MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

B.Tech. I Semester (Electronics Engineering/ Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
140111/200111	ESC	Electronics Workshop	-	-	-	60	40	100	-	-	2	1

Subject Name: Electronic Workshop
Subject Code: 140111/200111

Course Objectives:

Students will be able to learn the practical aspects of the basic electronic components, instruments and PCB designing.

List of Experiment

1. Study of basic electronic components
2. Study of bread board, power supply, digital storage oscilloscope and multimeter.
3. Identification of Polarity, and cut in voltage of various electronics components.
4. Phase shift measurement using Lissajous Pattern.
5. Study of basic steps involved in PCB designing.
6. Fabrication of small electronic circuits.

Course Outcome:

After completing the course, students will be able to

CO1. Evaluate the parameters of basic electronic components.
CO2. Calculate the phase shift between two waveforms.
CO3. Fabricate small electronics circuits.

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(11)

B.Tech. II Semester (Electronics Engineering/ Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
140211/200211	DC	Electronics Devices	60	20	20	60	40	200	2	1	2	4

Electronics Devices (140211/200211)

Course Objective: To understand construction, principal and operation of different semiconductor devices.

Unit I: Fundamental of Electronic Devices: Elemental & Compound Semiconductor Materials , Bonding Forces and Energy Bands in Intrinsic and Extrinsic Silicon, Charge Carrier in Semiconductors , Carrier Concentration, Extrinsic Semiconductor, Hall Effect, Mechanism of Current Flow, Drift Current, Diffusion Current, Einstein Relation, Continuity Equation.

Unit II: Semiconductors Diodes: P-N Junction properties, Diode Characteristics, Equilibrium condition, biased junction, Steady state condition, P-N Junction breakdown mechanism, Capacitance of junction barrier, Diode circuit parameters, Basic circuits of Rectifier, Clippers and Clampers.

Unit III: Bipolar Junction Transistors: Construction, basic operation, current components and equations, CB, CE and CC configuration, input and output characteristics, Early effect, Region of operations: active, cut-off and saturation region.

Unit IV: Field effect transistors: Construction and characteristics of JFET, working principle of JFET.MOSFET construction and characteristics, MOSFET enhancement and depletion mode.

Unit V: Power Electronics Devices: Basic principle and working of SCR, IGBT, Uni-junction Transistor (UJT) and Thyristors. UJT: Principle of operation, characteristics.

Text Books:

1. Electronics Devices and Circuits: Boylested & Nashelsky, 11th Edition, Pearson Education India
2. Electronic devices and circuits: S. Salivahanan, 2nd Edition, Tata McGraw-Hill Education, 2011.
3. Microelectronic Circuits: Theory and Application: Sedra & Smith, 7th Edition, Oxford University Press.

Reference Books:

1. Micro Electronics: Millman, & Grabel, 2nd Edition, McGraw Hill Education
2. Integrated Electronics: Millman &Halkias, McGraw Hill Education.

Course Outcomes

After the completion of this course students will be able to:

- **CO1.** **Analyze** the properties of semiconductor materials.
- **CO2.** **Understand** construction and working of different diodes.
- **CO3.** **Analyze** the operation of Bi-polar junction transistors.
- **CO4.** **Examine** the working of Field Effect Transistors.
- **CO5.** **Analyze** the working of power electronics devices.

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B.Tech. II Semester (Electronics Engineering/ Electronics and Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot		Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark		L	T	P	
140212/200212	DC	Engineering materials	60	20	20	-	-	100	3	1	-	4

Engineering Materials (140212/200212)

Course Objective: To introduce the student with different materials and their characteristics used in manufacturing various electrical and electronics equipment.

Unit 1 Conducting materials: Classification of Engineering Materials, Crystal Structure of The Material, Crystal System, Unit Cells and Space Lattices and Defects. Conducting Material- Properties of Conductors, Characteristics of Good Conductor Material, Commonly used Conducting Materials, Conducting Materials for Overhead Lines, Types of Conductor and Applications.

Unit 2 Dielectric materials: Dielectric Strength, Factors affecting Dielectric Strength, Dielectric Loss, Dissipation Factor, Factors affecting Dielectric Loss, Permittivity & Polarization, Conduction through Dielectric. Application of Dielectric. Different Types of Capacitors and Materials used for them. Piezoelectricity & Ferro Electricity

Unit 3 Semi Conducting Material: Introduction - Semi-conductors and their properties, Different Semiconducting materials (Silicon and Germanium) used in manufacture of various Semiconductor devices (i.e p-type and n-type semiconductors), Materials used for electronic components like Resistors, Capacitors, Diodes, Transistors and Inductors etc.

Unit 4 Insulating Material: Plastics- Definition and classification, Thermosetting Materials, Thermoplastic Materials; Natural Insulating materials, properties and their applications; Gaseous Materials – Ceramics-properties and applications.

Unit 5 Magnetic Material: Introduction and classification - Ferromagnetic Materials, Permeability, BH curve, Magnetic Saturation, Hysteresis loop (including) coercive force and Residual Magnetism, Concept of Eddy Current and Hysteresis loss, Curie temperature, Magnetostriction effect, Soft Magnetic Materials, Hard Magnetic materials , Hall effect and its applications.

Text Books:

1. SK Bhattacharya, "Electrical and Electronic Engineering Materials"1st edition, Khanna Publishers, New Delhi, 2006.
2. A.J. Dekker "Electrical Engineering Materials", Reprint 1st edition, PHI, 2006.

Reference Books:

1. Sahdev, "Electrical Engineering Materials", Unique International Publications.
2. C. S. Indulkar & S. Thiruvengadam, "Electrical Engineering Materials", Reprint 1st edition, 2013, S. Chand & Com. Ltd, New Delhi -55
3. S.P. Seth, P.V. Gupta "A course in Electrical Engineering Materials", 4th Edition, 2017, Dhanpat Rai & Sons.

Course Outcome:

After successful completion of the course, student will be able to:

CO 1. Classify engineering materials.
CO 2. Analyze the characteristics of dielectric materials.
CO 3. Analyze the characteristics of semi-conducting materials.
CO 4. Identify insulating materials for special purposes.
CO 5. Classify magnetic materials with reference to their properties.

B.Tech. III Semester (Electronics Engineering/Electronics & Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini project		L	T	P	
140311/ 200311	DC	Electronic circuit Design	60	20	20	60	20	20	200	2	1	2	4

Electronic Circuit Design (140311/200311)

Course Objective: To understand different semiconductor circuits and grab the way to design circuits and perform measurements of circuit parameters.

Unit I: Diode Circuits: Review of P-N Junction Diodes, Power supply parameters, SMPS, Zener and Avalanche Breakdown, Zener voltage regulator, series pass regulator (with feedback) and shunt voltage regulators, Short circuit protection.

Unit II: Introduction to BJT Biasing and Stability: Review of BJTs, Transistor biasing and bias stabilization, the operating point, stability factor, analysis of fixed base bias, Voltage divider bias, collector to base bias, Emitter resistance bias circuit and Bias compensation techniques.

Unit III: BJT as an Amplifier:Low frequency BJT amplifiers, equivalent circuit of BJT using h parameter for CB, CE, CC configurations, calculation of transistor parameter for CB, CE, CC using h parameters. High frequency BJT amplifier: Hybrid-pi (π) common emitter transistor model, hybrid – π conductance and capacitance, gain-bandwidth product.

Unit IV: Feedback amplifiers: Introduction to Feedback Amplifiers & their design parameters, comparison of different feedback amplifier configuration viz (gain, input impedance, output impedance, current gain, voltage gain), cascading of BJT amplifier, Darlington Pair.

Unit V: Oscillators and Tuned Amplifiers: Barkhausen criterion, Sinusoidal oscillators, L-C (Hartley-Colpitts) oscillators, RC phase shift, resonant oscillator, Wien Bridge and crystal oscillators, Clapp oscillator, Tuned amplifier design using BJTs.

Text Books:

1. Microelectronic Circuits:Theory and Application: Sedra& Smith,**7th Edition,** Oxford University Press.
2. Electronics Devices and Circuits: Boylested&Nashelsky,**11th Edition,** Pearson Education India

Reference Books:

3. Electrical Engineering material: A.J Dekker, 1st Edition, Prentice Hall of India.
4. Micro Electronics: Millman, &Grabel,**2nd Edition,** McGraw Hill Education
5. Integrated Electronics: Millman&Halkias,McGraw Hill Education.

Course Outcomes

After the completion of this course students will be able to:

CO 1. **Design** different diode circuits.
CO 2. **Design** the biasing circuits for BJTs.
CO 3. **Examine** the working of BJT amplifiers.
CO 4. **Analyze** the different parameters of feedback amplifiers.
CO 5. **Design** the Oscillator and Tuned amplifier circuits.

B.Tech. III Semester (Electronics Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini project		L	T	P	
140312/ 200312	DC	Digital Circuits & Systems	60	20	20	60	20	20	200	3	-	2	4

Digital Circuits & Systems (140312/200312)

Course Objective: To understand the concept of digital systems, design&analyze the combinational and sequential logic circuits.

Unit I: Boolean algebra and switching functions: Minimization of Boolean functions, Canonical & standard form, concept of prime implicant etc. Karnaugh's map method, Quine-McCluskey's method, Universal gates, NAND/NOR realization of Boolean functions.

Unit II: Combinational Logic circuits: Half adder, Half subtractor, Full adder, Full subtratctor circuits. Serial and parallel adder, BCD adders, look-ahead carry generator, Code Converters, Decoders, Encoders, Multiplexers & demultiplexers.

Unit III: Sequential Circuits: Latches, Flip-flops - SR, JK, D, T, and Master-Slave,Race around condition Characteristic table and equation, Excitation table, Edge triggering, Level Triggering, Realization of one flip flop using other flip flops.

Unit IV: Registers and Counters: Asynchronous Ripple or serial counter, Asynchronous Up/Down counter, Synchronous counters, Synchronous Up/Downcounters, Design of Synchronous counters: State diagram, State table, State minimization, State assignment, Excitation table and Maps Circuit, Implementation: Modulo-n-counter, Registers:Shift registers, Universal shift registers, Shift register counters, Ring counter, Sequence generators, Johnson Counter.

Unit V: Logic Families: Diode and transistor as a switch, FET as a switch, specifications for Logic Families, RTL, DCTL, IIL, DTL, all types of TTL circuits, ECL, HTL and PMOS, NMOS & CMOS logic, Comparison of various logic families.

Text Books:

1. Digital Design: M. Mano,4th Edition**,** Prentice Hall of India.
2. Logic & Computer Design Fundamental: M.Mano, 5th Edition, Pearson Education India.
3. Digital Circuits and Design: S. Salivahanan,5th Edition**,** Oxford University Press.

Reference Books:

1. Digital Electronics: W.H. Gothman, Prentice Hall of India.
2. Digital System Principles & Applications: R.J. Tocci,11th Edition**,** Pearson Education India.
3. Pulse, Digital & Switching Waveforms: Millman&Taub,McGraw Hill Education.

Course Outcomes

After the completion of this course students will be able to:

CO1. Implement the Boolean expression using basic and universal logic gates.
CO2. Design different combinational logic circuits
CO3. Design various latches and flip-flops
CO4. Design various shift registers and counters using flip-flops.
CO5. Analyze different types of logic families, semiconductor memories, & multivibrators.

B.Tech. III Semester (Electronics Engineering)

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini project		L	T	P	
140313/ 200313	DC	Network Theory	60	20	20	60	20	20	200	2	1	2	4

Network Theory (140313/ 200313)

Courseobjective: Tounderstandbasic electriccircuits,studyofnetworktheorems,transientanalysis, graphtheory, analysisoftwoportnetworks.

Unit-I Introduction – Basics of Circuit Elements**,** Characterization of Resistors, Capacitors & Inductors in Termsof their linearity & time dependence features, Characteristics of Independent & Dependent Sources, KCL& KVL for circuits with dependent & independent sources, Dot convention for coupled inductor and their characteristics, co-efficientofcoupling.

Unit-II Network theorems- Superposition, Thevenin, Norton, Millman, Reciprocity and MaximumPower Transfer theorems, Network topology, concept of network graph,Tree, Twigs andlink,Incidentmatrix, CutsetandTiesetmatrices.

Unit-III Transient analysis- Transients in RL, RC and RLC circuits, initial conditions, time constants,Steady state analysis, Node and mesh analysisofRL, RCandRLC networkswithsinusoidalsources.

Unit-IVLaplace Transform & Passive Filters: The Laplace transform, Properties of Laplacetransform, solution of differential equation using Laplace Transform, Initial and final value theorem.Waveformsynthesis&LaplaceTransform ofvariouswaveformfunction, Low pass, high pass, band pass and band elimination filters,

Unit-V Two Port Network: Concept of Ports, Calculation ofnetwork functions for one port and two port, Two portparameters– Z,Y,hybridand chainParameters,Relationshipbetweentwoportnetworkparameters, T and π networks, Characteristics impedance & propagation constant.

TextBooks:

1. NetworkAnalysis:M.E.VanValkenberg,3rdEdition,PrenticeHallofIndia.
2. NetworkandSystems:D.RoyChaudhary,**2nd Edition,**NewAcademicScienceLtd.

ReferenceBooks:

3. IntroductiontoModernNetworkSynthesis:M.E.VanValkenberg,PrenticeHallofIndia.
4. NetworkAnalysis&Synthesis:F.Kuo,2ndEdition,Wiley&Sons.
5. NetworkAnalysis&Synthesis:RavishRSingh,1stEdition,McGrawHillEducation.

CourseOutcomes

Afterthecompletionof thiscoursestudents willbeableto:

- **CO1. Analyze**thecircuits usingKirchoff'slaws.
- **CO2. Apply** Networktheorems and concept of graph theory for simplification of circuits. .
- **CO3. Evaluate**transientresponseandsteadystateresponse.
- **CO4. Apply**theLaplacetransformtolinearcircuitsandsystems.
- **CO5. Determine**ABCD,Z,Yandhparameterof anelectricalcircuits.

Subject Code	Category Code	Subject Name	Theory Slot			Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini project		L	T	P	
140314/ 200314	DC	Analog Communication	60	20	20	-	-	-	100	3	-	-	3

Analog Communication (140314/ 200314)

Course objective: To understand the concept of modulation, various types of modulation, application, standards, analysis of modulation and demodulation process, probability theory and probability function, and concept of noise.

Unit I: Spectral Analysis: Introduction to signals and classifications, Introduction to Fourier series, Introduction to Fourier Transforms and its properties, Fourier transform of important functions, Autocorrelation, Cross correlation and their properties.

Unit II: Amplitude Modulation: Needs of modulation, Amplitude modulation, SSB, DSB,VSB suppressed carrier modulation, Modulation techniques their generation, detection and spectral analysis, square law modulators, switching modulator, envelope and square law detector, balanced modulator, Superhetrodyne receiver, Power calculation for AM, DSB-SC & SSB-SC, FDM.

Unit II Angle Modulation: Relationship between Frequency and phase modulation, frequency and phase deviation, types of FM, comparison between NBFM & AM signal., Carson's rule, spectrum of FM signal, comparison of narrow band and wide band FM, generation and detection of FM. Pre-emphasis and de-emphasis, capture effect.

Unit IV Probability, and random variables: Random variable, sample space and events, probability and its properties, distribution function, discrete random variable and probability mass function, continuous random variable and probability density function, cumulative distribution function, probability density function, statistical average, variance, moment, Distributions: Binomial, Poisson, Gaussian and Rayleigh probability density function.

Unit V Noise Analysis: Various sources of noise, types of noise with their characteristics, Mathematical representation of noise figure, Noise bandwidth, Noise temperature and noise figure of amplifiers in cascades, Figure of merit of modulation techniques, comparison of modulation scheme for noise.

Text Books:

1. Communication System: Simon Haykins, Wiley & Sons.
2. Communication Systems - B. P. Lathi, BSP Publication

Reference Books:

1. Electronic Communication System: Kennedy-Devis, Tata McGraw-Hill Education.
2. Modern Digital & Analog Communication System: B.P. Lathi ,Oxford University Press.
3. Principles of Communication System: Taub and Schilling McGraw-Hill Education.

Course Outcomes After the completion of this course students will be able to:

CO1. Analyze the frequency domain representation of various signals.
CO2. Describe amplitude modulation, their generation & detection methods.
CO3. Explain the generation and detection techniques for angle modulated signal.
CO4. Evaluate the statistical parameters for general PDF/CDF.
CO5. Evaluate the effects of noise on modulation techniques

ANNEXURE XIII

B.Tech IV Sem (Electronics Engineering/ Electronics & Telecommunication Engineering)

Code	Category Code	Subject Name	Theory Slot				Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Proficiency	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini proj		L	T	P	
140416/ 200416	DC	Digital Communication	50	10	20	20	60	20	20	200	2	1	2	4

Digital Communication (140416/200416)

Course Objectives: The main objective of this course is to understand the basic concepts of digital modulations and digital transmission techniques.

Unit I Sampling: Sampling theorem for Low pass signal, Ideal sampling, Natural sampling and Flat top sampling, Time division Multiplexing, Generation and detection of PAM, PPM and PWM.

Unit II Digital Modulation Systems: Pulse Code Modulation, Quantization, Quantization noise, Companding, Eye pattern, Delta modulation, Adaptive delta modulation and DPCM.

Unit III Band Pass Data Transmission:ASK, Binary phase shift keying (BPSK), QPSK, DPSK, Coherent and Non coherent BFSK.

UNIT IV Information Theory Concept of information theory, Entropy and Information rate, Channel capacity, Shannon's theorem, Shannon Hartley theorem.

Unit V Coding Techniques: Coding Efficiency, Shannon Fano coding, Huffman coding.

Text Books:

1. Singh, R.P. & Sapre, S.D, "Communication Systems: Analog & Digital", Tata McGraw-Hill, 5th reprint, 2000.
2. John G. Proakis, "Digital Communication", McGraw Hill Inc, 5th Edition, 2008.

Reference Books:

1. Simon Haykin, "Communication Systems", John Wiley & Sons, 4th Edition, 2000.
2. Taub & Schilling, "Principle of Communication Systems", 2nd Edition, 2003.

Course Outcomes:

After successful completion of the course, students will be able to:

CO1: Explain the process of sampling and pulse modulation.
CO2: Analyze digital modulation systems
CO3: Describe the different band pass data transmission techniques.
CO4: Illustrate the concepts of information theory and source coding.
CO5: Apply error correcting codes in digital communication.

B.Tech IV Sem (Electronics Engineering/ Electronics & Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Proficiency	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini proj		L	T	P	
140417/ 200417	DC	Linear Control Theory	50	10	20	20	-	-	-	100	3	-	-	3

Linear Control Theory (140417/200417)

Course Objectives: learning of control system theory and its implementation in practical systems using electronic devices.

UNIT I: Introduction to Control Systems: Basic control system terminology, Open loop and Closed loop system, Feedback control, Different modeling of physical systems, Linear approximation of physical systems. Transfer function of linear systems, Block diagram algebra and Signal flow graphs, Effects of negative feedback.

UNIT II: **Time Domain Analysis:** Test input signals, First order systems, Second order systems, Effects of addition of poles and zeros to open and closed loop transfer functions, Steady state error, Constant and error coefficients for type 0, 1, and 2 systems.

UNIT III: Stability Analysis: Concept of stability of linear systems, Relation between the closed loop poles and stability, Relative stability, Absolute stability, Routh Hurwitz criteria and its applications, Root locus plot.

UNIT IV: Frequency Domain Analysis: Performance specifications in frequency domain, Co-relation between frequency domain and time domain, Polar plots and Bode plots of transfer function, Nyquist stability criterion, Assessment of relative stability.

Unit V: Introduction to Controllers: Introduction to Proportional, Integral, and Derivative controller, PD controller, PI controller, PID controller, Design of various controllers and their limitations.

Text Books:

1. Control System Engineering- I. J. Nagrath & M. Gopal, New Age International.
2. Modern Control Engineering –K. Ogata, Prentice Hall.
3. Control System- A. Anand Kumar, PHI
4. Control System Engineering – B.S. Manke, Khanna publications.

Reference Books:

1. Automatic Control System— B. C. Kuo,Wiley.
2. Control System Engineering- Norman Nise, John Wiley & Sons.

Course Outcomes:

After successful completion of the course, students will be able to:

CO1. **Determine** the transfer function of linear control system.
CO2. **Evaluate** the time domain response of control system for different standard inputs.
CO3. **Compute** the steady state error for type 0,1,2 systems.
CO4. **Analyze** the stability of control system using time and frequency domain methods.
CO5. **Design** proportional, integral, and derivative controller, PD, PI, PID controllers.

B.Tech IV Sem (Electronics Engineering/ Electronics & Telecommunication Engineering)

Code	Category Code	Subject Name	Theory Slot				Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Proficiency	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini proj		L	T	P	
140418/ 200418	DC	Analog Integrated Circuits	50	10	20	20	60	20	20	200	2	1	2	4

Analog Integrated Circuits (140418/200418)

Course objective: Students will be able to learn the concepts of power, multistage and operational amplifiers. Further, they will learn to design multivibrators using IC 555 and active filter design using Opamp.

Unit I Power Amplifiers: Introduction, Difference between voltage and power amplifier, Terms used in power amplifier, Class A power amplifier, Transformer coupled class A power amplifier, Harmonic distortion in amplifier, Class A push-pull amplifier, Class B power amplifier, Class B push-pull and complementary-symmetry power amplifier, Class AB and Class C amplifiers.

Unit II : **Operational Amplifier**: Introduction of op-amp, Block diagram, characteristics and equivalent circuits of an op-amp, Power supply rejection ratio for op-amp(PSRR), common-mode rejection ratio (CMRR), Slew rate and its Effect, Input and output offset voltages. Open and Closed loop configuration of Op-amp.

Unit III Application of Operational Amplifier: Inverting and non-inverting amplifier configurations, Summing amplifier, Integrators and differentiators, Schmitt Trigger, Logarithmic and anti-logarithmic amplifier etc.

Unit IV: Active Filter Design: Characteristics of filters, Classification of filters, Magnitude and frequency response, 1st and 2nd order Low pass and High pass ,Band pass filters and Band reject filters.

Unit V Multivibrator Design using 555 IC: The 555 IC Circuit, 555 IC block diagram, Using the 555 IC as Astable , Monostable and Bistable Multivibrator Circuits and its applications.

Text Books:

1. Electronics Devices and Circuits: Boylested& Nashelsky,11thEdition**,** Pearson Education India
2. Op-Amp and Linear Integrated Circuit: R.A.Gayakwad, 4th Edition, Prentice Hall of India.

Reference Books:

1. Integrated Electronics: Millman&Halkias, 2nd Edition,McGraw Hill Education
2. Electronics Devices and Circuits: Shalivanan, 2nd Edition, Tata Mcgraw Hill Education.
3. Microelectronic Circuits- Theory and Application: Sedra& Smith,7th Edition**,** Oxford Press.

Course Outcomes

After the completion of this course students will be able to:

- **CO1.** Compare the efficiency of various power amplifiers.
- **CO2.** Analyze the parameters of Operational amplifiers.
- **CO3.** Design the applications using Operational amplifier IC.
- **CO4.** Implement the active filters based on given specifications.
- **CO5.** Design Multivibrator circuits using IC 555.

B.Tech IV Sem (Electronics Engineering/ Electronics & Telecommunication Engineering)

Subject Code	Category Code	Subject Name	Theory Slot				Practical Slot			Total Marks	Contact Hr/week			Total Credits
			End Sem Marks	Proficiency	Mid Sem Marks	Quiz/ Assignment Marks	End Sem Mark	Lab work & Sessional Mark	Skill based mini proj		L	T	P	
100004	MC	Cyber Security	50	10	20	20	-	-	-	100	3	-	-	3

TOPIC-WISE MOOC LINKS FOR CYBER SECURITY (100004)

UNIT - 1:
Topic of the lecture: Overview of Cyber Security
Topic of the lecture: Introduction to Cyber Security, Cyber-crime
Topic of the lecture: Types of Cyber Attacks
Topic of the lecture: Cyber Vandalism (Hacking), Cyber Stalking, Internet Frauds and Software Piracy

UNIT - 2:
Topic of the lecture: Basics of Internet and Networking
Topic of the lecture: Network Topologies
Topic of the lecture: Wired and Wireless networks, E-commerce
Topic of the lecture: OSI Model:
Topic of the lecture: Internetworking Devices:
Topic of the lecture: Firewall:

UNIT - 3:
Topic of the lecture: Security Principles and Attacks
Topic of the lecture: Cryptography:
Topic of the lecture: Symmetric key Cryptography
Topic of the lecture: Symmetric key Ciphers
Topic of the lecture: Public key cryptography
Topic of the lecture: SSL

UNIT - 4:
Topic of the lecture: Hacker, Types of Hacker
Topic of the lecture: Malicious Softwares (Part 1)
Topic of the lecture: Malicious Softwares (Part 2)

UNIT - 5:
Topic of the lecture: Introduction of Intellectual Property and patent
Topic of the lecture: More About Patent
Topic of the lecture: All about Trademark
Topic of the lecture: Industrial Design
Topic of the lecture: Geographical Indication
Topic of the lecture: All about copyright
Topic of the lecture: IT act 2000
Topic of the lecture: Digital Crime Investigation

Subject Name: Digital Communication Lab
Subject Code: 140416/200416

List of Experiments

1. To perform sampling and reconstruction.
2. To identify the various encoding schemes for a given data stream.
3. To analyze pulse amplitude modulation.
4. To analyze pulse width modulation.
5. To generate amplitude shift key signal.
6. To generate amplitude shift key signal using MATLAB.
7. To generate phase shift key signal using MATLAB.
8. To generate frequency shift key signal using MATLAB.
9. To generate quadrature phase shifted key signal using MATLAB.

Course Outcome:
After successful completion of the lab, students will be able to:

CO1. Understand sampling theorem.
CO2. Perform lines coding technique.
CO3. Construct different pulse modulation technique.
CO4. Implement different digital modulation technique
CO5. Evaluate the performance of the digital communication system using MATLAB

Subject Name: Analog Integrated Circuit
Subject Code: 140418/200418

List of Experiments

1 Design of the circuit using IC 741 Op-amp
  a Summer and Subtractor
  b Inverting and Non Inverting Amplifier
  c Voltage Follower
  d Comparator and Schmitt trigger
  e Integrator and Differentiator
2 To Design the Multivibrator circuit using 555 timer IC.
  a Astable Multivibrator
  b Bistable Multivibrator
  c Monostable Multivibrator
3 To Design the RC Low pass and High pass Filter

Course Outcome:
After successful completion of the lab, students will be able to:

CO1: Design various applications using Op-amp.
CO2: Troubleshoot fabricated circuit individually and in a team.
CO3: Design various amplifier circuits.

Subject Name: Software Lab : Introduction to MATLAB
Subject Code: 140419/200419

List of Experiments

1. Study of MATLAB.
2. Write a program perform the MATRIX manipulation using MATLAB command window.
3. Write a program to plot the various ANALOG function using plot command. Also label x axis ,y axis and provide the tittle of figure.
4. Write a program to plot the various DISCRETE function using plot command. Also label x axis ,y axis and provide the tittle of figure.
5. Write a program to plot more than one ANALOG function in a single window using subplot.

6. Write a program to plot more than one DISCRETE function in a single window using subplot.
7. Write a program to plot Amplitude Modulated signal along with baseband signal.
8. Write a program to plot SSB Modulated signal along with baseband signal.
9. Write a program to plot Frequency Modulated signal along with baseband signal.
10. Write a program to plot Phase Modulated signal along with baseband signal.
11. Write a program to draw root locus of the given function.

12. 1/(2s^4+5s^3+4s^2+6s+8)

13. Write a program to draw Bode Plot of the given function.

14. 1/(2s^4+5s^3+4s^2+6s+8)

15. Write a program to draw Nyquist Plot of the given function.

1/(2s^4+5s^3+4s^2+6s+8)

Subject Name: Digital Communication Lab
Subject Code: 140416/200416

Skill Based Mini Project List

1. Implementation of sampling theorem. (a) Sampling at Nyquist rate (b) Over sampling and (c) Under sampling.
2. Implementation of Eye Diagram/Eye Pattern for any of the modulation technique.
3. PPM using IC 555.
4. PAM using IC 555.
5. PWM using IC 555.
6. Generation of On-off Keying signal.
7. Generation of ASK, FSK and PSK signal.
8. Generation of QAM signal and its constellation diagram.
9. To develop a GUI based project in MATLAB for PCM.
10. To develop a GUI based project in MATLAB for Differential-PCM.
11. To develop a GUI based project in MATLAB for Delta Modulation.
12. To develop a GUI based project in MATLAB for Adaptive Delta Modulation

Subject Name: Analog Integrated Circuit
Subject Code: 140418/200418

Skill Based Mini Project List

1. Design oscillators using 555 timer IC.
2. Design pulse generators using 555 timers IC.
3. Design one-bit memory storage element using 555 timer IC.
4. Design frequency divider circuit using 555 timer IC.
5. Design phase lock loop using 555 timer IC.

Subject Name: Software Lab : Introduction to MATLAB
Subject Code: 140419/200419

Skill Based Mini Project List

1. GUI model for various waveform generation of various frequencies anddisplay.
2. Calculator Design using MATLAB.
3. Draw and calculate the area of circle of given radius.
4. GUI model for various waveform generation and display.
5. GUI model for display of various transform of specific waves.