E.G.S.PILLAY ENGINEERING COLLEGE

(Autonomous)

Approved byAICTE,New Delhi|Affiliated to AnnaUniversity, Chennai Accredited byNAAC with „A"Grade|Accredited byNBA (CSE, EEE, MECH)

NAGAPATTINAM–611002

B.E.ElectronicsandCommunicationEngineering

FullTimeCurriculumand Syllabus

Second Year– ThirdSemester

Course Code	CourseName	L	T	P	C	Maximum Marks		
						CA	ES	Total
Theory Course								
1701MA301	Linear Algebra and Partial Differential Equations	3	2	0	4	40	60	100
1702CS304	Data Structures and C++	3	0	0	3	40	60	100
1702EC301	Network Analysis and Synthesis	3	2	0	4	40	60	100
1702EC302	Engineering Electromagnetics	3	0	0	3	40	60	100
1702EC303	Digital Circuits and Systems	3	0	0	3	40	60	100
1702EC304	Electronics Circuits	3	0	0	3	40	60	100
LaboratoryCourse								
1702EC351	Digital Electronics Laboratory	0	0	4	2	50	50	100
1702EC352	Electronic Circuits Laboratory	0	0	4	2	50	50	100
1702CS351	Data Structures Laboratory	0	0	2	1	50	50	100
1704GE351	Life Skills: Business English	0	0	2	-	100	-	100
	Total	**18**	**4**	**8**	**25**	**500**	**500**	**1000**

L–Lecture|T–Tutorial|P–Practical|C–Credit|CA –ContinuousAssessment| ES–EndSemester

1701MA301	ENGINEERING MATHEMATICS III (Common to B.E / B.Tech-All branches)	L	T	P	C
		3	2	0	4

Course Objectives:

1. To introduce Fourier series analysis and applications in Engineering, apart from its use in solving boundary value problems.
2. To acquaint the student with Fourier transform techniques used in wide variety of situations.
3. To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.

Unit I **PARTIAL DIFFERENTIAL EQUATIONS** **9+3Hours**

Formation of partial differential equations – Singular integrals — Solutions of standard types of first order partial differential equations – Lagrange's linear equation — Linear partial differential equations of second order with constant coefficients of homogeneous type.

Unit II **FOURIER SERIES** **9+3 Hours**

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Parseval's identity – Harmonic analysis.

Unit III **APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS** **9+3 Hours**

Classification of PDE – Solutions of one dimensional wave equation – One dimensional equation of heat conduction – Steady state solution of two dimensional equation of heat conduction.

Unit IV **FOURIER TRANSFORMS** **9+3 Hours**

Statement of Fourier integral theorem – Fourier transform pair – Fourier sine and cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity

Unit V **Z – TRANSFORMS AND DIFFERENCE EQUATIONS** **9+3 Hours**

Z - transforms – Elementary properties – Inverse Z – transform (using partial fraction and residues) – Convolution theorem – Formation of difference equations – Solution of difference equations using Z – transform.

Total: 45 + 15 Hours

Further Reading:

1. Linear partial differential equations of higher order
2. Solution of non-homogeneous partial differential equations

Course Outcomes:

After completion of the course, Student will be able to

1. Compute the solution of partial differential equations (K2)
2. Use Fourier series analysis which is central to many applications in engineering (K2)
3. Solve boundary value problem using partial differential equation.(K3)
4. Apply Fourier transform techniques used in wide variety of situations.(K3)
5. Apply Z transform techniques for discrete time systems. (K3)

References:

1. Veerarajan. T., "Transforms and Partial Differential Equations", Second reprint, Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2012.
2. Grewal. B.S., "Higher Engineering Mathematics", 42nd Edition, Khanna Publishers, Delhi, 2012.
3. Narayanan.S., ManicavachagomPillay.T.K and Ramanaiah.G "Advanced Mathematics for Engineering Students" Vol. II & III, S.Viswanathan Publishers Pvt Ltd. 1998.
4. Bali.N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 7th Edition, Laxmi Publications Pvt Ltd , 2007.
5. Ramana.B.V., "Higher Engineering Mathematics", Tata Mc-GrawHill Publishing Company Limited, New Delhi, 2008.
6. Glyn James, "Advanced Modern Engineering Mathematics", 3rd Edition, Pearson Education, 2007.
7. Erwin Kreyszig, "Advanced Engineering Mathematics", 8th Edition, Wiley India, 2007.
8. Ray Wylie. C and Barrett.L.C, "Advanced Engineering Mathematics" Tata Mc Graw Hill Education Pvt Ltd, Sixth Edition, New Delhi, 2012.
9. nptel.ac.in/courses/111105035, www.nptelvideos.in/2012/11/Mathematics.html
10. www.learnerstv.com/Free-maths-video lectures - ltv348-page1.html

1702CS304	Data Structures and C++ (Common to B.E / B.Tech-All branches)	L	T	P	C
		3	0	0	3

Course Objectives:

1. To comprehend the fundamentals of object oriented programming, particularly in C++.
2. To use object oriented programming to implement data structures.
3. To introduce linear, non-linear data structures and their applications.

Unit I	**DATA ABSTRACTION & OVERLOADING**	**9Hours**

Overview of C++ – Structures – Class Scope and Accessing Class Members – Reference Variables – Initialization – Constructors – Destructors – Member Functions and Classes – Friend Function – Dynamic Memory Allocation – Static Class Members – Container Classes and Integrators – Proxy Classes – Overloading: Function overloading and Operator Overloading.

Unit II	**INHERITANCE & POLYMORPHISM**	**9Hours**

Base Classes and Derived Classes – Protected Members – Casting Class pointers and Member Functions – Overriding – Public, Protected and Private Inheritance – Constructors and Destructors in derived Classes – Implicit Derived – Class Object To Base – Class Object Conversion – Composition Vs. Inheritance – Virtual functions – This Pointer – Abstract Base Classes and Concrete Classes – Virtual Destructors – Dynamic Binding.

Unit III	**LINEAR DATA STRUCTURES**	**9 Hours**

Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation — singly linked lists –Polynomial Manipulation - Stack ADT – Queue ADT - Evaluating arithmetic expressions

Unit IV	**NON-LINEAR DATA STRUCTURES**	**9 Hours**

Trees – Binary Tree-Binary search trees -Tree traversal -Expression manipulation -Symbol table construction - AVL trees: Rotation, Insertion, Deletion,–Redblack tree – Graph and its representations – Graph Traversals – Representation of Graphs – Breadth-first search – Depth-first search - Connected components.

Unit V	**SORTING and SEARCHING**	**9 Hours**

Sorting Techniques-Selection, Bubble, Insertion, Merge, Heap, Quick, and Radix sort -Address calculation - Linear search -Binary search -Hash table methods.

Total:	**45 Hours**

Further Reading:

B-Trees, Splay trees

Floyd - Warshall algorithm.

Course Outcomes:

After completion of the course, Student will be able to

1. Identify the model of Abstract Data Type, calculation of algorithm efficiency and designing ofrecursive algorithms.
2. Design algorithms to solve real life problems using data structures.
3. Analyze various sorting and searching algorithms.
4. Recognize the usage of Non-Linear Data structures such as Binary Search tree, AVL search treeand Heap tree in applications.
5. Solve real life problems using minimum spanning tree and shortest path algorithms.

References:

1. Deitel and Deitel, “C++, How To Program”, Seventh Edition, Pearson Education, 2013.
2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C++”, Fourth Edition, Addison-Wesley, 2013.
3. Bhushan Trivedi, “Programming with ANSI C++, A Step-By-Step approach”, Oxford University Press, 2010.
4. Goodrich, Michael T., Roberto Tamassia, David Mount, “Data Structures and Algorithms in C++”, 7th Edition, Wiley. 2016.
5. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, Mc Graw Hill, 2009.
6. Bjarne Stroustrup, “The C++ Programming Language”, 3rd Edition, Pearson Education, 2007.
7. Ellis Horowitz, Sartaj Sahni and Dinesh Mehta, “Fundamentals of Data Structures in C++”, Galgotia Publications, 2007.

1702EC301	Network Analysis and Synthesis	L	T	P	C
		3	1	0	4

Course Objectives:

1: Apply the knowledge of basic circuital law and simplify the network using reduction techniques

2: Analyze the circuit using Kirchhoff's law and Network simplification theorems

3: Infer and evaluate transient response, Steady state response, network functions

4: Obtain the maximum power transfer to the load , and Analyze the series resonant and parallel resonant circuit

5: Evaluate two-port network parameters , design attenuators and equalizer

Unit I	INTRODUCTION TO GRAPH THEORY	9+3 Hours

Linear Graphs in Electrical Networks, Basic Definitions, Incidence, Loop and cut-set matrices, Fundamental Loop and Fundamental Cut-Set Matrices, Graph Theoretic version of KCL and KVL, Loop Impedance and Node Admittance Matrices, Duality in Electrical Networks

Unit II	TWO PORT NETWORK	9+3 Hours

Network functions - Poles and Zeros of network functions - Complex frequency - Two port parameters Z,Y,H and ABCD - Scaling network functions -T and π equivalent circuits - Bridged networks - Analysis of ladder and lattice networks - Coupled circuits as two port network - Tuned circuits

Unit III	TRANSIENT RESPONSE OF RLC CIRCUITS	9+3 Hours

Transient response of RL,RC,RLC, circuit for DC input and AC input with sinusoidal excitation.

Unit IV	TRANSFER FUNCTION SYNTHESIS	9+3 Hours

Properties of LC,RL,RC driving point functions, Synthesis of driving point LC,RC and RL functions - Foster and Cauer forms- Synthesis of transfer admittance, transfer impedance with a one ohm termination - Synthesis of constant-resistance network.

Unit V	DESIGN OF FILTER	9+3 Hours

Design of filters -Low pass filters, high pass filters, band pass filters, band reject filters, Butterworth filters, m-derived filters, constant k-filters

	Total:	45+15 Hours

Further Reading:

Interrelationships between the parameters, Lattice networks - Image parameters, Stability of activenetworks,Simulation of general and ladder network , Simulation of RL, RC, LC network , Simulation offilters design, Simulation of Attenuators & Equalizers.

Course Outcomes:

After completion of the course, Student will be able to

1. Analyze the electric circuit using network theorems
2. Understand and Obtain Transient & Forced response
3. Determine Sinusoidal steady state response; understand the real time applications of maximum power transfer theorem and equalizer
4. Understand the two–port network parameters, are able to find out two-port network parameters &DC response for interconnection of two-port networks and RLC circuits.
5. Synthesize of Initial and final value theorem, Heaviside's expansion theorem.

References:

1. Franklin F.Kuo, "Network Analysis and Synthesis (5th Edition ,2012)" Wiley International;2010

2. Andreas Antoniou," Digital filters (Analysis, Design and Application)", McGraw-Hill; 2nd edition (May 15, 2000)

3. M.E.VanValkenberg, "Introduction to Modern Network Synthesis", Wiley Eastern.

4. Umesh Sinha "Network Analysis and Synthesis"SatyaPrakashan Publishers , 4th Edition 2013

5. David A Bell,"Electric Circuits Oxford Press, ", (7thEdition, 2011).

1702EC302	ENGINEERING ELECTROMAGNETICS	L	T	P	C
		3	0	0	3

Course Objectives:

1. To impart knowledgeonthebasicsofstaticelectricandmagneticfieldandtheassociated laws.
2. To give insight into the propagation of EM waves and also to introduce the methods incomputational electromagnetic.
3. To analyze the time varying fields.

Unit I **STATIC ELECTRIC FIELDS** **9 Hours**

Co-ordinatesystem–Rectangular–Cylindricalandsphericalco-ordinatesystem– Line –Surfaceandvolumeintegrals– Definitionofcurl– Divergenceand gradient–Meaning ofstokestheorem anddivergencetheorem – Coulomb'slawinvectorform –Definition of electricfieldintensity–Principleof superposition – Electricfieldduetodiscrete charges–Electricfieldduetocontinuouschargedistribution– Electricfielddueto chargesdistributeduniformlyonaninfiniteand finiteline– Electricfieldon theaxis of a uniformlychargedcirculardisc– Electricfieldduetoaninfiniteuniformlychargedsheet – Electric scalar potential – Relationship between potential and electric field – Potential due to infinite uniformly charged line – Potential due to electrical dipole – Electric flux Density – Gauss law – Proof of gauss law – Applications.

UNIT II **STATIC MAGNETIC FIELDS** **9 Hours**

Thebiot-savartlawinvectorform –Magneticfieldintensityduetoafiniteandinfinite wire carrying a current I – Magnetic field intensity on the axis of a circular and rectangularloopcarryingacurrentI–Ampere's circuitallawandsimpleapplications– Magneticfluxdensity– TheLorentzforceequationforamovingchargeandapplications –Forceonawirecarryingacurrentlplaced inamagneticfield–Torqueonaloop carrying a current I – Magnetic moment – Magnetic vector potential.

UNIT III **ELECTRIC AND MAGNETIC FIELDS IN MATERIALS** **9 Hours**

Poisson'sandLaplace'sequation– Electricpolarization –Nature ofdielectricmaterials– Definitionof capacitance– Capacitanceofvarious geometries using Laplace's equation – Electrostatic energy and energy density – Boundary conditions for electric fields – Electriccurrent–Currentdensity–Pointform ofohm'slaw– Continuityequationfor current– Definitionofinductance–Inductanceofloopsandsolenoids–Definitionof mutualinductance–Simpleexamples– Energydensityinmagneticfields.

UNIT IV **TIME VARYING ELECTRIC AND MAGNETIC FIELDS** **9 Hours**

Faraday'slaw–Maxwell'ssecondequationinintegralform fromfaraday'slaw– Equationexpressedinpointform – Displacementcurrent–Ampere'scircuitallawin integralform –Modifiedform ofampere's circuitallawasMaxwell'sfirstequationin integralform –Equationexpressedinpointform – Maxwell'sfourequationsinintegral formand differential form – Pointing vectorand the flow of power – Power flow in a co-axial cable – Instantaneous average and complex pointing vector.

UNIT V **ELECTROMAGNETIC WAVES** **9 Hours**

Derivationofwaveequation–Uniformplanewaves–Maxwell'sequationinphasor form –Waveequationinphasorform – Planewavesinfreespaceandinahomogenous material–Waveequationforaconductingmedium – Planewavesinlossydielectrics– Propagationingoodconductors–Skineffect–Linear ellipticalandcircularpolarization – Reflectionofplanewavefrom aconductor–Normalincidence–Reflectionofplane Waves by a perfectdielectric– Normal and oblique incidence – Dependence on polarization – Brewster angle.

Total: **45 Hours**

Further Reading:

Vector analysis - Vector Calculus -Principle of Superposition theorem-Natureof magnetic materials – Magnetization and permeability – Magnetic boundary conditions.

Course Outcomes:

After completion of the course, Student will be able to

1. Explain the fundamentals of electromagnetic.
2. Analyzefieldpotentialsdue tostaticchangesandstaticmagneticfields.
3. Explainhowmaterialsaffectelectricandmagneticfields.
4. Analyze the relationbetween thefieldsunder timevaryingsituations.
5. Discuss the principlesof propagationofuniformplanewaves.

References:

1. Hayt,WH.andBuck,J.A.,"EngineeringElectromagnetics",7thEdition,TMH,2007.

2. Jordan, E.C, andBalmain, K. G., "Electromagnetic Waves and Radiating Systems", 4th Edition, Pearson Education/PHI, 2006.
3.MathewN.O.Sadiku,"ElementsofEngineeringElectromagnetics",4thEdition, Oxford University Press, 2007.
4.Narayana Rao, N., "Elements of Engineering Electromagnetics", 6th Edition, Pearson Education, 2006.
5.Ramo, Whinneryand Van Duzer., "Fields and Waves in Communication Electronics", 3rd Edition, John Wiley and Sons, 2003.

1702EC303	DIGITAL CIRCUITS AND SYSTEMS	L	T	P	C
		3	0	0	3

Course Objectives:

1. To train the students in basics of digital functions
2. To impart the students in the designing ability of combinational and sequential circuits
3. To educate the students about different types of memory and programmable devices
4. To teach the students about software skill in VHDL/Verilog HDL

Unit I **BOOLEAN ALGEBRAANDLOGICGATES** **9 Hours**

Boolean Algebra: Number systems - Booleanpostulatesand laws– De-Morgan‟sTheorem - Principleof Duality-Booleanexpression-MinimizationofBoolean expressions—Minterm–Maxterm-Sum of Products (SOP)–ProductofSums (POS)– Karnaugh map Minimization–Quine- McCluskeymethod ofminimization.

LogicGates:AND,OR,NOT,NAND,NOR,Exclusive–ORandExclusive–NORImplementationsof LogicFunctionsusinggates, NAND–NOR implementations–Multi levelgate implementations - Multioutput gateimplementations.TTL and CMOSLogic and their characteristics –Tristategates

Unit II **COMBINATIONAL LOGICS** **9 Hours**

Introduction - Designprocedure–Halfadder–FullAdder–Halfsubtractor–Fullsubtractor–Parallel binary adder,parallelbinary Subtractor– FastAdder-Carry LookAheadadder–SerialAdder/Subtractor- BCDadder–BinaryMultiplier–BinaryDivider-Multiplexer/Demultiplexer–decoder-encoder– paritygenerators- paritychecker–codeconverters -MagnitudeComparator

Unit III **SYNCHRONOUS SEQUENTIAL LOGICS** **9 Hours**

Latches,Flip-flops-SR,JK,D,T,andMaster-Slave–Characteristictable andequation–Application table–Edgetriggering–LevelTriggering–Realizationofone flip flop usingotherflip flops–serial adder/subtractor-Synchronouscounters–SynchronousUp/Downcounters–Programmablecounters–Design of Synchronouscounters:statediagram- State table–Stateminimization–Stateassignment-Excitation tableandmaps-Circuitimplementation-Modulo–ncounter,Registers–shiftregisters-Universalshift registers

Unit IV **ASYNCHRONOUS SEQUENTIAL LOGICS** **9 Hours**

Design of fundamental mode andpulsemodecircuits– AsynchronousRippleorserial counter–AsynchronousUp/Downcounter - StateMachines–ProblemsinAsynchronousCircuits– Static and Dynamic Hazards - DesignofHazardFree Switchingcircuits

Unit V **PROGRAMMABLE LOGIC DEVICES AND HDL PROGRAMMING** **9 Hours**

Programmable Logic Devices: Classificationofmemories–ROM-ROM organization-PROM–EPROM–EEPROM–EAPROM, RAM–Programmable Logic Devices – Programmable Logic Array (PLA) - ProgrammableArrayLogic(PAL)–Field ProgrammableGateArrays(FPGA)-Implementationof combinational logiccircuitsusing ROM,PLA, PAL

Verilog HDL Programming: Introduction **–** Data flow model – behavioral model – structural model – HDL programs for combinational logic – HDL program for sequential logic

Total: **45 Hours**

Further Reading:

1. Design of seven segment display using basic logic gates

Course Outcomes:

After completion of the course, Student will be able to

1. Use different methods which are used to simplify the Boolean functions
2. Demonstrate different types of combinational circuits to satisfy the user requirements
3. Implement various synchronous sequential circuits
4. Practice several types of asynchronous counters
5. Explain the basics of memory and programmable logic devices
6. Discuss the HDL Program for combinational and sequential circuits

References:

1.Ronald J. Tocci, Neal S. Widmer & Gregory L. Moss, “Digital Systems: Principles and Applications”, 10th Edition, Pearson Prentice Hall, 2007

2.M.MorrisMano,“DigitalDesign”,4thEdition,PrenticeHallofIndiaPvt.Ltd.,2008/Pearson Education (Singapore)Pvt.Ltd., NewDelhi,2003

3.Joseph Cavanagh, “Verilog HDL: Digital Design and Modeling”, Taylor & Francis, 2007

4.John F.Wakerly, “DigitalDesign”,FourthEdition,Pearson/PHI,2008

5.John.MYarbrough, “Digital Logic Applications andDesign”,ThomsonLearning, 2006

6.Charles H.Roth. “FundamentalsofLogicDesign”,6thEdition,ThomsonLearning,2013

7.DonaldP.LeachandAlbertPaulMalvino,"DigitalPrinciplesandApplications",6th Edition,TMH, 2006
8.Thomas L.Floyd, "DigitalFundamentals",10th Edition,PearsonEducationInc,2011
9.Donald D.Givone,"Digital Principles and Design", TMH,2003
10.Ronald J. Tocci, Neal S. Widmer & Gregory L. Moss, "Digital Systems: Principles and Applications", 10th Edition, Pearson Prentice Hall, 2007

1702EC304	ELECTRONIC CIRCUITS	L	T	P	C
		3	0	0	3

Course Objectives:

1.To familiar with the theory, construction, and operation of Basic electronic devices.
2.To Learn about biasing of BJTs and MOSFETs
3.To Study high frequency response of all amplifiers
4.To understand the analysis and design of Feedback amplifiers,LC and RC oscillators, amplifiers, multivibrators, and time base generators.

Unit I **ELECTRONIC DEVICES** **9 Hours**

BJT:NPN-PNP-Current Equations-Input and Output characteristics of CE,CB,CC-Hybrid π Model- h parameter model-FET: JFETs – Characteristics-MOSFET- Characteristics – D –MOSFET- E-MOSFET- MESFET- Schottky Barrier Diode – Varactor Diode –Zener Diode – Tunnel Diode – Gunn Diode - LDR- UJT-SCR-LED-LCD- Optocoupler- Solar Cell

Unit II **TRANSISTOR BIASING AND SMALL SIGNAL LOW FREQUENCY MODEL** **9 Hours**

DC Load line, operating point, Various biasing methods for BJT-Design-Stability-Bias compensation, Thermal stability, Design of biasing for JFET, Design of biasing for MOSFET-BJT: Analysis of transistor amplifier CE,CC&CB Configuration using h parameters, Simplified HybridModel for CB, CE & CC configurations, Comparison of transistor amplifier configurations, DarlingtonPair. FET: Voltage Gain, Small Signal Equivalent Circuit model, Transconductance, T EquivalentCircuit Model

Unit III **HIGH FREQUENCY MODELS** **9 Hours**

BJT: Behaviour of Transistor at High Frequency, The High Frequency T Model, The Hybrid piCommon Emitter Transistor Model, - CB & CE Short Circuit Current Frequency response, FrequencyResponse of the CE Amplifier. FET: The Gate Capacitive effect, High Frequency MOSFET Model,Unity Gain Frequency, Frequency Response of CS Amplifier.

Unit IV **FEEDBACK AMPLIFIERS AND OSCILLATORS** **9 Hours**

Feedback amplifiers - Current Series, Voltage Shunt, Current shunt and Voltage Series-Classification, Barkhausen Criterion - Mechanism for start of oscillation and stabilization of amplitude, General form of an Oscillator, Analysis of LC oscillators - Hartley, Colpitts,Clapp, Franklin, Armstrong, Tuned collector oscillators, RC oscillators - phase shift – Wienbridge - Twin-T Oscillators,Quartz Crystal Construction

Unit V **TUNED AMPLIFIERS AND WAVE SHAPING CIRCUITS** **9 Hours**

Coil losses, unloaded and loaded Q of tank circuits, small signal tuned amplifiers - Analysis of capacitor coupled single tuned amplifier – double tuned amplifier-Stagger tuned amplifiers – large signal tuned amplifiers – Class C tuned amplifier – Efficiency and applications of Class C tuned amplifier-RC & RL Integrator and Differentiator circuits-Diode clippers, Diode comparator – Clampers-Collector coupled and Emitter coupled Astablemultivibrator – Monostable multivibrator–Bistablemultivibrators - Schmitt trigger circuit.

Total: **45 Hours**

Further Reading:

1.UJT saw tooth waveform generator
2. Blocking Oscillator
3.Time base circuits

Course Outcomes:

After completion of the course, Student will be able to

1. Explain the theory, construction, and operation of basic electronic devices.
2. Analyze parametric values for different biasing methods of BJT and FET.
3. Analyze the behaviour of Bipolar Junction Transistors and Field Effect Transistors at different frequency conditions.
4. Design and analyze feedback amplifiers and oscillators.
5. Design of tuned amplifiers and Multivibrators

References:

1.Jacob Millman, C. Halkias and Satyabrata Jit Electronic Devices and Circuits, 3rd Edition, Tata McGraw-Hill, 2011
2.David A. Bell, “Electronic Devices and Circuits”, Fifth Edition, Oxford University Press, 2008.
3.Donald A Neaman, “Semiconductor Physics and Devices”, Third Edition, Tata Mc GrawHill Inc. 2007.
4.Donald .A. Neamen, Electronic Circuit Analysis and Design –2nd Edition,Tata Mc Graw Hill, 2009.
5.Adel .S. Sedra, Kenneth C. Smith, “Micro Electronic Circuits”, 6th Edition, Oxford University Press, 2010
6.Robert L. Boylestad and Louis Nasheresky, “Electronic Devices and Circuit Theory”, 10th Edition, Pearson Education /

PHI, 2008
7.Jacob Millman, C. Halkias and Satyabrata Jit Electronic Devices and Circuits, 3rd Edition, Tata McGraw-Hill, 2011

1702EC351	DIGITAL ELECTRONICS LABORATORY (Common to B.E / B.Tech – CSE, IT & ECE)	L	T	P	C
		0	0	4	2

Course Objectives:

1. To impart the students in the designing ability of combinational and sequential circuits
2. To educate the students in the designing ability of synchronous and asynchronous sequential circuits
   To educate the students about different types of memory and programmable devices
3. To teach the students about software skill in VHDL/Verilog HDL

List of Experiments:

1. Verification of Boolean Theorems using basic gates
2. Design andimplementationofcodeconvertersusinglogicgates
3. Design andimplementationof4 bit binary Adder/ Subtractorand BCD adder
4. Design andimplementationofMultiplexerand De-multiplexerusinglogicgates
5. Designand implementationofencoderand decoderusinglogicgates
6. Designand implementationof parity generator and checker
7. Design and implementation of Magnitude Comparator
8. Constructionand verificationof4 bit ripple counterandMod-10/Mod-12Ripple counters
9. Design andimplementationof 3-bit synchronousup/down counter
10. ImplementationofSISO, SIPO, PISO andPIPO shift registersusing Flip- flops
11. Design of combinational circuits using HDL
12. Design of sequential circuits using HDL

Total: 45 Hours

Additional Experiments:

1. Design and Implementation of seven segment display using basic logic gates
2. One mini project using logic gates

Course Outcomes:

After completion of the course, Student will be able to

1. Demonstrate different types of combinational circuits to satisfy the user requirements
2. Implement various synchronous sequential circuits
3. Design several types of asynchronous counters
4. Write the HDL Program for combinational circuits
5. Write the HDL Program for sequential circuits

References:

1. Ronald J. Tocci, Neal S. Widmer & Gregory L. Moss, "Digital Systems: Principles and Applications", 10th Edition, Pearson Prentice Hall, 2007
2. M.MorrisMano,"DigitalDesign",4thEdition,PrenticeHallofIndiaPvt.Ltd.,2008/Pearson Education (Singapore)Pvt.Ltd., NewDelhi,2003
3. Joseph Cavanagh, "Verilog HDL: Digital Design and Modeling", Taylor & Francis, 2007
4. John F.Wakerly, "DigitalDesign",FourthEdition,Pearson/PHI,2008
5. John.MYarbrough, "Digital Logic Applications andDesign",ThomsonLearning, 2006
6. Charles H.Roth. "FundamentalsofLogicDesign",6thEdition,ThomsonLearning,2013
7. DonaldP.LeachandAlbertPaulMalvino,"DigitalPrinciplesandApplications",6thEdition,TMH, 2006
8. Thomas L.Floyd, "DigitalFundamentals",10thEdition,PearsonEducationInc,2011
9. Donald D.Givone,"Digital Principles and Design", TMH,2003

1702EC352	ELECTRONICS CIRCUITS LABORATORY (Common to B.E / B.Tech – CSE, IT & ECE)	L	T	P	C
		0	0	4	2

Course Objectives:

1. To Be exposed to the characteristics of basic electronic devices
2. To Study the characteristic of CE,CB and CS Amplifier
3. To gain hands on experience in designing electronic circuits.
4. To learn simulation software used in circuit design.

List of Experiments:

1. Characteristics of PN Junction diode and Zener Diode, FET,SCR
2. Input and Output Characteristics of CE/CB Configuration
3. Design and analysis of CE/CB/CS, Darlington Amplifier
4. Design of Series and Shunt feedback amplifiers-Frequency response, Input and output impedance calculation.
5. Design of RC Phase shift oscillator and Wien Bridge Oscillator
6. Design of Hartley Oscillator and Colpitts Oscillator
7. Design of Single Tuned Amplifier
8. Design of Clipper, Clamper,RC Integrator, Differentiator and Multivibrator circuits
9. Simulation of CE,CS amplifiers, Twin-T Oscillator and Wein Bridge Oscillator
10. Simulation of Double and Stagger tuned Amplifier
11. Simulation of Monostable Multivibrator

Additional Experiments:

1.Design of Power inverter.
2.Design of Function Generator

Course Outcomes:

After completion of the course, Student will be able to

1. Able to Learn the characteristicsand frequency response of basic electronic devices
2. Able to Analyze various types of feedback amplifiers
3. Able to Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators.
4. Able to Simulate amplifiers and oscillators using Spice

References:

1. Donald A Neaman, “Semiconductor Physics and Devices”, Third Edition, Tata Mc GrawHill Inc. 2007.
2. Donald .A. Neamen, Electronic Circuit Analysis and Design –2nd Edition,Tata Mc Graw Hill, 2009.
3. Adel .S. Sedra, Kenneth C. Smith, “Micro Electronic Circuits”, 6th Edition, Oxford University Press, 2010
4. Jacob Millman, C. Halkias and Satyabrata Jit Electronic Devices and Circuits, 3rd Edition, Tata McGraw-Hill, 2011

1702CS351	DATA STRUCTURES LABORATORY	L	T	P	C
		0	0	4	2

Course Objectives:

1. Learn C++ programming language.
2. Be exposed to the different data structures
3. Be familiar with applications using different data structures

List of Experiments:

1. Basic Programs for C++ Concepts
2. Array implementation of List Abstract Data Type (ADT)
3. Linked list implementation of List ADT
4. Cursor implementation of List ADT
5. Stack ADT - Array and linked list implementations
6. The next two exercises are to be done by implementing the following source files
   i. Program source files for Stack Application 1
   ii. Array implementation of Stack ADT
   iii. Linked list implementation of Stack ADT
   iv. Program source files for Stack Application 2
   v. An appropriate header file for the Stack ADT should be included in (i) and (iv)
7. Implement any Stack Application using array implementation of Stack ADT (by implementing files (i) and (ii) given above) and then using linked list
8. Implementation of Stack ADT (by using files (i) and implementing file (iii))
9. Implement another Stack Application using array and linked list implementations of Stack ADT (by implementing files (iv) and using file (ii), and then by using files(iii) and (iv)
10. Queue ADT – Array and linked list implementations
11. Search Tree ADT - Binary Search Tree
12. Implement an interesting application as separate source files and using any of the searchable ADT files developed earlier. Replace the ADT file alone with other appropriate ADT files. Compare the performance.

Total: 45 Hours

Additional Experiments:

1. Hash table implementation
2. Graph traversals

Course Outcomes:

After completion of the course, Student will be able to

1. After completion of the course, Student will be able to
2. **2.** Identify the model of Abstract Data Type, calculation of algorithm efficiency and designing of recursive algorithms.
3. Design algorithms to solve real life problems using data structures.
4. Analyze various sorting and searching algorithms.
5. Recognize the usage of Non-Linear Data structures such as Binary Search tree, AVL search tree and Heap tree in applications.

References:

1. F.RichardGilberg, A.Behrouz. Forouzan, Data Structures, A Pseudocode Approach with C. Thomson, 2007.
2. M. A. Weiss, Data Structures and Algorithm Analysis in C, Pearson Education, 2009.
3. Y.Langsam, M. J.Augenstein and A. M.Tenenbaum, Data Structures using C, Pearson Education,2004.
4. A. M.AhoHopcroft and J.D. Ullman, Data Structures and Algorithms, Pearson education, 2000.

1704GE351	LIFE SKILLS: VERBAL ABILITY	L	T	P	C
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Course Objectives:

1. To develop the students basic soft skills and enable them to get a job.
2. To develop the students' interpersonal skills and to enable them to respond effectively
3. To develop the students selling skills and to enable them to apply in their interview process.
4. To develop the students' Corporate Etiquettes and enable them to respond effectively
5. To develop the students' learning by practice of giving different situations.

Unit I	**Introduction to Soft Skills**	**9 Hours**

Soft Skills an Overview - Basics of Communication – Body Language – Positive attitude –Improving Perception and forming values – Communicating with others.

Unit II	**Team vs Trust**	**9 Hours**

Interpersonal skills – Understanding others – Art of Listening - Group Dynamics – Networking - Individual and group presentations - Group interactions – Improved work Relationship .

Unit III	**Selling Oneself**	**9 Hours**

How to brand oneself – social media – job hunting – Resume writing – Group Discussion – Mock G.D - .Interview skills – Mock Interview

Unit IV	**Corporate Etiquettes**	**9 Hours**

What is Etiquette – Key Factors – Greetings – Meeting etiquettes – Telephone etiquettes – email etiquettes – Dining etiquettes – Dressing etiquettes – Rest room etiquettes – Life etiquettes

Unit V	**Learning by Practice**	**9 Hours**

1. My family. Myself. 2. Meeting people. Making Contacts.3. A city. Getting about town.
4. Our flat. Home life.5Travelling. Going abroad.6. Going through Customs.7. At a hotel.8. Shopping.
9. Eating out.10. Making a phone call.11A modern office.12 Discussing business.

	Total:	**45 Hours**

Assessment Pattern:

Two assignments will be conducted (25 * 2) - 50 marks

Pragmatic Assessment - 50 Marks

Course Outcomes:

After completion of the course, Student will be able to

1. Students are enabled to communicate effectively in their business environment.
2. Learners are ensured that they improve their interpersonal skills which is mandatory in a corporate world
3. Students are trained to brand themselves to acquire a job .
4. Students are trained to involve in corporate etiquettes
5. Students are learnt to survive in the different situations

References:

1. Dr.k.Alex, "soft skills "Third Edition, S.Chand& Publishing Pvt Limited, 2009
2. Arunakoneru, 'Professional Communication' Second Edition, Tata McGraw-Hill Education, 2008
3. D.K.Sarma,'You & Your Career 'First Edition Wheeler Publishing & Co Ltd, 1999
4. Shiv Khera 'You Can Win' Third Edition Mac Millan Publisher India Pvt Limited, 2005