ADIKAVI NANNAYA UNIVERSITY:: RAJAMAHENDRAVARAM
UNIVRSITY 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

IIND B TECH (ECE) *STRUCTURE &SYALLBUS*

II B.Tech II Semester ECE w.e.f 2017-18

Sub Code	Subject	Hrs/Week		Max Marks		Total Marks	Credits
		Theory	Lab	Internal	External		
BTECE401	ELECTROMAGNETIC WAVES AND TRANSMISSION LINES	4	--	25	75	100	4
BTECE402	PULSE AND DIGITAL CIRCUITS	4	--	25	75	100	4
BTECE403	ELECTRICAL TECHNOLOGY	4	--	25	75	100	4
BTECE404	ANALOG COMMUNICATIONS	4	--	25	75	100	4
BTECE405	CONTROL SYSTEMS	4	--	25	75	100	4
BTECE406	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	4	--	25	75	100	4
BTECE407	PULSE AND DIGITAL CIRCUITS LAB	--	3	50	50	100	2
BTECE408	NETWORK ANALYSIS & ET LAB	--	3	50	50	100	2
Total		**24**	**06**	**250**	**550**	**800**	**28**

BTECE401:ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

Theory : 4 Hrs/week   **Credits : 4**
Int Marks : 25   **Ext Marks : 75**

UNIT –I

Electrostatics-I: 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, Illustrative Problems.

UNIT – II

Electrostatics-II: 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 – III

EM Wave Characteristics - I: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H. Sinusoidal Variations. Wave Propagation in Lossless and Conducting Media. Conductors & Dielectrics –Characterization, Wave Propagation in Good Conductors and Good Dielectrics Polarization.

UNIT – IV

Transmission Lines – I : Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion– Condition for Distortionlessness and Minimum Attenuation, Loading - Types of Loading.

TEXT BOOKS:

1. Elements of Electromagnetic – Matthew N.O. Sadiku, Oxford Univ. Press, 4th ed., 2008.

REFERENCE BOOKS:

1. Electromagnetic Waves and Radiating Systems–E.C. Jordan and K.G. Balmain, PHI, 2nd edition 2000.

BTECE402:PULSE AND DIGITAL CIRCUITS

Theory: 4 Hrs/week   **Credits: 4**
Int Marks: 25   **Ext Marks: 75**

UNIT-I

LINEAR WAVESHAPING: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and exponential inputs. RC network as differentiator and integrator; Attenuators , its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit.

UNIT-II

NON-LINEAR WAVE SHAPING : Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper; Clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clampers.

UNIT-III

MULTIVIBRATORS: Bistable Multivibrator: Transistor as a switch, Switching times of a transistor, Analysis And Design of Fixed Bias, Self Bias Bistable Multi Vibrator, Commutating Capacitors, Triggering of Binary Circuits, Emitter Coupled Bistable Multivibrator (Schmitt Trigger) and its applications.
Monostable Multivibrator: Analysis and Design of Collector Coupled Monostable Multi vibrator, Triggering of Monostable Multivibrator, Applications of Monostable Multivibrator.
Astable Multivibrator: Analysis and Design of Collector Coupled Astable Multivibrator, Application of Astable Multivibrator as a Voltage to Frequency Converter.

UNIT-IV

VOLTAGE TIME BASE GENERATORS: General features of a time base signal, Methods of generating time base waveform Exponential Sweep Circuits, Negative Resistance Switches, basic principles in Miller and Bootstrap time base generators, Transistor Miller time base generator, Transistor Bootstrap time base generator.
LOGIC GATES: Realization of gates using diodes and Transistors, RTL, DTL.

TEXT BOOKS:
1. Pulse Digital and Switching Waveforms, J. Millman and H. Taub, McGraw-Hill, 2nd Edition 1991.
2. Pulse switching and digital circuits – David A.Bell,PHI ,5th Edn., oxford university press.
3. Mothiki S. Prakash Rao, Pulse Digital & Switching Waveforms, 2nd Edition, TMH.

REFERENCE BOOKS:
1. Pulse and Digital Circuits, K.Venkat Rao, Pearson Education India, 2nd Edition, 2010.
2. Pulse and Digital Circuits, A. Anand Kumar, PHI, second edition, 2005.

BTECE403: ELECTRICAL TECHNOLOGY

Theory : 4 Hrs/week   **Credits** : 4
Int_Marks : 25   **Ext_Mark : 75**

UNIT I

TRANSIENT ANALYSIS: Transient Response of RL, RC and RLC Circuits for DC excitations, Initial Conditions, Solution using Differential Equations approach and Laplace Transform Method.

UNIT II

Two Port Networks: Impedance Parameters, Admittance Parameters, Hybrid Parameters, Transmission (ABCD) Parameters, Conversion of one Parameter to another, Conditions for Reciprocity and Symmetry, Interconnection of Two Port networks in Series, Parallel and Cascaded configurations, Image Parameters, Illustrative problems.

UNIT III

DC Machines: DC Generators: Principles of Operation of DC Generator, construction, EMF equation, Types of Generators, Magnetization, Internal and external Characteristics of DC Generators. DC Motors**:** DC Motors, Types of Dc Motors, Characteristics of Dc Motors, Losses and Efficiency, Swinburne's Test, Speed Control of Dc Shunt Motor- Flux and Armature Voltage control methods.

UNIT IV

Transformers and AC Machines: Transformers and Their Performance: Principle of Operation of Single Phase transformer, Types, Constructional Features, Phasor Diagram on No Load and Load, Equivalent Circuit, Losses, Efficiency and Regulation of Transformer, OC and SC Tests, Predetermination of Efficiency and Regulation, Simple Problems.

AC Machines - Three Phase Induction Motor: Principle of operation of three phase induction motors- Slip ring and Squirrel cage motors –Slip - Torque characteristics.

Alternators: Principle of operation –Types - EMF Equation- Predetermination of regulation by Synchronous Impedance Method- OC and SC tests

TEXT BOOKS:
1. Network analysis and Synthesis- C L Wadhwa, New Age International Publishers.
2. Circuit Theory by Chakrabarti, DhanpatRai and Co.
3. Principles of Electrical Engineering- A.Sudhakar, ShyammohanS.Palli, TMH Publications.
4. Introduction to Electrical Engineering – M.S.Naidu and S. Kamakshaiah, TMH Publications.

REFERENCE BOOKS:
1. N C Jagan C Lakhminaraya, ―Network Analysis, BS Publications 2nd Edition, 2011.
2. B.L... Thereja and Thereja "A text book of Electrical Technology"-Vol-I, S.Chand&Co.Ltd.
3. P S Bimbra, ―Electrical Machines, Khanna Publishers, New Delhi,2004.

BTECE404: ANALOG COMMUNICATIONS

Theory : 4 Hrs/week	Credits : 4
Int_Marks : 25	Ext_Marks : 75

UNIT – I

Amplitude Modulation: Introduction to communication system, Need for modulation, Time domain and frequency domain description, 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, DSBSC and SSB generation and detection methods Balanced Modulators, Ring Modulator, Coherent detection, COSTAS Loop

UNIT – II

Angle Modulation: : Introduction to Angle modulation, Relation between frequency Modulation and phase modulation, Single tone frequency modulation, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Waves, Pre-emphasis & De-emphasis Direct FM, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Comparison of FM & AM.

UNIT – III

Sampling Theory and Pulse Modulation: Sampling theorem – Nyquist rate – Aliasing effect – Sampling of Band pass signals –Time Division Multiplexing- Frequency Division Multiplexing. , Types of Pulse modulation, PAM, PWM and PPM – Generation and detection – comparison of Modulation methods.

UNIT – IV

Noise: Types of Noise**,** Noise in Analog communication System, Noise in DSB& SSB System Noise in AM System, Noise in Angle Modulation System
Transmitters & Receivers: Classification of Transmitters, AM Transmitters-High level and low level, FM Transmitter –Variable reactance type and phase modulated FM Transmitter, frequency stability in FM Transmitter. Receiver Types -Tuned radio frequency receiver, Superhetrodyne receiver, AGC, FM Receiver

TEXT BOOKS:
1. Principles of Communication Systems – H Taub & D. Schilling, Gautam Sahe, TMH, 2007 3rd Edition.
2. Communication Systems – B.P. Lathi, BS Publication, 2006.
3. Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.

REFERENCE BOOKS:
1. Electronics & Communication System – George Kennedy and Bernard Davis, TMH 2004.
2. Fundamentals of Communication Systems - John G. Proakis, Masond, Salehi PEA, 2006.
3.

BTECE405: CONTROL SYSTEMS

Theory : 4 Hrs/week   **Credits** : 4

Int Marks : 25   **Ext Marks** : 75

UNIT I

Introduction: Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification 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 Function Representation: Transfer Function of DC Servo motor - AC Servomotor- 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.

Time Response Analysis: Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems.

UNIT III

Stability Analysis in S - Domain: The concept of stability - Routh stability criterion – qualitative stability and conditional stability – limitations of Routh's stability

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. Basics of PID Controllers.

UNIT IV

Frequency Response Analysis: Introduction, Frequency domain specifications-Bode diagrams- Determination of Frequency domain specifications and transfer function from the Bode Diagram- Phase margin and Gain margin-Stability Analysis from Bode Plots.

TEXT BOOKS:
1. Control Systems Theory and Applications, S.K Bhattacharya, Pearson
2. Control Systems, N.C. Jagan, BS Publications

REFERENCE BOOKS:
1. Control Systems, A. Anand Kumar, PHI
2. Control Systems Engineering, S. Palani, Tata – McGraw Hill
3. Control Systems, Dhanesh N.Manik, Cengage Learning
4. "I. J. Nagrath and M. Gopal", "Control Systems Engineering", New Age International (P) Limited, Publishers, 5th edition, 2009
5. "N. K. Sinha", "Control Systems", New Age International (P) Limited Publishers, 3rdEdition, 1998.

BTECE406: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Theory   : 4 Hrs/week   **Credits : 4**
Int Marks : 25   **Ext Marks :75**

UNIT I
Introduction to Managerial Economics
Definition, Nature and scope Managerial economics – Demand analysis: Demand determinants, Law of Demand and its exceptions. Elasticity of Demand : Definition , types, Measurement and significance of elasticity of Demand .Demand forecasting ,factors governing demand forecasting, methods of demand forecasting(survey methods, statistical methods, expert opinion method , test marketing , controlled experiments, judgemental approach to demand forecasting).

UNIT II
Theory of Production and Cost Analysis
Production function –Isoquants and Isocosts, MRTS , Least Cost combination of inputs, Cobb-Douglas Production function, Laws of returns, Internal and external economies of scale. Cost Analysis: cost concepts, opportunity cost, fixed Vs Variable costs, explicit costs Vs Implicit cost, Out of pocket costs Vs Imputed costs. Break-even Analysis (BEA) – Determination of breakeven point (simple problems)- Managerial significance and limitations of BEA.

UNIT III
Market Structures & Pricing Strategies: Market structures: Types of competition, Features of Perfect competition. Monopoly and monopolistic completion. Price- Output determination in case of perfect competition and monopoly. Objectives and policies of pricing – Methods of pricing.
Business and New Economic Environment: Characteristics of business, features and evaluation of sole proprietorship, partnership, Joint stock company, public enterprises and their types, changingbusiness environment in post – liberalization scenario.

UNIT IV
Capital and Capital Budgeting: Capital and its significance, types of capital, estimation of fixed and working capital requirements, methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals, methods of capital budgeting.
Financial accounting: Double entry book keeping, journal, ledger, trial balance- final accounts.
Financial Analysis Through Ratios: Computation, Analysis and interpretation of liquidity ratios, Activity ratios, capital structure ratios and profitability ratios.

TEXT BOOKS:
1. Aryasri; Managerial economics and financial analysis, TMH, 2007.
2. Varshney & Maheswari: Managerial economics, sultan Chand, 2007.

REFERENCE BOOKS:
1. Ambrish Gupta, Finacial accounting foe management, Pearson education, New delhi,2007.
2. Shim &siegel :financial accounting (Schaum's Outlines), THM,2007.
3. Chary :Production and operations Management,THM,2007.
4. S.N.Maheswari & S.K.Maheshwari,financial accounting, Vikas ,2007.
5. Dwivedi : Managerial economics, 6th Ed., Vikas , 2007.

BTECE407:PULSE & DIGITAL CIRCUITS LAB

Lab	**: 3 Hrs/week**	**Credits**	**: 2**
Int Marks	**: 50**	**Ext Marks**	**: 50**

LIST OF EXPERIMENTS:

1. Linear wave shaping.

2. Non Linear wave shaping – Clippers.

3. Non Linear wave shaping – Clampers.

4. Transistor as a switch.

5. Study of Logic Gates & Some applications.

6. Study of Flip-Flops & some applications.

7. Sampling Gates.

8. Astable Multivibrator.

9. Monostable Multivibrator.

10. Bitable Multivibrator.

11. Schmitt Trigger.

12. UJT Relaxation Oscillator.

13. Bootstrap sweep circuit.
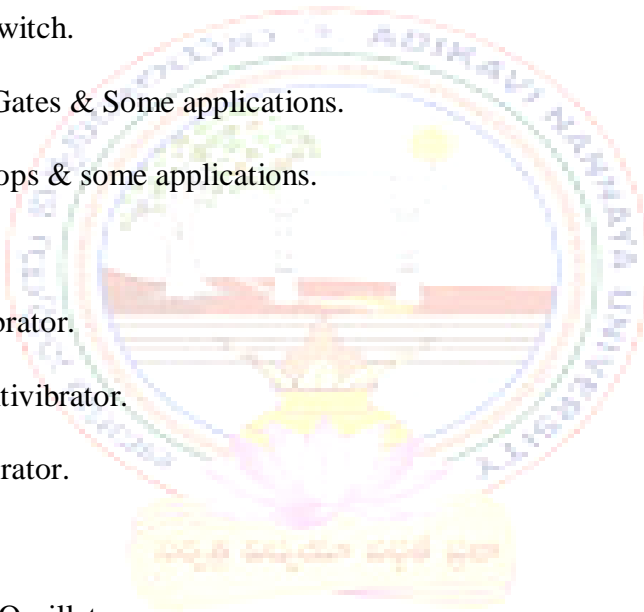
BTECE408: NETWORK ANALYSIS & ET LAB

Lab   : 3 Hrs/week   Credits   : 2
Int Marks : 50   Ext Marks : 50

LIST OF EXPERIMENTS:

PART- A

1. Verification of KVL and KCL.

2. Series and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Qfactor determination for RLC network.

3. Time response of first order RC/RL network for periodic non-sinusoidal inputs time-constant and steady state error determination.

4. Two port network parameters –Z and Y-parameters

5. Two port network parameters – ABCD and h-parameters

6. Verification of Superposition and Reciprocity theorems.

7. Verification of maximum power transfer theorem. Verification on DC and AC Excitation with Resistive and Reactive loads

8. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by Direct test.

PART- B

1. Magnetization characteristics of D.C Shunt generator, Determination of critical field résistance.

2. Swinburne's Test on Dc shunt machine. (Predetermination of efficiency of a given

Dc Shunt machine working as motor and generator)

3. Brake test on DC shunt motor. Determination of Performance Characteristics

4. OC and SC tests on Single-phase transformer (Predetermination of Efficiency and

Regulation at given power factors and determination of equivalent circuit)

5. Load Test on single Phase Transformer.

6. Speed Control of DC shunt Motor – flux and armature voltage control methods.