sources, Noise figure, Noise in Analog communication Systems: Noise in DSB& SSB Systems, Noise in AM System and Noise in Angle Modulation Systems, Threshold effect in Angle Modulation System, Pre-emphasis & De-emphasis.

Department of Electronics and Communication Engineering(BVCCE)

Pulse Analog Modulation: Types of Pulse modulation, PAM (Single Polarity, double polarity), PWM: Generation & Detection of PWM, PPM: Generation and Detection of PPM, Time Division Multiplexing, TDM Vs FDM.

Text Books:
1. Communication Systems, Simon Haykin, Michael Moher, Wiley, 5th Edition, 2009.
2. Principles of Communication Systems, HTaub, DL Schilling, Gautam Sahe, TMH, 4th Edition, 2017.
3. Modern Digital and Analog Communication Systems, B.P.Lathi, Zhi Ding, Hari Mohan Gupta, Oxford University Press, 4thEdition, 2017.

Reference Books:
1. Electronics &Communication Systems, George Kennedy, Bernard Davis, SRM Prasanna, TMH, 6th Edition, 2017.
2. Communication Systems, RP Singh, SD Sapre, TMH, 3nd Edition, 2017.
3. Communication Systems(Analog and Digital),Dr. Sanjay Sharma ,Katson Books,7th Reprint Edition, 2018

Online Learning Resources:
- http://nptel.ac.in/courses/117102059/Prof.SurendraPrasad.
- https://ict.iitk.ac.in/wp-content/uploads/EE320A-Principles-Of-Communication- CommunicationSystems-4ed-Haykin.pdf.
- https://www.scribd.com/document/266137872/sanjay-sharma-pdf.
- http://bayanbox.ir/view/9144090083519889086/Book-Modern-Digital-And-AnalogCommunication-Systems-4th-edition-by-Lathi.pdf.
- https://soaneemrana.org/onewebmedia/ELECTRONICS%20COMMUNICATION%20SYSTEM%20BY%20GEORGE%20KENNEDY.pdfCourse Outcomes:

Course Outcomes:

COs	Statements	BL
CO1	Student able to Define the Modulation and Demodulation techniques of standard AM.	BL1
CO2	Student able to Compare different types of Amplitude Modulation and Demodulation techniques.	BL2
CO3	Student able to Analyze the concepts of generation and detection of Angle Modulated signals.	BL4
CO4	Student able to Interpret the Radio Transmitters and Receivers.	BL2
CO5	Student able to Illustrate the noise performance in Analog Modulation techniques and also the concepts of Pulse Analog Modulation and Demodulation techniques	BL2

Course Co-Ordinator's
1.Nalam P U V S N Pavan Kumar
2.Mrs Suneetha Kadiyam

BoS Chairperson

Dr. Jagadeesh Bodapati, Ph.D Professor&Head Department ECE, BVCCE, Rajahmundray Chairperson	Dr. N V Narasimha Sarma, Professor, Department of ECE, NIT Warangal, Subject Expert	Dr. M Ramasubba Reddy, Professor, Dept of applied Mechanics, IIT Chennai, Subject Expert	Dr.A.Mallikarjuna Prasad, Professor, Dept of ECE, UCEK,JNTUK, Kakinada JNTUK Nominee	Dr.M.Venkateswara Rao, ASIC Seinor Verification Engineer, ACL Digital, Bangalor Industrial Expert	Mr.Venkatesh Nukella, Assistant Professor(Ph.D), Department of ECE, Aditya Engineering College, Surampalem, Invitee From Alumni

II Year II Semester	Signals and Systems Lab	L	T	P	C
		0	0	3	1.5

Course Objectives:
- Introduce the basics of MATLAB
- Understand the time domain and frequency domain signals.
- Understand the concept of Fourier, Laplace and Z- Transforms.
- Understand the concept of Correlation and convolution.
- Understand the concept of Frequency Spectrum.

List of Experiments :(Minimum of Ten Experiments has to be performed)
1. Generation of Basic Signals(Analog and Discrete)
   a. Unit step   b. Unit impulse   c.Unit Ramp   d.Sinusoidal   e. Signum
2. Operations on signals
   a. Addition & Subtraction b. Multiplication & Division c. Maximum & minimum
3. Energy and power of signals ,even and odd signals
4. Transformation of the independent variable
5. Shifting(Delay & Advance)
6. Reversing
7. Scaling
8. Convolution & Deconvolution
9. Correlation
10. Fourier Series Representation
11. Fourier Transform and Analysis of Fourier Spectrum
12. Laplace Transforms
13. Z-Transforms

Equipment required: Software:
   i. MATLAB Tools.
   ii. Computer Systems with required specifications

Note: Students supposed to an Experiment beyond the Syllabus / Lab oriented mini-Project / Case Study and submit it for Internal Evaluation.

Course Outcomes:

COs	Statements	BL
CO1	Student able to Understand the basics operation of MATLAB	BL2
CO2	Student able to Analysis the time domain and frequency domain signals	BL4
CO3	Student able to Simplify the concept of Fourier series ,Fourier transforms, Laplace transforms and Z-transforms	BL4
CO4	Student able to Solve cross correlation, autocorrelation of sequence & impulse response,step response of a system	BL3
CO5	Student able to Analyze frequency response of the system	BL4

Course Co-Ordinator's
1. Mr.TLV Ramana
2. Mr. D. Durga Manoj

BoS Chairperson

Dr. Jagadeesh Bodapati, Ph.D Professor&Head Department ECE, BVCCE, Rajahmundray Chairperson	Dr. N V Narasimha Sarma, Professor, Department of ECE, NIT Warangal, Subject Expert	Dr. M Ramasubba Reddy, Professor, Dept of applied Mechanics, IIT Chennai, Subject Expert	Dr.A.Mallikarjuna Prasad, Professor, Dept of ECE, UCEK,JNTUK, Kakinada JNTUK Nominee	Dr.M.Venkateswara Rao, ASIC Senior Verification Engineer, ACL Digital, Bangalor Industrial Expert	Mr.Venkatesh Nukella, Assistant Professor(Ph.D), Department of ECE, Aditya Engineering College, Surampalem, Invitee From Alumni

Department of Electronics and Communication Engineering(BVCCE)

II Year II Semester	Electronic Circuit Analysis Lab	L	T	P	C
		0	0	3	1.5

Course Objectives:
- To prepare students to perform the analysis of any Analog electronics circuit.
- To empower students to understand the design and working of BJT / FET amplifiers, oscillators.
- To evaluate the use of computer based analysis tools to review performance of semiconductor device circuits.
- Model the electronic circuits using tools such as SPICE and Multisim.

Note: The students are required to design the circuit and perform the simulation using Multisim/ Equivalent Industrial Standard Licensed simulation software tool. Further they are required to verify the result using necessary hardware equipment.

List of Experiments :(Minimum of Ten Experiments has to be performed)
1. Determination of Ft of a given transistor.
2. Voltage-Series Feedback Amplifier
3. Current-Shunt Feedback Amplifier
4. RC Phase Shift/Wien Bridge Oscillator
5. Hartley/Colpitt's Oscillator
6. Two Stage RC Coupled Amplifier
7. Darlington Pair Amplifier
8. Boots trapped Emitter Follower
9. Class A Series-fed Power Amplifier
10. Transformer-coupled Class A Power Amplifier
11. Class B Push-Pull Power Amplifier
12. Complementary Symmetry Class B Push-Pull Power Amplifier
13. Class AB Power Amplifier
14. Single Tuned Voltage Amplifier
15. Double Tuned Voltage Amplifier

Equipment required: Software:
i.   Multisim/Equivalent Industrial Standard Licensed simulation software tool.
ii. Computer Systems with required specifications

Hardware Required:
1. Regulated Power supplies
2. Analog/Digital Storage Oscilloscopes
3. Analog/Digital Function Generators
4. Digital Multimeters
5. Decade Résistance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Ammeters(Analog or Digital)
8. Voltmeters(Analog or Digital)
9. Active & Passive Electronic Components

Note: Students supposed to do an Experiment beyond the Syllabus / Lab oriented mini-Project / Case Study and submit it for Internal Evaluation.

Course Outcomes:

COs	Statements	BL
CO1	Student able to Apply the concepts of amplifier analysis to verify their characteristics and measure the important parameters.	BL3
CO2	Student able to Analyze the performance of power amplifiers.	BL4
CO3	Student able to Analyze the frequency response and characteristics of amplifiers.	BL4
CO4	Student able to Simulate and Design of different amplifiers and oscillator circuits.	BL6

Course Co-Ordinator's
1.Mr. Ch.V.Bharghav Kumar
2.Mr.Mr. Kamidi Prasanth

BoS Chairperson

Dr. Jagadeesh Bodapati, Ph.D Professor&Head Department ECE, BVCCE, Rajahmundray Chairperson	Dr. N V Narasimha Sarma, Professor, Department of ECE, NIT Warangal, Subject Expert	Dr. M Ramasubba Reddy, Professor, Dept of applied Mechanics, IIT Chennai, Subject Expert	Dr.A.Mallikarjuna Prasad, Professor, Dept of ECE, UCEK,JNTUK, Kakinada JNTUK Nominee	Dr.M.Venkateswara Rao, ASIC Senior Verification Engineer, ACL Digital, Bangalor Industrial Expert	Mr.Venkatesh Nukella, Assistant Professor(Ph.D), Department of ECE, Aditya Engineering College, Surampalem, Invitee From Alumni

Department of Electronics and Communication Engineering(BVCCE)

II Year II Semester	Softskills	L	T	P	C
		0	1	2	2

Course Objectives:

- To prepare to face global competition for employment and excellence in profession.
- To help the studentsunderstandandbuildinterpersonalandinterpersonalskillsthat will enable them to lead meaningful professional life.

List of Topics:
UNIT–1: INTRODUCTION
Introduction- Emergence of life skills, Definition & Meaning, Importance& need, reasons for skill gap, Analysis--Soft Skills vs Hard skills, Linkage between industry and soft skills, Challenges, Personality Developments. Soft Skills Soft Skills vs English - Improving Techniques.

UNIT–II: Intra-Personal:
Definition-Meaning – Importance-SWOT analysis, Johari windows - Goal Setting- quotient skills - Emotional Intelligence- Attitudinal skills - Right thinking- Problem Solving-Time management, stress management.

UNIT–III: Inter-Personal:
Definition–Meaning–Importance-Communications skills-Team Work, managerial skills-Negotiation skills-Leadership skills, corporate etiquettes.

UNIT–IV: Verbal Skills:
Definition and Meaning-Listening skills, need- types, advantages, Importance-Improving Tips for Listening ,Speaking, need- types ,advantages, Importance- Improving Tips, Reading- Writing Skills, Report, Resume, statement of purpose, need- types, advantages, Importance-Improving Tips .

UNIT–V: Non Verbal Skills&Interview skills
Definition and Meaning – Importance- Facial Expressions- Eye Contact – Proxemics-Haptics -Posture. cross cultural body language ,body language in interview room, appearance and dress code –Kinetics-Para Language -tone.pitch, pause, neutralization of accent, use of appropriate language, Interview skills, interview methods and questions.

Software- K-van solutions

Textbooks:
1. Sherfield, M.Robertatal, Cornerstone Developing SoftSkills,4/e,Pearson Publication, New Delhi, 2014
2. AlkaWadkar,Life Skills for Success,1/e,Sage Publications India Private Limited, 2016.

Reference Books:

1. Sambaiah.M.Technical English,Wiley publishers India.New Delhi.2014.
2. Gangadhar Joshi ,From Campus to Corporate ,SAGETEXT.
3. Alex.K,SoftSkills,3rded.S.Chand Publication,New Delhi,2014.
4. Meenakshi Raman and Sangita Sharma,Technical Communication:Principle and Practice,Oxford University Press, 2009.
5. Shalini Varma,Body Language for Your Success Mantra,4/e,S.Chand Publication, New Delhi, 2014.
6. Stephen Covey,Seven Habits of Highly Effective People,JMD Book,2013.

Online Learning Resources:

- https://onlinecourses.nptel.ac.in/noc20_hs60/preview
- http://www.youtube.com/@softskillsdevelopment6210
- https://youtube.com/playlist?list=PLLy_2iUCG87CQhELCytvXh0E_y-bOO1_q&si=Fs05Xh8ZrOPsR8F4
- https://www.coursera.org/learn/people-soft-skills-assessment?language=English
- https://www.edx.org/learn/soft-skills

Course Outcomes:

COs	(Statements) Students will be able to	Blooms Level
CO1	Assimilate and understand the meaning and importance of soft skills and Learn how to develop them.	BL1
CO2	Understand the significance of soft skills in the working environment for Professional excellence.	BL2
CO3	Prepare to undergo the placement process with confidence and clarity.	BL3
CO4	Ready to face any situation in life and equip themselves to handle them effectively.	BL6
CO5	Understand and learn the importance of etiquette in both professional And personal life	BL2

Course Co-Ordinator's   **BoS Chairperson**
1. Mr V. Arun kumar
2. Miss. P.Jyothi

Dr. K. Veerabbayi	Dr. B. Aseesh Babu	Dr. Demudu Naidu Jureddi	Dr.K.Sree Ramesh
Chairperson	Subject Expert	Subject Expert	JNTUK Nominee

Department of Electronics and Communication Engineering(BVCCE)

		L	T	P	C
CC:23ES4L05					
II Year II Semester	Design Thinking & Innovation	1	0	2	2

Course Objectives:
The objectives of the course are to
- Bring awareness on innovative design and new product development.
- Explain the basics of design thinking.
- Familiarize the role of reverse engineering in product development.
- Train how to identify the needs of society and convert in to demand.
- Introduce product planning and product development process.

UNIT–I : Introduction to Design Thinking
Introduction to elements and principles of Design, basics of design-dot, line, shape, form as fundamental design components. Principles of design. Introduction to design thinking, history of Design Thinking, New materials in Industry.

UNIT–II: Design Thinking Process
Design thinking process (empathize, analyze, idea & prototype), implementing the process in driving inventions, design thinking in social innovations. Tools of design thinking - person, costumer, journey map, brain storming, product development.
Activity: Every student presents their idea in three minutes, Every student can present design process in the form of flow diagram or flow chart etc. Every student should explain about product development.

UNIT–III: Innovation
Art of innovation, Difference between innovation and creativity, role of creativity and innovation in organizations. Creativity to Innovation. Teams for innovation, measuring the impact and value of creativity.
Activity: Debate on innovation and creativity, Flow and planning from idea to innovation, Debate on value-based innovation.

UNIT–IV: Product Design
Problem formation, introduction to product design, Product strategies, Product value, Product planning, product specifications .Innovation towards product design Cases studies.
Activity: Importance of modeling, how to set specifications, Explaining their own product design.

UNIT–V: Design Thinking in Business Processes
Design Thinking applied in Business & Strategic Innovation, Design Thinking principles that redefine business–Business challenges: Growth, Predictability, Change, Maintaining Relevance, Extremecompetition, Standardization. Design thinking to meet corporateneeds .Design thinking for Startups .Defining and testing Business Models and Business Cases. Developing &testing prototypes.

Activity: How to market our own product, about maintenance, Reliability and plan for startup.

Textbooks:
1. Tim Brown, Change by design,1/e,Harper Bollins,2009.
2. Idris Mootee, Design Thinking for Strategic Innovation, 1/e, Adams Media,2014.

Reference Books:
2. David Lee, Design Thinking in the Classroom, Ulysses press, 2018.
3. Shrrutin N Shetty, Design the Future,1/e, Norton Press,2018.
4. Williamlid well, Kritinaholden,& Jillbutter, Universal principles of design,2/e, Rockport Publishers,2010.

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5. Chesbrough.H, Theeraofopeninnovation, 2003.

Online Learning Resources:
- https://nptel.ac.in/courses/110/106/110106124/
- https://nptel.ac.in/courses/109/104/109104109/
- https://swayam.gov.in/nd1_noc19_mg60/preview
- https://onlinecourses.nptel.ac.in/noc22_de16/preview

Course Outcomes:

COs	Statements	BL
CO1	Student able to Define the concepts related to design thinking.	BL1
CO2	Student able to Explain the fundamentals of Design Thinking and innovation.	BL2
CO3	Student able to Apply the design thinking techniques for solving problems inVarious sectors.	BL3
CO4	Student able to Analyze to work in a multi-disciplinary environment.	BL4
CO5	Student able to Evaluate the value of creativity.	BL5

Course Co-Ordinator's
1. Mr.S.A.VaraPrasad
2. Mr. D. Durga Manoj

D. Durga Manoj

BoS Chairperson

Dr. Jagadeesh Bodapati, Ph.D Professor&Head Department ECE, BVCCE, Rajahmundray Chairperson	Dr. N V Narasimha Sarma, Professor, Department of ECE, NIT Warangal, Subject Expert	Dr. M Ramasubba Reddy, Professor, Dept of applied Mechanics, IIT Chennai, Subject Expert	Dr.A.Mallikarjuna Prasad, Professor, Dept of ECE, UCEK,JNTUK, Kakinada JNTUK Nominee	Dr.M.Venkateswara Rao, ASIC Scnior Verification Engineer, ACL Digital, Bangalor Industrial Expert	Mr.Venkatesh Nukella, Assistant Professor(Ph.D), Department of ECE, Aditya Engineering College, Surampalem, Invitee From Alumni