



III Semester

Sr No	Course Code	Course Title	Hours per Week			Credits	Maximum Marks		
			L	T	P		Continual Assessment	End Sem Examination	Total
1	AS308T	Applied Mathematics – III	4	-	-	4	30	70	100
2	ET301T	Digital Electronics	3	1	-	4	30	70	100
3	ET301P	Digital Electronics Lab	-	-	2	1	25	25	50
4	ET302T	Electronic Devices and Circuits	4	1	-	5	30	70	100
5	ET302P	Electronic Devices and Circuits Lab	-	-	2	1	25	25	50
6	ET303T	Network Theory	4	1	-	5	30	70	100
7	ET304P	Circuit simulation and Lab	-	-	2	1	25	25	50
8	H103	Constitution of India	2	-	-	0	Audit		
9	ET305T	Career Development- I	2	-	-	0	Audit		
Total			19	3	6	21	195	355	550

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
AS308T	Applied Mathematics-III	4	0	-	4	30	70	100

Course Objectives	Course Outcomes
<ol style="list-style-type: none"> 1. Introduce advanced concepts of Partial Differential Equations & Integral Transforms with their Applications. 2. Understanding of Linear Algebra through Matrices & Complex integration. 	<p>After completion of the course students are able to,</p> <ol style="list-style-type: none"> 1. Identify and solve practical problems and analyze their physical and graphical interpretation by using Laplace Transforms. 2. Use Fourier series methods to explore real-world time signals and application of Fourier Transform to analyse input-output relationships. 3. Apply the concept of advanced engineering mathematics to solve various complex engineering problems. 4. Apply concepts of partial differential equations, Integral Transforms in various practical problems. 5. Implement concept of Matrices and Eigen value problem and to solve Differential Equations. Form mathematical modal corresponding to engineering problems by using Matrices.

UNIT- I: Laplace Transform	[8Hrs]
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Definition, properties, Evaluation of Integrals by Laplace Transform, Inverse Laplace Transform and it's properties, Convolution theorem (Statement only) Laplace transform of Periodic Functions (Statement only), Unit Step Function and Unit Impulse Function, Applications of Laplace Transform to solve Ordinary Differential Equations, Integral Equations & Integral-Differential Equations.

Unit -II Fourier Series & Fourier Transform	[6Hrs]
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Periodic Functions and their Fourier expansions, Even and Odd functions, Change of interval, Half Range Expansions. Fourier Transform: Definition, properties (excluding FFT), Fourier Integral Theorem, Relation with Laplace Transform, Applications of Fourier Transform to solve Integral Equations.

Unit -III Functions of Complex Variable	
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Analytic function, Cauchy-Riemann Conditions, Harmonic Functions (excluding Orthogonal system), Milne-Thomson Method, Cauchy Integral Theorem & Integral Formula (Statement only), Taylor's & Laurent's series (statement only), Zeros and Singularities of Analytic function, Residue Theorem (Statement only), Contour integration (Evaluation of real definite integral around unit circle and semi-circle)

UNIT- IV: Partial Differential Equations	
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Partial Differential Equations of First Order First degree i.e. Lagrange's form, Linear Homogeneous Equations of Higher order with constant coefficients, Method of separation of variables, simple Applications of Laplace Transform to solve Partial Differential Equations (One Dimensional only)

Unit -V: Matrices	
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Linear and Orthogonal Transformations, Linear dependence of vectors, Characteristics equation, Eigen values and Eigen vectors statement and verification of Caley Hamilton Theorem (without proof), Reduction to Diagonal form, Sylvester's theorem (without proof), Solution of Second Order Linear Differential Equation with constant Coefficients by Matrix Method.

Text Books

S.N	Title	Authors	Edition	Publisher
1	Higher Engineering Mathematics	B.S. Grewal	40th Edition	Khanna Publication
2	Advanced Engineering Mathematics	Erwin Kreyszig	8th Edition	Wiley India
3	Applied Mathematics for Engineers & Physicist	L.R. Pipes	Harville	

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Reference Books

S.N	Title	Authors	Edition	Publisher
1	A Text Book of applied Mathematics	P.N. Wartikar & J.N. Wartikar	2	Poona Vidyarthi Griha Prakashan
2	A Text Book of Engineering Mathematics	Peter O' Neil, Thomson	--	Asia PteLtd., Singapore.
3	Higher Engineering Mathematics	B. V. Ramana	--	Tata McGraw-Hill Pub.

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
ET301T	Digital Electronics	3	1	-	4	30	70	100

Course Objectives	Course Outcomes
<ol style="list-style-type: none">To acquaint students with various basic digital gates used in digital system and develop logical circuits using Boolean gates, construction of various combinational and sequential logic circuits using basic gatesThe student will be able to analyze, design, and evaluate digital circuits of medium complexity and differentiate various logic families.	<p>After completion of the course students are able to,</p> <ol style="list-style-type: none">Explain the fundamental concepts and use the basic logic gates and various reduction techniques of digital logic circuitAnalyze, design and implement combinational logic circuitsAnalyze, design and implement sequential circuitsAnalyze, design and implement various sequential circuits and its applicationsCategorize, summarize different logic families and analyze digital system design using PLD

Unit 1 : Number System and Logic Simplification	[6Hrs]
Analog V/s Digital systems, Number Systems, Boolean algebra, Boolean identities, Digital Codes – Binary, Gray, Hex, ASCII, BCD, Self-Complimentary, Conversion, standard representations for logic functions, k map representation of logic functions (SOP & POS forms), minimization of logical functions for min-terms and max-terms (up to 4 variables), don't care conditions	
Unit 2 : Combinational Circuits	[8Hrs]
Adders, Subtractor, look ahead carry ALU, Digital Comparator, Parity generators/checkers, Multiplexers and their use in combinational logic designs, multiplexer trees, Demultiplexers, Encoders & Decoders, BCD - to 7 segment decoder, Binary Code converters	
Unit 3: Sequential Circuits	[8Hrs]
1 Bit Memory Cell, Clocked SR, JK, MS J-K flip flop, D and T flip-flops. Use of preset and clear terminals, Excitation Table for flip flops. Conversion of flip flops.	
Unit 4: Application of Sequential Circuits	[8Hrs]
Registers, shift registers, Counters (ring counters, twisted ring counters), Sequence Generators, ripple counters, up/down counters, synchronous counters.	
Unit 5 : Logic Families and Semiconductor Memories	[6Hrs]
Logic families TTL, ECL, CMOS and their characteristics – Fan-In, Fan-Out, Propagation Delay, Power dissipation, Noise Margin, Timing issues. Comparison of different logic Families. Memory elements (RAM, ROM, EPROM, EEPROM, NVRAM, SRAM, DRAM, Synchronous SRAM, DDR and QDR SRAM, Content Addressable Memory) Concept of Programmable logic devices, Logic implementation using Programmable Devices.	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Fundamentals Of Digital Circuits,	Kumar, A Anand	2	Prentice Hall of India Private Limited
2	Integrated Electronics: Analog and Digital Circuits and Systems	Millman, Jacob	1	Tata Mcgraw- Hill Publishing Company Limited
3	Microprocessor Architecture, Programming, And Applications with the 8085	Ramesh Gaonkar		Penram International Publishing Pvt Ltd.

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Reference Books

S.N	Title	Authors	Edition	Publisher
1	Ones And Zeros, Understanding Boolean Algebra, Digital Circuits and The Logic Of Sets	Gregg, John R		Prentice Hall Of India Private Limited.
2	Digital Circuits and Systems,	Venugopal, K R		Tata Mcgraw Hill Education Private Limited.
3	Digital Design- Principles And Practices	J. F. Wakerly	3rd Edition	Pearson,

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
ET301P	Digital Electronics lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
To acquire knowledge of digital electronics and implement digital logic circuits	After completion of the course students are able to, <ol style="list-style-type: none">1) Identify the various digital ICs and understand their operation.2) Analyze, design, illustrate and implement combinational logic circuits3) Design and implement sequential circuits like flip flops, registers, counters4) Develop medium complexity logic circuits.

Expt. No.	Title of the experiment
1	To verify the truth table of different Logic Gates.
2	To study and verify the NAND and NOR gates as a universal gates.
3	To implementation of Half adder and Full Adder and to verify their truth table.
4	To study and verify truth table of Multiplexer and Demultiplexer.
5	To Implement and Verify the truth table of one bit and two bit comparator using logic gates
6	To study and verify truth table of Encoder and Decoder.
7	To study and verify the truth table of different types of Flip-flops .
8	To study the functioning of Up/Down counter.
9	Design and Simulation of Arithmetic Logic Unit
10	Mini Project: Design of Code converters on Breadboard.
11	Virtual Lab

Text Books

S.N	Title	Authors	Edition	Publisher
1	Fundamentals Of Digital Circuits,	Kumar, A Anand	2	Prentice Hall of India Private Limited
2	Integrated Electronics: Analog and Digital Circuits and Systems	Millman, Jacob	1	Tata Mcgraw- Hill Publishing Company Limited
3	Microprocessor Architecture, Programming, And Applications with the 8085	Ramesh Gaonkar		Penram International Publishing Pvt Ltd.

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S.N	Title	Authors	Edition	Publisher
1	Ones And Zeros, Understanding Boolean Algebra, Digital Circuits and The Logic Of Sets	Gregg, John R		Prentice Hall Of India Private Limited.
2	Digital Circuits and Systems,	Venugopal, K R		Tata Mcgraw Hill Education Private Limited.
3	Digital Design- Principles And Practices	J. F. Wakerly	3rd Edition	Pearson,

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
ET302T	Electronic Devices and Circuits	4	1	-	5	30	70	100

Course Objectives	Course Outcomes
<ol style="list-style-type: none">To introduce basic semiconductor devices, their characteristics and applicationTo understand analysis and design of simple semiconductor devices circuitsTo learn to analyze the semiconductor devices behavior at the circuit level and its role in the various electronic applications.	<p>After completion of the course students are able to,</p> <ol style="list-style-type: none">Explain PN junction diode-types, Characteristics, and its applicationsIllustrate transistor Characteristics & Compare biasing TechniquesAnalyze and classify different types of negative feedback amplifiers.Identify different types of oscillators and Find frequency of oscillationAnalyze different types of power amplifier and Derive efficiencySummarize FET and MOSFET Characteristics and Analyze different biasing circuits for FET

UNIT- Diodes and it's applications	[9Hrs]
PN junction diode, Junction capacitance of PN junction , Zener Regulator , LED, photo diode and solar cell, Rectifiers: Half wave, Full wave and Bridge rectifiers, Types of Filters, Ripple factor, Clipper & Clamper circuits	
Unit -II BJT Biasing:	[10Hrs]
Introduction, Transistor, construction, transistor operations, BJT characteristics, Ebers-Moll Model, load line, BJT biasing and methods, Stability factor, Thermal stabilization, Thermal runaway and Compensation circuits, Transistor as an Amplifier, frequency response of amplifiers, Introduction to h parameters.	
Unit -III Negative feedback amplifier	[9Hrs]
Principle of Negative feedback in electronic circuits, Voltage series, Voltage shunt, Current series, Current shunt types of Negative feedback, Typical transistor circuits effects of Negative feedback on Input and Output impedance, Voltage and Current gains, Bandwidth, Noise and Distortion, Coupling schemes in amplifiers	
UNIT- IV:BJT Applications	[12Hrs]
Oscillators : Principle of Positive feedback, Concept of Stability in electronics circuits, Barkhausen criteria for oscillation, Principle of operation of different RC and LC oscillators, Frequency stability of an oscillators, Power Amplifiers: Power dissipation in transistors, Harmonic distortion, Amplifiers Classification, Push-pull and complementary Push-pull amplifiers, Cross-over distortion, Audio Power amplifier	
Unit -V: Field Effect Transistor and MOSFET:	[8Hrs]
JFET and its characteristics, Pinch off voltage, Drain saturation current, JFET amplifiers, CS,CD,CG amplifiers ,their analysis using small signal JFET model , FET Biasing, The FET as VVR Overview of D-MOSFET, E-MOSFET, MOSFET, pMOSFE, Introduction to CMOS circuits.	

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Text Books

S.N	Title	Authors	Edition	Publisher
1	Electronic devices and circuits	J. Millman and Halkias	2	TMH Publications
2	Electronic Devices & Circuit Theory	Boylestad & Nashelsky	2	PHI publications.
3	Electronic devices and circuits	Salivahanan, Suresh Kumar, Vallavaraj	3	TMH Publications

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Integrated Electronics, Analog & Digital Circuits & Systems	J. Millman and Halkias	2	TMH Publications
2	Electronics Principles	Albert Malvino	3	TMH Publications.
3	Electronics Circuits Discrete and Integrated ckt	Schilling & Belouve	--	TMH Publications.

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
ET302P	Electronic Devices and Circuits lab			2	1	25	25	50

Course Objectives	Course Outcomes
To study basic concepts, DC circuits, AC circuits, semiconductors, Semiconductor devices, Power supply, Bipolar and Field effect transistor amplifiers, Frequency response of amplifier.	After completion of the course students are able to, 5) Explain and demonstrate basic concepts of different semiconductor components 6) Summarize semiconductor devices and apply them in different electronic circuits. 7) Analyze different performance parameters of transistors. 8) Analyze, Formulate and classify the characteristics of semiconductor devices.

Expt. No.	Title of the experiment
1	To Plot V-I Characteristics of Si/Ge Diode.
2	To study Half Wave and Full Wave rectifier with and without Capacitor filter
3	To study Input output characteristics of Common Emitter Configuration.
4	To Determine the h-parameter of CE amplifiers.
5	To find Bandwidth of RC coupled Amplifier.
6	To Study RC Oscillator (RC-Phase Shift and Wien Bridge Oscillator).
7	To Study LC Oscillators (Colpitt's and Hartley Oscillator).
8	To study transistorized Astable Multivibrator.
9	To study Cross-over distortion in Class-B power amplifier.
10	To find the operating point of transistor.
11	To study transistor as an amplifier.
12	To study FET characteristics

Text Books

S.N	Title	Authors	Edition	Publisher
1	Electronic devices and circuits	J. Millman and Halkias	2	TMH Publications
2	Electronic Devices & Circuit Theory	Boylestad & Nashelsky	2	PHI publications.
3	Electronic devices and circuits	Salivahanan, Suresh Kumar, Vallavaraj	3	TMH Publications

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Reference Books

S.N	Title	Authors	Edition	Publisher
1	Integrated Electronics, Analog & Digital Circuits & Systems	J. Millman and Halkias	2	TMH Publications
2	Electronics Principles	Albert Malvino	3	TMH Publications.
3	Electronics Circuits Discrete and Integrated	Schilling & Beloove	--	TMH Publications.

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
						CA	ESE	Total
ET303T	Network theory	3	1		4	30	70	100

Course Objectives	Course Outcomes
<ol style="list-style-type: none"> To make the students capable of analyzing any given electrical network. To make the students learn how to synthesize an electrical network from a given impedance /admittance function 	<p>After completion of the course students are able to,</p> <ol style="list-style-type: none"> Analyze the basic of AC and DC circuits using KVL & demonstrate source transformed network. Analyze the basic of AC and DC circuits using KCL & demonstrate dual network Apply different network Theorems to AC circuit to carry out application of theorem Compare & analyze the series, parallel resonance circuits, Evaluate the network in terms of all network parameters and formulate the network transfer function in frequency domain

UNIT I- Mesh Analysis and Electric Circuits	[10Hrs]
Types of sources (Voltage & Current), Source transformation and source shifting, Concept of V-shift and I-shift. Coefficient of coupling, dot convention, dot marking in coupled coils Mesh analysis, Mutual inductance, Basic equilibrium equations, Matrix approach for complicated networks, Super mesh & Independent and Dependent sources to determine current, voltage, power, and energy.	
Unit -II Nodal Analysis and Electric Circuits	[10Hrs]
Nodal analysis, Basic equilibrium equations, Matrix approach for complicated networks, Super node analysis, Nodal analysis of circuits containing resistors, inductors, capacitors, transformers, and both independent and dependent sources to determine current, voltage, power, and energy. Series Circuit, Parallel Circuit, Principle of duality	
Unit -III Network Theorem	[10Hrs]
Superposition, Thevenin's, Norton's and Maximum Power Transfer Theorems, Reciprocity Theorem, Compensation Theorem, as applied to ac circuits for both independent sources to determine current, voltage	
UNIT- IV: Frequency Selective Networks	[8Hrs]
Significance of Quality factor. Series Resonance: Impedance, Phase angle variations with frequency, Voltage and current variation with frequency, Bandwidth, Selectivity. Effect of R_g on BW & Selectivity. Magnification factor. Parallel resonance: Resonant frequency and admittance variation with frequency, Bandwidth and selectivity. General case: Resistance present in both branches. Comparison and applications of series and parallel resonant circuits.	
Unit -V: Electric Circuit Analysis using Laplace Transform & Two Port Network Parameters and Network Functions	[12Hrs]
Electric Circuit Analysis using Laplace Transform: - Review of Laplace transform, waveform synthesis, Analysis of electric analysis using Laplace transform for stranded input, Inverse Laplace Transform Techniques, Laplace Transform of Basic R, L and C components, Two Port Network Parameters Terminal characteristics of network: Z, Y, ABCD Parameters; Reciprocity and Symmetry conditions, Applications of the parameters . Network Functions: - Network functions for one port and two port networks, Pole-zeros of network functions and network stability, Network synthesis using pole – zero plot.	

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S.N	Title	Authors	Edition	Publisher
1	Network Analysis	M.E. Van Valkenburg	--	TMH Publications
2	Network and systems	D. Roy Choudhary	--	New Age Publication
3	Linear Network Theory	Kelkar and Pandit Vallavaraj	--	Pratibha Publications

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Engineering Circuit Analysis	Hayt W.H. & J.E. Kemmerly	--	TMH Publications
2	Network analysis with Applications	William D Stanley	--	Pearson Education

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Course Code	Course Name	Th	Tu	Pr	Credits	Evaluation		
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ET304P	Circuit Simulation and Coding Lab	-	-	2	1	25	25	50

Course Objectives	Course Outcomes
<ol style="list-style-type: none">To instill in students the ability to formulate and solve engineering problems in electric and electronic circuits involving both steady state and transient conditions using MATLAB and pSpice.Learn to use the pSpice simulation software tool for the analysis of Electrical and Electronic Circuits.Learn to insert simple instructions to MATLAB, to find the solution of a system of linear algebraic equations, with constant (real and complex) coefficients.	<p>After completion of the course students are able to,</p> <ol style="list-style-type: none">Write MATLAB program for any given problem.Plot various functions using different graphical techniquesMake mathematical analysis for the given problem.Get the complete expert hand on pSpice SoftwareTo draw, analyze and plot the electronic circuits using pSpice Software

Expt. No.	Title of the experiment
1	Introduction to MATLAB/SCILAB/OCTAVE
2	To Perform Matrix operations using Scilab/Octave
3	To study elementary signals in continuous and discrete form using Scilab/Octave
4	To study if statement for calculation of roots of Quadratic equations
5	To study for/while loop for calculating factorial of a number
6	To study how to define function in MATLAB
7	To study switch case using MATLAB
8	To study Mathematical/ symbolic tool box using MATLAB
9	Introduction to Pspice
10	To study VI characteristics in forward bias, of PN junction diode using Pspice
11	To study VI characteristics in reverse bias, of PN junction diode using Pspice
12	To study output waveform of HW rectifier with and without filter using Pspice
13	To study output waveform of FW/Bridge rectifier with and without filter using Pspice
14	To study output characteristics of BJT using Pspice
15	To study proteus for simulation of basic circuit using Oscilloscope/ LED
16	To study proteus for simulation of a controller based circuit.

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Text Books

S.N	Title	Authors	Edition	Publisher
1	Introduction to PSpice Using OrCAD for Circuits and Electronics.	Muhammad Rashid	--	PHI Edition
2	SPICE for Circuits and Electronics using PSpice	Muhammad Rashid	--	PHI Edition.
3	Matlab programming for Engineers	Stephen Chapman	--	Thomson Learning Publication

Reference Books

S.N	Title	Authors	Edition	Publisher
1	Contemporary linear systems using MATLAB	Robert Strum and Donald Kirk	--	Thomson Learning Publications
2	Mastering MATLAB	Duane Hanselman & Bruce	--	Pearson Publications
3	Electronic Devices & Circuit theory	Robert Boylestad & Nashelsky	--	PHI publications

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H103	Constitution of India	2	-	-	2	15	35	50

Course Objectives	Course Outcomes
To sensitize students to social, political and economic perspective of the Indian Society through a study of the Indian Constitution	After completion of the course students are able to, <ol style="list-style-type: none">1) To understand the role of constitution in democratic India2) To know their fundamental rights and duties3) To develop better understanding of the judicial system and union executive in India4) To understand emergency, presidential provisions and electoral politics.5) To understand functions of civil services and gender representation.

UNIT I-	[5Hrs]
1. Constitution- meaning, scope and importance, making of the Indian Constitution	
2. Outstanding Features of the Indian Constitution, Unitary and Federal System	
Unit -II	[5Hrs]
1. Fundamental Rights and duties	
2. Directive Principles of State Policy	
Unit -III	[4Hrs]
1. Judiciary: Supreme Court, High Court, Judicial Review, Judicial Activism, Judicial Reform	
2. Union Executive: structure, functions	
UNIT- IV:	[4Hrs]
1. Emergency Provisions: National Emergency, President Rule, Financial Emergency	
2. Electoral Politics: Participation, Contestation, Representation, Emerging trends.	
Unit -V:	[4Hrs]
Gender and Politics in India: Issues of Equality and Representation.	
2. Functions of civil services: key roles and responsibilities	

Text Books

S.N	Title	Authors	Edition	Publisher
1	Introduction to Constitution of India	Durga Das Basu	25	LexisNexis
2	Working in a Democratic Constitution: A History of the Indian Experience	Austin Granville	--	Oxford India
3	The Indian Political System	Mahendra Pratap Singh	--	--

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