ACADEMIC REGULATIONS,

COURSE STRUCTURE

AND

DETAILED SYLLABUS

FOR

B.Tech - ECE I & II Year

(Applicable for the Batches admitted from 2020-2021)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY

(An Autonomous Institution under JNTUH)

Accredited by NAAC with 'A' Grade and accredited by NBA)

(Recipient of TEQIP under The World Bank Assistance)

Yamnampet, Ghatkesar, Hyderabad– 501301.

January 2021

I Year I Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	BS	S&H	8HC04	Engineering Chemistry	4	0	0	4	30	70
2	ES	IT	8FC01	Problem Solving using C	3	0	0	3	30	70
3	BS	S&H	8HC09	Matrix Methods and Calculus	2	1	0	3	30	70
4	ES	S&H	8BC01	Workshop/Manufacturing Processes	1	0	0	1	30	70
5	HS	S&H	8HC01	Oral Communication Skills	1	0	0	1	30	70
6	BS	S&H	8HC08	Basic Mathematics, Analysis and Reasoning	2	1	0	3	30	70
7	BS	S&H	8HC64	Engineering Chemistry Lab	0	0	2	1	30	70
8	ES	IT	8FC61	Problem Solving using C Lab	0	0	2	1	30	70
9	ES	S&H	8BC61	Workshop/Manufacturing Processes Lab	0	0	2	1	30	70
10	HS	S&H	8HC61	Oral Communication Skills Lab	0	0	2	1	30	70
11	BS	ECE	8C160	Comprehensive Test and Viva Voce-I (2 Mids (Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
12	BS	ECE	8C161	Technical Seminar – I	1	0	0	1	100	00
13	HS	S&H	8HC18	Orientation Course*	1	0	0	0	Marks and Grades will be given at the end of I – II Sem	
				Total	**16**	**2**	**8**	**21**	**430**	**770**

* a) Orientation Course for B. Tech I year I semester Students take place for 3 weeks durationcovering the first Two Units
b) Orientation Course for B. Tech I year II semester Students take place for covering theremaining Four Units (Units III, IV, V, and VI).

I Year II Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	BS	S&H	8HC07	Engineering Physics	3	1	0	4	30	70
2	ES	CSE	8EC01	Data Structures and C++	3	0	0	3	30	70
3	BS	S&H	8HC11	Advanced Calculus and Complex Variable	3	1	0	4	30	70
4	ES	S&H	8BC02	Engineering Graphics	1	0	4	3	30	70
5	HS	S&H	8HC02	Written Communication Skills	1	0	0	1	30	70
6	ES	EEE	8AC42	Electrical Circuits & Networks Analysis	2	1	0	3	30	70
7	ES	EEE	8AC61	Electrical Circuits & Networks Analysis Lab	0	0	2	1	30	70
8	BS	S&H	8HC66	Engineering Physics Lab	0	0	2	1	30	70
9	ES	CSE	8EC61	Data Structures (C/C++) Lab	0	0	2	1	30	70
10	HS	S&H	8HC62	Written Communication Skills Lab	0	0	2	1	30	70
11	BS	ECE	8C262	Comprehensive Test and Viva Voce-II (2 Mids (Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
12	BS	ECE	8C263	Technical Seminar – II	1	0	0	1	100	00
13	HS	S&H	8HC18	Orientation Course*	2	0	0	0	Grade evaluation	
									30	70
				Total	17	3	12	24	460	840

II Year I Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	PC	ECE	8CC01	Electronic Devices and Circuits	3	0	0	3	30	70
2	PC	ECE	8CC02	Digital Logic Design	2	0	0	2	30	70
3	PC	ECE	8CC03	Signals and Systems	3	0	0	3	30	70
4	PC	ECE	8C304	Probability Theory and Stochastic Process	2	1	0	3	30	70
5	BS	S&H	8HC14	Transform Techniques and Numerical Methods	2	1	0	3	30	70
6	HS	S&H	8HC17	Universal Human Values	2	1	0	3	30	70
7	HS	S&H	8HC03	Soft Skills	1	0	2	2	30	70
8	PC	ECE	8CC71	Electronic Devices and Circuits Lab	0	0	2	1	30	70
9	PC	ECE	8CC72	Basic Simulation Lab	0	0	2	1	30	70
10	PC	ECE	8CC73	Digital Logic Design Lab	0	0	2	1	30	70
11	PW	ECE	8C364	Comprehensive Test and Viva Voce-III (2 Mids (Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
12	PW	ECE	8C365	Technical Seminar - III	1	0	0	1	100	00
				Total	17	3	8	24	430	770

II Year II Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	PC	ECE	8CC05	Analog Circuits	2	0	0	2	30	70
2	PC	ECE	8CC06	Analog& Digital Communications	2	1	0	3	30	70
3	PC	ECE	8CC07	IC Applications	2	0	0	2	30	70
4	PC	ECE	8C408	Electromagnetic Waves and Transmission Lines	3	0	0	3	30	70
5	HS	MBA	8ZC01	Economics, Accountancy and Management Science	2	0	0	2	30	70
6	ES	IT	8FC27	Python Programming Concepts	2	0	0	2	30	70
7	HS	S&H	8HC05	Environmental Science and Ecology	2	0	0	2	30	70
8	PC	ECE	8CC74	Analog Circuits Lab	0	0	2	1	30	70
9	PC	ECE	8CC75	Analog& Digital Communication Lab	0	0	2	1	30	70
10	PC	ECE	8CC76	IC Applications Lab	0	0	2	1	30	70
12	PW	ECE	8C466	Comprehensive Test and Viva Voce-IV (2 Mids (Viva) and End Semester(Test and Viva) = 30+70)	1	0	0	1	30	70
13	PW	ECE	8C467	Technical Seminar - IV	1	0	0	1	100	00
14	PW	ECE		Summer Industry Internship - I: Evaluation will be done along with 3-1 courses						
				Total	17	1	6	21	430	770

III Year I Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	PC	ECE	8CC09	Digital Signal Processing	2	1	0	3	30	70
2	PC	ECE	8C510	VLSI Technology and Design	3	0	0	3	30	70
3	PC	ECM	8DC05	Microprocessors and Microcontrollers	3	0	0	3	30	70
4	PC	ECE	8C511	Cellular and Mobile Communication	2	0	0	2	30	70
5	PC	ECE	8C512	Antennas and Wave Propagations	2	1	0	3	30	70
6	PE	ECE		Professional Elective-I	3	0	0	3	30	70
7	PC	ECM	8DC71	Microprocessors and Microcontrollers Lab	0	0	2	1	30	70
8	PC	ECE	8C577	VLSI Technology and Design Lab	0	0	4	2	30	70
9	ES	IT	8FC72	Python Programming Lab	0	0	4	2	30	70
10	PW	ECE	8C591	Summer Industry Internship-I	0	0	1	1	30	70
11	MC	IT	8FC24	Cyber Security	2	0	0	0	Grade evaluation	
									30	70
				Total	16	2	11	23	330	770

III Year II Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	PC	CSE	8EC47	Computer Networks	2	0	0	2	30	70
2	PC	ECE	8C613	Microwave and Optical Communications	3	0	0	3	30	70
3	MC	CSE	8EC45	Artificial Intelligence	2	0	0	0	Grade evaluation	
									30	70
4	ES	EEE	8AC07	Linear Control systems	3	0	0	3	30	70
5	PE	ECE		Professional Elective-II	3	0	0	3	30	70
6	OE			Open Elective-I	2	0	0	2	30	70
7	PC	ECE	8C678	Antenna Simulation Lab	0	0	4	1	30	70
8	PC	CSE	8EC65	Computer Networks Lab	0	0	2	1	30	70
9	PC	ECE	8CC79	Digital Signal Processing Lab	0	0	4	2	30	70
10	PW	ECE	8C692	Group Project	0	0	2	1	30	70
11	PW	ECE	8C668	Comprehensive Viva Voce	1	0	0	1	30	70
12	PW	ECE		Summer Industry Internship - II: Evaluation will be done along with 4-1 courses						
Total					16	0	12	19	330	770

IV Year I Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	PC	ECE	8C714	Internet of Things and Applications	2	1	0	3	30	70
2	PC	ECE	8C715	Advanced Communications and Networks	3	1	0	3	30	70
3	HS	ECE	8C716	Intellectual Property Rights	1	0	0	1	30	70
4	PE	ECE		Professional Elective –III	3	0	0	3	30	70
5	PE	ECE		Professional Elective – IV	3	0	0	3	30	70
6	OE			Open Elective – II	2	0	0	2	30	70
7	PC	ECE	8C780	Internet of Things and Applications Lab	0	0	4	2	30	70
8	PC	ECE	8C781	Advanced Communications and Networks Lab	0	0	4	2	30	70
9	PC	ECE	8C782	Microwave and Optical Communications Lab	0	0	4	2	30	70
10	PW	ECE	8C793	Summer Industry Internship - II	0	0	1	1	30	70
				TOTAL	**14**	**2**	**13**	**22**	**300**	**700**

IV Year II Semester ECE

Sl. No	Course Type	Dept Course	Code	Name of the Course	L	T	P	C	CIE	SEE
1	PE	ECE		Professional Elective –V	3	0	0	3	30	70
2	OE			Open Elective – III	2	0	0	2	30	70
3	PW	ECE	8C894	Major Project	0	0	10	5	30	70
				TOTAL	**5**	**0**	**10**	**10**	**90**	**210**

Professional Electives

S. No	Stream	PE-I	PE- II	PE-III	PE-IV	PE-V
1	**Code**	**8C517**	**8C623**	**8C729**	**8C735**	**8C841**
	VLSI	Digital Design Through Verilog	Analog and Mixed Signal Design	VLSI Physical Design	Design Verification using System Verilog	Low Power VLSI Design
2	**Code**	**8CC18**	**8CC24**	**8C730**	**8C736**	**8C842**
	Embedded System	Advanced Computer Architecture	Embedded C Programming	Embedded System Design using ARM	Embedded Real Time Operating Systems	SystemonChip Architecture
3	**Code**	**8C519**	**8C625**	**8C731**	**8C737**	**8C843**
	Signal Processing	Digital Image & Video Processing	Transform Techniques	DSP Processors and Architectures	Bio-Medical Signal Processing	Radar Signal Processing
4	**Code**	**8C520**	**8C626**	**8C732**	**8C738**	**8C844**
	Communications	Information Theory and Coding Techniques	Software Defined Radio	Ad hoc and Wireless Sensor Networks	MIMO OFDM System	5G Communications
5		**8C521**	**8C627**	**8C733**	**8C739**	**8C845**
	Advanced Computing	Digital Image Processing	Artificial Neural Networks	Computer Vision	Machine Learning	Deep Learning
6		**8C522**	**8C628**	**8C734**	**8C740**	**8C846**
	Microwave and Radar	Phased Array Antennas	Satellite Communications	Radar Systems	Microwave Integrated Circuits	EMI/EMC

Open Electives

Sl. No	Stream	OE-I	OE-II	OE-III
1	**Code**	**8ZC05**	**8ZC19**	**8ZC15**
	Finance	Banking Operations, Insurance and Risk Management	Entrepreneurship, Project Management and Structured Finance	Financial Institutions , Markets and services
2	**Code**	**8EC72**	**8EC74**	**8EC76**
	Computer Science	Programming in Java	Database Systems Concepts	Operating Systems Concepts
	Code	**8ZC22**	**8ZC23**	**8ZC24**
3	Entrepreneurship	Basics of Entrepreneurship	Advanced Entrepreneurship	Product and Services
	Code	**8ZC25**	**8ZC26**	**8ZC27**
4	Social Sciences Stream	Basics of Indian Economy	Basics of Polity	Indian History, Culture and Geography
5	**Code**	**8CC51**	**8CC52**	**8CC53**
	ECE Stream	Electronics and Instrumentation	Fundamentals of Communication	Embedded Systems Concepts
		8CC56		
		Fundamentals of digital circuits & Microprocessors		
6	**Code**	**8AC47**	**8AC44**	**8AC45**
	EEE stream	Power Electronic Devices and Converters	Fundamentals of Measurements and Instrumentation	Fundamentals of Renewable energy sources
7	**Code**	**8BC51**	**8BC52**	**8BC53**
	Mechanical Stream	Introduction To Additive Manufacturing Processes	Principles of Operations Research	Principles of Automation and Robotics
8	**Code**	**8ZC08**	**8ZC09**	**8ZC10**
	Innovation and Design Thinking	Design literacy and Design Thinking	Co-Creation and Product Design	Entrepreneurship & Business Design

A20 - Total Credits
(Semester-wise Credit Distribution)

SL. NO	SEMESTER	CREDITS
1.	I-I	21
2	I-II	24
3	II-I	24
4.	II-II	21
5	III-I	22
6	III-II	20
7	IV-I	22
8	IV-II	10
	Total	**164**

Service Coursesoffered by ECE

Sl. No	Code	Name of Subject	Offered to Dept
1	8CC01	Electronic Devices and Circuits	ECM, EEE
2	8CC02	Digital Logic Design	ECM, EEE
3	8CC03	Signals and Systems	ECM, EEE
4	8CC71	Electronic Devices and Circuits Lab	ECM, EEE
5	8CC72	Basic Simulation Lab	ECM
6	8CC73	Digital Logic Design Lab	ECM
7	8CC05	Analog Circuits	ECM, EEE
8	8CC06	Analog& Digital Communications	ECM, EEE
9	8CC07	IC Applications	ECM, EEE
10	8CC74	Analog Circuits Lab	ECM, EEE
11	8CC75	Analog& Digital Communication Lab	ECM
12	8CC76	IC Applications Lab	ECM, EEE
13	8CC09	Digital Signal Processing	ECM, EEE
14	8CC79	Digital Signal Processing Lab	ECM
15	8CC18	Advanced Computer Architecture	EEE
16	8CC24	Embedded C Programming	EEE
17	8CC54	Analog Electronic Circuits	CSE, IT
18	8CC83	Analog Electronic Circuits Lab	CSE, IT
19	8CC55	Digital Electronics	CSE, IT

I - I

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – I	8HC04	ENGINEERING CHEMISTRY (Common to CSE, ECE and CE)	4	0	0	4

Course Objectives:

1. To understand microscopic chemistry in terms of atomic and molecular orbitals
2. To learn the preparation and applications of commercial polymers and lubricant materials
3. To learn the industrial problems caused by water and municipal water treatment
4. To acquire knowledge about different types of batteries and their working mechanism
5. To develop the concepqts and types of corrosion and the factors influence corrosion
6. To understand the control methods and protective coatings for metals and other surfaces

CO	Engineering Chemistry(8HC04)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	To understand microscopic chemistry in terms of atomic and molecular orbitals	3	2													
CO2	To learn the preparation and applications of commercial polymers and lubricant materials	2	3													
CO3	To learn the industrial problems caused by water and municipal water treatment	2	1													
CO4	To acquire knowledge about different types of	3	1													

	batteries and their working mechanism															
CO5	To develop the concepts and types of corrosion and the factors influence corrosion	1	1													
CO6	To understand the control methods and protective coatings for metals and other surfaces	1	1													
Overall PO Mapping		2	1													

UNIT - I

Atomic and molecular structure (6L)

Molecular orbitals of diatomic molecules and plots of the multicentre orbitals.Equations for atomic and molecular orbitals. Energy level diagrams of diatomics. Pi-molecular orbitals of butadiene and benzene and aromaticity.Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties.Band structure of solids and the role of doping on band structures.

UNIT - II

Plastics and Lubricants

Plastics (8L)

Polymerization-Addition and Condensation polymerization, Plastics – Thermosetting and Thermoplastics, preparation, properties and **engineering applications of plastics:** PVC, Teflon, Bakelite. Fibers: Nylon 6,6 and Dacron.

Rubbers – natural and artificial rubber, vulcanization of natural rubber, Buna-S, Buna-N and their **engineering applications.**

Fabricated Reinforcing Polymers- **engineering applications**

Lubricants

Definition, classification and function of lubricants, Types of lubrication and mechanisms – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants – Viscosity, flash and fire point, cloud and pour point and acid value.**Engineering applications.**

UNIT - III

Water Technology (8L)

(a) Introduction: - Hardness of water – types of hardness (temporary and permanent), calculation of hardness- Numerical problems. Estimation of hardness of water by EDTA Method.

(b) Water for Industrial purpose: Food, sugar, textile, paper and pharma industries, water for steam making characteristics of boiler feed water, boiler troubles- scale and sludge & Carry over (priming &foaming), boiler corrosion, caustic embrittlement.

(c) Water Treatment: Internal conditioning- phosphate, carbonate &calgon conditioning. External Treatment: Ion-exchange process. Desalination-reverse osmosis. Municipal water treatment-sedimentation, coagulation, filtration, disinfection-chlorination, ozonization. **Engineering applications: Methodology and working of mineral water plant for drinking purpose.**

UNIT - IV

Electrochemistry (8L)

Conductance – conductors (metallic and electrolytic), types of conductance – specific, equivalent and molar conductance – effect of dilution on conductance.

Free energy and emf, cell potentials, electrode potential (oxidation and reduction).Types of electrodes - redox electrode (quinhydrode electrode), metal – metal insoluble salt electrode and Ion selective electrode.Cell notation and cell reaction –Nernst equation and applications.**Engineering Applications.**

Batteries : Types of batteries

(a) Primary batteries – Lechalanche cell (dry cell), Lithium cell
(b) Secondary batteries(Accumulators) – Lead acid battery, Lithium-ion battery
(c) Fuel cells- H_2 – O_2 fuel cell and MeOH-O_2 fuel cell-advantages and applications.

Engineering applications – future water powered car, Hydrogen production and storage.

UNIT - V

Corrosion and its prevention (7L)

Corrosion – basic concepts –types of corrosion, chemical, electrochemical corrosion (absorption of O_2 and evolution of H_2). Types of electrochemical corrosion – galvanic corrosion, pitting corrosion, waterline corrosion- factors affecting the rate of corrosion.

Cathodic protection – sacrificial anodic protection and impressed current cathodic protection method.

UNIT-VI

Surface treatment (5L)

Mechanical surface treatment and coatings, casehardening and surface coating, thermal spraying, vapour deposition, Ion implantation, Diffusion coating.

Methods of metallic coatings-hot dipping (tinning and galvanizing), metal cladding (Al cladding), electroplating (copper plating) and electroless plating (nickel plating) and electroforming, ceramic, organic and diamond coating

TEXT BOOKS:

1. Engineering Chemistry: PK Jain & MK Jain, Dhanapathrai Publications (2018)
2. Engineering Chemistry: by Thirumala Chary Laxminarayana & Shashikala, Pearson Publications (2020)

REFERENCE BOOKS:

1. Textbook of Engineering Chemistry: Jaya Shree Anireddy, Wiley Publications (2019)
2. Engineering Chemistry: by &B.Rama Devi, PrsantaRath& Ch. VenkataRamana Reddy, Cengage Publications (2018)
3. Engineering Chemistry: Shashi Chawla, Dhanapathrai Publications (2019)
4. Textbook of Engineering Chemistry: SS Dara, SS Umare S. Chand Publications (2004)

Course Outcomes

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

1. Understand and analyse microscopic chemistry in terms of atomic orbitals, molecular orbitals and intermolecular forces.
2. Identify and differentiate polymers, thermoplastic, thermosetting plastics and various lubricants.
3. Recognize and select the domestic and industrial problems caused by hard water and also learn about the municipal water treatment using various methods.
4. Understand and interpret the important fundamental concepts of electrochemistry and solve the problems related to batteries.
5. Differentiate the types of corrosion and methods used to prevent the corrosion.
6. Learn and implement surface coating techniques.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – I	**8FC01**	Problem Solving using C (Common to All Branches)	3	0	0	3

Course Objectives

- To acquire problem solving skills
- To be able to develop flowcharts
- To understand structured programming concepts
- To be able to write programs in C Language

Course Outcomes:

After completion of this course student will learn

1. To formulate simple algorithms for arithmetic, logical problems and to translate the algorithms to programs(in C language)
2. To test and execute the programs and correct syntax and logical errors, to implement conditional branching, iteration and recursion
3. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
4. To use arrays, pointers and structures to formulate algorithms and programs.
5. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
6. To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.

CO	**PROBLEM SOLVING USING C (8FC01)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	Explain basic fundamentals of Computer Systems , computing environments , Computer Languages – Machine Languages	1														
CO 2	Describe C language Programs, Structure of a C Program	1														

CO 3	Describe write programs using control structures such as Pre-test and post-test loops, while, do while, for, break	2														
CO 4	Write programs implementing application on arrays	2														
CO 5	Write programs using Pointers and string handling functions	2														
CO 6	Write programs using Enumerated, Structure, Union types and files.	2														
CO		2														

UNIT I

Introduction to Programming: Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)

Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples.

From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code

UNIT II

History of C language, Characteristics of C language, Structure of C Language, C Tokens Arithmetic expressions, Operator Precedence &**Associativity**Conditional Branching and Loops Writing and evaluation of conditionals and consequent branching and **Jumping Constructs Pretest and Post test**, Iteration and loops (3 lectures)

UNIT III

Function: Functions (including using built in libraries), Parameter passing in functions, call by value, passing arrays to functions: idea of call by reference, **Storage Classes**

Recursion: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc.

Macros – Definition, comparison with functions.

UNIT IV

Arrays: Arrays (1-D, 2-D), Character arrays **Ragged Arrays and Dynamic Arrays**
Basic Algorithms Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required) Quick sort or Merge sort.

UNIT V

Pointers Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notation of linked list (no implementation) **Dynamic Memory allocation Functions**.

Strings:String Handling Functions.

UNIT IV

Structure: Structures, Defining structures and Array of Structures,
Nested Structures enum, typedef
File handling (only if time is available, otherwise should be done as part of the lab)
File Handling Functions, File Modes, File Operations

Suggested Text Books

(i) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

(ii) E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill Suggested

Reference Books

(i) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8HC09**	Matrix Methods and Calculus (Common to EEE, ECE, ME, CE)	2	1	0	3

Pre Requisites: Mathematics Knowledge at Pre-University Level

Course Objectives: To make the students to understand and expected to learn

1. Mean value theorems and their applications to the given functions, series expansions of a function.
2. Special functions such as Beta & Gamma functions and their properties, evaluation of improper integrals and the applications of definite integrals.
3. To test the convergence of a series and expansion of a function in sine and cosine terms.
4. Basic concepts of multivariable differential calculus.
5. About the linear system and some analytical methods for solution.
6. Concept of Eigen values and Eigen vectors their properties and applications.

CO	Matrix Methods and Calculus (**8HC09**)	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	Solve the problems using special functions; evaluate surface areas and volumes of revolutions.	3	3	2												
CO2	Verify the mean value theorems and also express the given function in series form using Taylor's theorem.	3	3	2												
CO3	Determine the convergence, divergence or oscillating nature of a series and express the function as trigonometric series .	3	3	2												

CO4	Compute the extreme values of a function defined with and without constraints.	3	3	2												
CO5	Check the consistency or inconsistency of a linear system and ability to solve real time problems	3	3	2												
CO		3	3	2												

UNIT-I: Calculus-1

Rolle's Theorem and Mean value theorems (Statements and Geometrical Interpretations if any); Taylor's and Maclaurin's theorems with remainders (without proof); Taylor's and Maclaurin series expansion.

UNIT-II: Calculus-2

Evolutes and involutes; Beta and Gamma functions and their properties; Evaluation of improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions.

UNIT-III: Sequences and series

Convergence of sequence and series, tests for convergence of a series. Fourier series, half range sine and cosine series, Parseval's theorem (without proof).

UNIT-IV: Multivariable Calculus (Differentiation)

Limit, continuity and partial derivatives, total derivative; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, directional derivatives, Tangent plane; Concepts of divergence and curl with physical significance.

UNIT-V: Matrices-1

Inverse of a matrix by Gauss Jordan method, rank of a matrix; System of linear equations- Rank method/Gauss Elimination method. Symmetric, skew-symmetric and orthogonal matrices;

UNIT-VI: Matrices-2

Eigenvalues and Eigenvectors; Cayley - Hamilton Theorem, Hermitian, Skew-Hermitian and Unitary matrices, Diagonalization of matrices and Orthogonal transformation.

Text Books:

(i) R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.

Reference Books:

(i) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
(ii) B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers
(iii) C Sankaraiah, A Text book of Engineering Mathematics – I, VGS Book Links
(iv) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
(v) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
(vi) P. Sivaramakrishna Das and C.Vijayakumari, Mathematics-I (calculus, Differential Equations and Linear Algebra), Pearson Publications

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

1. Verify the mean value theorems and also express the given function in series form using Taylor's theorem.
2. Solve the problems using special functions; evaluate surface areas and volumes of revolutions.
3. Determine the convergence, divergence or oscillating nature of a series and express the function as trigonometric series.
4. Compute the extreme values of a function defined with and without constraints.
5. Check the consistency or inconsistency of a linear system and ability to solve real time problems.
6. Calculate the Eigen values and Eigen vectors of a matrix and their application for orthogonal transformation.

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8BC01**	WORKSHOP/MANUFACTURING PROCESSES	1	0	0	1

Course Objectives:
Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

COURSE OUTCOMES:

- To understand various basic tools to perform simple joints using metal and wood.
- To understand the principle of various electrical and electronic appliances and their applications.
- To understand the manufacturing process of welding, casting and tin smithy and their applications.
- To understand the operation of basic as well as advanced machines used for fabrication of Metals, Plastics and Glass.

CO	WORKSHOP/MANUFACTURING PROCESSES(**8BC01**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	To understand various basic tools to perform simple joints using metal and wood	2														
CO 2	To understand the principle of various electrical and electronic appliances and their applications..	2														
CO 3	To understand the manufacturing process of welding, casting and tin smithy	2														

	and their applications															
CO4	To understand the operation of basic as well as advanced machines used for fabrication of Metals, Plastics and Glass.	2														
CO	**Overall**	2														

Unit-I

Fitting & Power Tools : Fitting Tools- Marking and Measuring tools, Cutting tool, Finishing tools-etc- basic Fitting operations, Safe working practices

Introduction to power tools- Power Hacksaw, Drill, Grinder ,etc.

Unit-II

Electrical & Electronics Appliances: Introduction, wires and wires sizes, wiring boards, common house wiring methods, symbols and house hold electrical appliances.

Unit-III

Carpentry: Introduction-Timber, Wood joints- Lap, dovetail, Tools- Marking tools, Cutting tool, Finishing tools-etc- basic carpentry operations, Wood turning lathe

Unit-IV

Plastic molding & Glass Cutting: Types of Plastics, Processing of Plastics: Injection moulding and Blow moulding. Introduction to Glass materials and physical properties -Cutting tools.

Unit-V

Casting: Importance, Advantages and limitations, Pattern, Sand Casting – Casting terms, Procedure, Applications, Die Casting– Principle and Applications,Metal joining - Various methods of Joining, Welding - Types of Welding - Weld joints, Arc welding – Principle, Coated electrode, arc welding equipment, Applications, Resistance Spot welding, Soldering and Brazing

Sheet Metal Operations - Punching, Blanking

Unit-VI

Machining: meaning, Advantages and Drawbacks, Basic concepts of machine tool, chips and cutting tool, Principle of Lathe, Drilling, and Grinding, CNC machine tools - Advantages, parts of a CNC system,Additive manufacturing – Need, principles of SLS, FDM methods

Text Books:

1. HajraChoudhury S.K., HajraChoudhury A.K. and Nirjhar Roy S.K.,

2. Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.

Reference Books:

Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, TataMcGrawHill House, 2017.

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8HC01**	Oral Communication Skills Common to CSE, ECE, CIVIL	1	0	0	1

Maximum Marks: 100
(Internal – 30 / External – 70)

Course Objectives:
To enable students to:

1. Enhance oral communication skills
2. Develop the skill of speaking extemporaneously
3. Enrich their vocabulary and subsequently hone their verbal aptitude
4. Learn to make formal presentations both online and offline.
5. Learn to listen and comprehend well
6. Learn the nuances of the art of group discussion

CO	Oral Communication Skills (**8HC01**)	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	understand, analyze and respond to the audience by listening effectively										2					
CO2	acquire the articulation of different types of sentences by practicing pause patterns and question tags. .										2					
CO3	translate and demonstrate self, participate effectively in activities like JAM, extempore										3					
CO4	. express and deliver a presentation on the given topic through role plays and situational										3					

	dialogues															
CO5	implement English language to meet the standards of corporate and real world in a group										3					
CO											3					

Unit: 1

Effective Oral Communication:

1.1. Introduction to Communication
1.2. Barriers to communication
1.3. Strategies to improve communication skills
1.4. Self introduction, introducing others and greetings

UNIT: 2

Extemporaneous Speaking:

2.1. Speaking on a topic - JAM
2.2. Use of cohesive devices in speaking
2.3. Common Errors in Spoken English

UNIT: 3 Soft Skills

3.1. Confidence Building
3.2. Etiquette

UNIT: 4

Presentation Skills:

4.1 Storytelling
4.2 Presenting data effectively in formal presentations
4.3 Managing online presentations

UNIT:5

Reading Comprehension

5.1: Reading comprehension Techniques
5.2: Practice passages

UNIT: 6

Group Discussion:

6.1 Importance of Group Discussions
6.2 Do's and Don'ts of Group Discussions

Text Book: Compiled by the faculty of Sreenidhi (for internal circulation only)

Suggested Readings: * SPOKEN ENGLISH A Self-Learning Guide to Conversation Practice by V Sasikumar P. V. Dhamija

- English for Professionals by S.S.Prabhakar Rao

- English for Business Communication by Dr.T.Farhathullah
- Professional Communication by Alok Jain, PravinS.R.Bhatia and A.M.Sheikh
- Objective English : Pearson's Publications
- Word Power Made Easy: Norman Lewis
- Business Communication Strategies :Monipally.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8HC08**	Analysis and Reasoning (Common to All Branches)	2	1	0	3

Pre Requisites: Nil

Course objectives: By learning Quantitative Aptitude and Logical Reasoning, a student can answer general problems in his everyday life within a short time with the help of quicker methods. Also it improves the certain skills of a student such as numerical and logical ability, mental capacity and also in sharpening minds. This course is very much useful for competitive examinations.

Course Outcomes:

After completion of this course students will be able to solve, the questions given on testing divisibility, HCF and LCM,averages, percentage and profit and loss, ratio and proportion simple and compound interest, time and work, time and distance and etc. Also able to solve the questions given on series completion and analogy, odd one out and coding and decoding, blood relations, directions and Arithmetical reasoning, Venn diagrams,cubes and dice, clocks and calendar.

Unit I:
Number System: Test for Divisibility, Test of prime number, Division and Remainders – HCF and LCM of Numbers – Fractions and Decimals-Vedic Mathematics-Average-Problems on Ages-Problems on Numbers- Ratio and Proportion.

Unit II:
Percentage – Profit, Loss and Discount – Partnership and Share-Simple Interest - Compound Interest.Time and Work- Pipes and Cisterns-Time and Distance- Problems on Trains- Boats and Streams, Allegation or Mixtures.

Unit III:
Mensuration: Area of Plane Figures, Volume and Surface Area of Solid Figures.
Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs-Logarithms-Permutation and Combination-Probability-Linear Equations-Quadratic Equations-Surds and Indices-Coordinate geometry.

Unit–IV:
Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.
Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous pair, Double Analogy, Word Analogy, and Number Analogy.
Classification: Word Classification, Number Classification and Letter Classification.
Coding & Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled Coding. Crypt arithmetic-Inequalities-Input Output Tracing

Unit–V:
Blood Relations– Direction sense test- Number, Ranking & Time Sequence Test –Mathematical Operations-Arithmetical Reasoning. Puzzle Test: Classification Type Questions, Seating

Arrangements, Comparison Type Questions, Sequential Order of Things, Selection Based on Given Conditions, Family Based Puzzles, Jumbled Problems.

Unit –VI:

Logical Venn Diagrams –Cubes and Dice – Analytical Reasoning-Assertions and Reason–Logical Deductions-Syllogism -Statement and Arguments-Statement and Conclusions-Clocks & Calendar-Data Sufficiency.

Text Books:

1. Quantitative Aptitude by R.S.Agarwal
2. Verbal and Non Verbal Reasoning by R.S.Agarwal.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8HC64**	Engineering Chemistry Lab (Common to CSE, ECE and CE)	0	0	2	1

Course Objectives:

The student will be able to learn:

1. To reparation of Inorganic compounds
2. To determine surface tension of a liquid
3. To determine viscosity of lubricant
4. To determine acid value of an oil
5. To estimate hardness of water
6. To analyze the amount of chloride content
7. To determine cell constant and conductance of solutions
8. To determine redox potential and emf of solutions
9. To determine the rate constant of acid
10. To synthesize a polymer (Thiakol rubber / Urea-Formaldehyde resin)
11. To synthesize a drug- Aspirin
12. To estimate of Mn^{+7} by Colorimetry method

CO	Engineering Chemistry Lab(**8HC64**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Describe the principle and theory in determination of Hardness of a water sample. Experiment the method of preparation for organic compounds.	2	2				3									
C0	Overall	2	2				3									

List of Experiments

1. Preparation of coordination complex NiDMG Complex
2. Determination of surface tension
3. Determination of viscosity
4. Saponification/acid value of an oil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTA Method
6. Determination of chloride content of water
7. Determination of cell constant and conductance of solutions (HCl Vs NaOH / Mixture of acid Vs Strong base)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$ Vs $KMNO_4$ / HCl Vs NaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis of methylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyde resin
11. Synthesis of a drug- Aspirin
12. Estimation of Mn^{+7} by Colorimetry method

Course Outcomes

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

1. Preparation of Inorganic compounds
2. Determination surface tension of a liquid
3. Determination viscosity of lubricant
4. Determination acid value of an oil
5. Estimation hardness of water
6. Analysis the amount of chloride content
7. Determination of cell constant and conductance of solutions
8. Determination of redox potential and emf of solutions
9. Determination of the rate constant of acid
10. Synthesis of a polymer (Thiakol rubber / Urea-Farmaldehyde resin)
11. Synthesis of a drug- Aspirin
12. Estimation of Mn^{+7} by Colorimetry method

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8FC61**	Problem Solving using C Lab (Common to CSE, ECE and CE)	0	0	2	1

Course Objectives:

1. To be able to understand the fundamentals of programming in C Language
2. To be able to write, compile and debug programs in C
3. To be able to formulate problems and implement in C.
4. To be able to effectively choose programming components
5. To solve computing problems in real-world.

Course Outcomes:

After completion of this course student will learn

1. To formulate the algorithms for simple problems
2. To translate given algorithms to a working and correct program
3. To be able to correct syntax errors as reported by the compilers
4. To be able to identify and correct logical errors encountered at run time
5. To be able to write iterative as well as recursive programs
6. To be able to represent data in arrays, strings and structures and manipulate them through a program
7. To be able to declare pointers of different types and use them in defining self referential structures.
8. To be able to create, read and write to and from simple text files.

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

CO	**Problem Solving using C LAB (8FC61)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Explain basic fundamentals of Computer Systems, computing environments, Computer Languages – Machine Languages. Writing/ Drawing simple Algorithms and flowcharts.	3														
CO	Overall	3														

1. **Unit I (Cycle 1)**
   1. Write an algorithm for converting a given Celsius temperature to its equivalent Fahrenheit temperature and draw a flowchart.
   2. Write an algorithm to find the largest of three given numbers and draw a flowchart.
   3. Write an algorithm and draw a flowchart for finding the roots and nature of roots of a quadratic equation, given its coefficients.
   4. Write an algorithm and flowchart for finding the first n Fibonacci numbers, give n.

2. **Unit II (Cycle 2)**
   1. Write an algorithm, flowchart, and C program for:
   2. Finding the area and circumference of a circle of given radius.
   3. Finding the volume of a sphere of given radius.
   4. Finding the lateral surface area of a right circular cone of given base radius and height.
   5. Finding selling price of an item, given its cost price and profit percent.
   6. Finding the interest on a given principal for a given period of time at a given rate of per year.
   7. Write a C program to display all the sizes of data types in C.
   8. Write a C program to display a given decimal integer into an equivalent octal number and hexadecimal number using %o and %x in printf function.

3. **Unit II (Cycle 3)**
   1. Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.
   2. Write a C program for finding the largest of three given numbers.
   3. A salesman gets a commission of 5% on the sales he makes if his sales is below Rs.5000/- and a commission of 8% on the sales that exceeds Rs.5000/- together with Rs.250/-. Write an algorithm or a flowchart and develop C program for computing the commission of the salesman, given his sales.
   4. Write a C Program to demonstrate Marcos.

4. **Unit III (Cycle 4)**
   1. Write three C programs to print a multiplication table for a given number using while, do-while, and for loops.
   2. Write a C program to compute the sum of:
   3. $1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$, given x and n.
   4. 1! + 2! + 3! + . . . + n!, given n.
   5. $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! + \ldots$ to n terms where the n^{th} term becomes less than 0.0001.

5. **Unit III (Cycle 5)**
   1. Write a C program in the menu driven style to perform the operations +, -, *, /, % between two given integers.
   2. Write a C program to find the largest and the least of some numbers given by the user.
   3. Write a C program to find the sum of the digits of a positive integer.

6. **Unit III (Cycle 6)**
   1. Write C functions for the following:
      a) A function that takes an integer n as argument and returns 1 if it is a prime number and 0 otherwise.
      b) A function that takes a real number x and a positive integer n as arguments and returns x^n.
      c) A function that takes a positive integer n as an argument and returns the n^{th} Fibonacci number.

   2. Using recursion write C functions for the following:
      a) Factorial of a non-negative integer n.

b) Number of combinations of n things taken r at a time.
c) Greatest Common Divisor of two integers.
d) Least Common Multiple of two integers.

7. Unit III (Cycle 7)

a) Write a menu driven style program to compute the above functions (cycle 6) on the choice of the function given by the user.
b) Define macros for the following and use them to find sum of the squares of the minimum and maximum of two given numbers.
    a) Larger of two numbers.
    b) Smaller of two numbers.
    c) Sum of the squares of two numbers.
c) Write a program to generate Pascal's triangle.
d) Write a program to count the number of letters, words, and lines in a given text.

8. Unit IV (Cycle 8)

1. Write a program to store the numbers given by the user in an array, and then to find the mean, deviations of the given values from the mean, and variance.
2. Write a C program to initially store user given numbers in an array, display them and then to insert a given number at a given location and to delete a number at a given location.
3. Write a program to store user given numbers in an array and find the locations of minimum and maximum values in the array and swap them and display the resulting array.

9. Unit IV (Cycle 9)

1. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
2. Write a program to find whether a given matrix is symmetric, lower triangular, upper triangular, diagonal, scalar, or unit matrix.

10. Unit V (Cycle 10)

1. Write a function to swap two numbers.
2. Write a function to compute area and circumference of a circle, having area and circumference as pointer arguments and radius as an ordinary argument.

11. Unit VI (Cycle 11)

1. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, absolute value, multiplication, division, complex conjugate) and implement them in a menu driven style.
2. Define a structure point. Write a program to find the distance between two points.
3. Define a structure student having members roll no., name, class, section, marks. Create an array of 10 students give the data and find the average marks, section-wise.

12. Unit VI (Cycle 12)

1. Write a program to:
    a) Create a file by the name given by the user or by command line argument and add the text given by the user to that file.
    b) Open the file created above and display the contents of the file.
    c) Copy a file into some other file, file names given by the user or by command line arguments.
    d) Append a user mentioned file to another file.
    e) Reverse the first n characters of a file.

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8BC61**	Workshop/Manufacturing Processes Lab	0	0	2	1

COURSE OBJECTIVES:

1) To know the different popular manufacturing process
2) To gain a good basic working knowledge required for the production of various engineering products
3) To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field
4) To identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances

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

CO-1: Use various types of conventional manufacturing Processes

CO-2: Manufacture components from wood, MS flat, GI Sheet etc. – hands on experience

CO-3: Manufacturing of components by machining like shafts, holes & threaded holes, surface finishing of components etc.

CO-4: Produce small devices / products /appliances by assembling different components

CO	Workshop/ Manufacturing Processes Lab (**8BC61**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	*After completion of the course, the student will be able to* ***fabricate*** *components with their own hands*	3														
CO 2	*Assemble different components and produce small devices of their interest.*															
CO	Overall	3														

LIST OF EXPERIMENTS

S.No	Trades	Experiment name
1	Fitting Shop	1. Preparation of T-Shape Work piece 2.Preparation of U-Shape Work piece which contains: Filing, Sawing, Drilling, Grinding.
2	Carpentry	3. Cross Half Lap joint 4. Half Lap Dovetail joint
3	Electrical & Electronics	5. One lamp one switch 6. Stair case wiring
4	Welding (Arc & Gas) & Soldering	7. Practice of Lap and Butt joint by Arc welding Demonstration: Gaswelding, Resistance welding& Soldering
5	Casting	8. Preparation of mouldcavityusing solid pattern 9. Preparation of mouldcavityusing split pattern Demonstration: pouring of molten metal
6	Tin Smithy	10. Preparation of Rectangular Tray 11. Preparation of Square box
7	Machine Shop	Turning, Drilling and grinding operations on Lathe, Drilling and grinding machines
8	Plastic molding & Glass Cutting	12 a) Injection Moulding b) Glass Cutting with hand tools
9	Domestic Appliances	Study of internal components & circuit of appliances such as Fans, Mixers, Air blower, Iron box, Rice cooker, Emergency light etc.,
10	Lab project	Making various components and / or assembling the components which can be useful in domestic / engineering applications

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8HC61**	Oral Communication Skills Lab	0	0	2	1

Maximum Marks: 100

(Internal – 30 / External – 70)

Course Objectives:

To enable students to:

1. Enhance oral communication skills
2. Develop the skill of speaking extemporaneously
3. Enrich their vocabulary and subsequently hone their verbal aptitude
4. Learn to make formal presentations both online and offline.
5. Learn to listen and comprehend well
6. Learn the nuances of the art of group discussion

CO	Oral Communication Skills Lab (**8HC61**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	Describe and use Phonetics and Speech Chain.										3					
CO2	Describe and use Speech Sounds, Monophthongs and Diphthongs in conversations.										3					
CO3	Apply and use Consonants , Consonant Sounds and apply Stress or accent in conversation. Practice Situational										3					
CO4	Dialogues, Role Play and participate in 'Just A Minute' Sessions										3					
CO5	Describe Objects/ Situations/Peopl e and practice Telephone Etiquette										3					
CO6	Review of a story , film or a novel.										3					
CO											**3**					

Unit: 1

Effective Oral Communication:

1.1. Introduction to Communication
1.2. Barriers to communication
1.3. Strategies to improve communication skills
1.4. Self introduction, introducing others and greetings

UNIT: 2

Extemporaneous Speaking:

2.1. Speaking on a topic - JAM
2.2. Use of cohesive devices in speaking
2.3. Common Errors in Spoken English

UNIT: 3 Soft Skills

3.1. Confidence Building
3.2. Etiquette

UNIT: 4

Presentation Skills:

4.1 Storytelling
4.2 Presenting data effectively in formal presentations
4.3 Managing online presentations

UNIT:5

Reading Comprehension

5.1: Reading comprehension Techniques
5.2: Practice passages

UNIT: 6

Group Discussion:

6.1 Importance of Group Discussions
6.2 Do's and Don'ts of Group Discussions

Text Book: Compiled by the faculty of Sreenidhi (for internal circulation only)

Suggested Readings: ***** SPOKEN ENGLISH A Self-Learning Guide to Conversation Practice by V Sasikumar P. V. Dhamija

- English for Professionals by S.S.Prabhakar Rao
- English for Business Communication by Dr.T.Farhathullah
- Professional Communication by Alok Jain, PravinS.R.Bhatia and A.M.Sheikh
- Objective English : Pearson's Publications
- Word Power Made Easy: Norman Lewis
- Business Communication Strategies :Monipally.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8C160**	Comprehensive Test and Viva –Voce – I	1	0	0	1

CO	**Comprehensive Test and Viva Voce-I (8C160)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Assess the relevant courses they have undergone till the completion of that academic year. Comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills. They are asked to comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills. Assessment is done in the relevant courses they have undergone till the completion of that academic year.	3	2								2			3		
CO	Overall	3	2								2			3		

Comprehensive Test and Viva Voce	**The subjects studied in the Semester concerned related to branches concerned and for placements**
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks :

*Comprehensive Test	: 70 marks
**Viva Voce	: 30 marks
Total	: 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.
End Semester Examination for Comprehensive Test will be taken for 50 marks.
Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.
End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.
The total for Viva Voce will be 30.

Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.
The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P/D**	**C**
I – I	**8C161**	Technical Seminar - I	1	0	0	1

Course Objective :

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

Course Outcomes: After completing this course, the student will be able to

1. Identify current general, political and technology related topics.
2. Arrange and present seminar in a effective manner
3. Collect, survey and organize content in presentable manner
4. Demonstrate oratory skills with the aid of Power Point Presentations
5. Exhibit interview facing skills and team leading qualities

CO	Technical Seminar-I (**8C161**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Identify a topic from the current technologies of their choice in the electronics and communication Engineering domain and the allied fields, after surveying in the internet resources, journals and technical magazines in the library	3	3		2					**2**	1		3	3		3
CO2	Arrange the contents of the presentation and also write the report of the research paper.	2	2		2					**2**	3		2	3		3
CO3	Present the technical topic in front of the panel and the fellow students, using the oratory skills and also submit the report of the research paper.	1	2		1					**2**	3		1	2		1
CO4	Interact through answering the questions and also can add some points to the seminar	1	3		2					**2**	3		1	2		1
CO	Overall	2	3		2					2	3		2	3		2

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.

6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9^{th} week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

Syllabus for B. Tech I Year I semester
Electronics and Communication Engineering

ORIENTATION COURSE

(Common to all branches)

Code: 8HC18

L	T	P/D	C
1	0	0	0

Course Objectives:

This introductory course input is intended

- *To help the students appreciate the essential 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.*
- *To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.*
- *To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature. Thus, this course is intended to provide a much needed orientational input in value education to the young enquiring minds.*

Course Outcomes: *At the end of this course, the student will be able to*

1. *Learns Being a human, understands human values and purpose of education*
2. *Understands the importance of different harmony levels needed. Understand Self and being in the current moment are the sources of happiness.*
3. *Improves Learning capabilities and communication skills.*
4. *Improves Personality Development and Life Skills*
5. *Understands and appreciate the importance of personality development and yoga for a holistic life.*
6. *Understands the essence and Values and Social responsibilities for successful life.*

Unit	Name of the Module	Number of Periods
a) **Orientation Course for B. Tech I year I semester Students – 3 weeks duration covering the following Two Units**		
I	Universal Human Values – Introduction	8
II	Universal Human Values – Relationships	8
b) **Orientation Course for B. Tech I year II semester Students –covering the following Four Units**		
III	Improving Learning Capabilities (ILC) - Basic Skills of Learning	12
IV	Improving Learning Capabilities (ILC)- Personality Development and Life Skills	12
V	Literature, Proficiency Modules(PM) in English, Health, Yoga & Diet, Co-Curricular & Extracurricular activities	12
VI	Lectures by Eminent Persons on Science, Technology & Environment, Research, Innovation & Patents,Local Visit to Village and City including Hi-tech City. Feedback on last but one day of Orientation Course	12
Total Number of Periods		**64**

Unit - I

Universal Human Values

Introduction -Self – Exploration, Basic human aspirations, Need for a holistic perspective, Role of Education, Understanding Happiness, Understanding the human being – Self and Body.

Unit - II

Universal Human Values

Relationships-Understanding Relationship –Trust and Respect.Harmony in the Society, Natural Environment, Participation in nature Harmony in nature/existence.

Unit - III

Improving Learning Capabilities-Basic Skills of Learning

Principles of Learning, Study Skills & E-Learning, Listening Skills, Effective Reading and Reviewing, Reading Comprehension, Textbook Reading Strategies, Test taking strategies, Introduction to Soft Skills and Employability Skills, Interpersonal skills.

Unit - IV

Improving Learning Capabilities-Personality Development and Life Skills

Goal Setting, Motivation, Time Management, Positive Attitude, Decision Making, Building Self-confidence, Attributes of a Good Personality, Memory Management, Characteristics of a successful student, Responsibilities of Students in shaping themselves, Morals, Ethics & Values, Difference between Studying in a Professional College and High School / Junior College

Unit - V

Literature, Proficiency Modules(PM) in English, Health, Yoga & Diet, Co-Curricular & Extracurricular activities

Literature -History of human civilization, Indian civilization, Indus valley civilization and culture, history of religions, the basic tenets of Christianity, Islam, Hinduism, Buddhism, Jainism, Sikkim and Judaism, Indian culture and values.

Proficiency Modules in English - Strategies to improve proficiency in English skills(L/S/R/W), Exercises based on Remedial grammar, Exercises on Remedial Vocabulary

Health- Dimensions of Health, Basic activities of daily living, Instrumental activities of daily living, Types of Health, Factors affecting health

Yoga - Introduction to Yoga, Kinds of Yoga, Pranayama and Dhyana (Meditation)

Diet- Balanced Diet, Components of Diet, Health Eating Pyramid.

Co-curricular andExtraCurricular activities

Unit - VI

Lectures by Eminent Persons, Research, Innovation & Patents and Local Visit

Lectures by Eminent Persons on Science, Technology & Environment,

Innovations R&D and Entrepreneurship-Sreenidhi HUB, Basics of Innovation, Entrepreneurship and Intellectual Property Rights (IPR)

Local Visit to Village and City including Hi-tech City.

Feedback on last but one day of Orientation Course

Text Books:

1. RR Gaur, R Sangal, GP Bangaria, 2009, A Foundation Course in Value Education (English).

Reference Books:

1. Yoga, Food and Health (by Swami Guru PremanandaSaraswati)

I - II

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Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8HC07**	Engineering Physics	3	1	0	4

Course Objectives

- Explain about the Quantum Mechanics to understand wave particle duality, necessity of quantum mechanics to explore the behavior of sub atomic particles. Schroedinger's Time Independent Wave Equation, Physical Significance of the Wave Function – Application of Schroedinger wave equation.
- To understand the basic concepts of normal light, Laser and its applications and to know about the fiber optics, principle (TIR), Numerical Aperture, Types of optical Fibers, Step index and graded index Fibers, attenuation in optical fibers. Applications: optical fiber communication system, fiber optic sensors, medical endoscopy.
- To study the concepts of magnetism and superconductivity, Bohr magneton, Hysteresis nature, domain structure, Meissner effect, types of superconductors, BCS theory and applications of superconductors.
- To understand the concepts of dielectrics, polarizations and its types, internal fields, Clausius-Mossitti equation, Frequency and temperature effect on dielectrics and its applications – Piezo-electricity, Pyro-electricity and ferro-electricity.
- To know about the semiconductors, types, carrier concentration, Thermistor, Hall effect and also to understand the concept of PN-junction, I-V Characteristics, LED, Solar Cell and Photo diode.
- To discuss about the nano-technology, preparation techniques and characterization (XRD, SEM & TEM), CNTs and to know about the fundamentals of radioactivity and its applications.

CO	**Engineering Physics (8HC07)**	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Explain semiconductor behaviour, types and their applications	3														
CO2	Differentiate the wave and particle, and its application for a particle in one dimension box	2														
CO3	Explain about emission, its types, laser principle and applications of optical fibers (sensors and medical	3														

	endoscopy)															
CO4	Reveals about the magnetism-its origin and types and its applications	3														
CO5	Explain the basic concepts of dielectric materials, polarization and its types, their applications (piezo, ferro and Pyro electricity).	1														
CO6	Summarize nano & bulk concepts, surface to volume ratio and its applications.	2														
CO		2														

Unit:1

Wave nature of particles, Schroedinger equation and its application

Waves and Particles, de Broglie Hypothesis, Matter waves, Davisson and Germer's Experiment, G.P. Thomson Experiment, Heisenberg's Uncertainty Principle, Schroedinger's Time Independent Wave Equation – Physical Significance of the Wave Function – Application of Schroedinger wave equation - Particle in One Dimensional Potential Box.

Unit:2

Lasers

Characteristics of LASER, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them and significance, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers in engineering and medicine.

Fiber optics

Introduction, Principle of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers, Step index and graded index Fibers Attenuation in Optical Fibers. Applications: Optical Fiber communication system, Fiber Optic Sensors, Medical Endoscopy.

Unit:3

Magnetic and Superconducting materials

Permeability, Field Intensity, Magnetic Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magneton.Hysteresis behavior of Ferro Magnetic materials based on Domain theory. Hard and Soft Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials and their applications, **Super conductivity**, effect of Magnetic Field, Critical current

density, Meissner effect, Type-I and Type-II superconductors, BCS theory, applications of superconductors.

Unit:4

Dielectric materials and their properties

Electric Dipole, Dipole Moment, Dielectric Constant, Electric Susceptibility, Electronic and Ionic polarizability (Quantitative) Orientation Polarization (Qualitative), Internal fields in Solids, Clausius - Mossotti equation, Frequency and temperature effect on Dielectrics (Qualitative), Applications - Piezo-electricity, Pyro-electricity and Ferro-electricity.

Unit:5

Semiconductors

Fermi Level in Intrinsic and Extrinsic Semiconductors, calculation of carrier concentration of Intrinsic Semiconductors (quantitatively) and Extrinsic Semiconductors (qualitatively), Direct & Indirect Band Gap Semiconductors, Thermistor, Hall Effect in semiconductors and applications.

Semiconductor devices

Formation of a PN Junction and working of a PN Junction, Energy band Diagram of a open circuited PN Diode, I-V Characteristics of PN Junction, Application - LED, Solar Cell and Photo diode.

Unit:6

Nanotechnology

Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication, Sol-gel, Precipitation, Chemical vapor Deposition(CVD); Top-down Fabrication; Thermal evaporation, Ball Milling, Characterization of Nano materials (XRD&TEM), carbon nano tubes(CNTs), Applications of Nano Materials.

Nuclear Energy: Radioactivity, Nuclear binding energy, Nuclear fission, Nuclear fusion, □, β, γ rays decay, Geiger-Muller counter and practical applications of nuclear physics.

Text Books:

1. B.K. Pandey & S. Chaturvedi Engineering Physics, Cengage Learning

Reference Books:

1. P K Palanisamy, Engineering Physics, Sitech Publications
2. Charles Kittel, Introduction to Solid State Physics, John Wiley Publisher
3. A.S. Vasudeva , Modern engineering Physics, S Chand
4. Dekker, Solid State Physics
5. Dr.M.N. Avadhanulu, Engineering Physics, S Chand
6. Dekker, Solid State Physics
7. Halliday and Resnick, Physics
8. S.O. Pillai, Solid State Physics
9. A. Ghatak - Optics

Course Outcomes

After completing the course, students are able to

- Differentiate the wave and particle, de-Broglie matter waves-its experimental evidence, Schroedinger's wave concept and its application for a particle in one dimension box.
- Explain about emission, its types, laser principle, types, working and its applications and to reveals about TIR principle, optical fiber-types and signal propagation, attenuation, communication system and applications of optical fibers (sensors and medical endoscopy)
- Reveals about the magnetism-its origin and types, Hysteresis, domain theory, Anti-ferro and ferri-magnetism, Superconductivity, experimental facts, theoretical analysis, types of superconductors and its applications.
- Explain the basic concepts of dielectric materials, polarization and its types, local fields, frequency and temperature effect on dielectrics and their applications (piezo, ferro and Pyro electricity).
- Explain semiconductor behavior, types, carrier concentration, Hall effect, Thermistor, demonstrate and analyze semiconductor devices like a PN-junction, I-V characteristics, LED, solar cell, photo diode and their applications.
- Summarize nano& bulk concepts, surface to volume ratio, quantum confinement, CNTs and preparation methods (physical & chemical), analysis the techniques like XRD, SEM, TEM and also to understand the radioactivity, fusion & fission, alpha, beta and gamma rays decay and its applications.

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Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8EC01**	Data Structures and C++	3	0	0	3

Course Objective:

1. Understand the concepts of Abstract data Type, linear data structures such as stacks, queues and lists and theirapplications.
2. Comprehend different nonlinear data structures such as trees and graphs and analyze their timecomplexities.
3. Understand object-oriented programming and advanced C++ concepts and be able to write programs with C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, Template setc.

Course Outcomes:

1 Explain Abstract data type, stack and Queues with their applications

2 Write programs on Singly linked lists, doubly linked lists, Circular list and explain their operations.

3 Explain concepts of Trees, AVL Trees and Graphs with examples and applications.

4 Describe and solve problems of searching and sorting and evaluate the time complexity of each algorithm.

5 Explain concepts of OOPs and implement programs using objects, classes, constructors and destructors.

6 Explain and apply concepts of oops, write programs implementing functions, operator overloading and inheritance.

CO	**Data Structures and c++ (8EC01)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Explain Abstract data type, stack and Queues with their applications	3	1	2												
CO2	Write programs on Singly linked lists, Doubly linked lists, Circular list and explain their operations.	3	1	2												
CO3	Explain concepts of Trees, AVL Trees and Graphs with examples and applications.	3	2	2												
CO4	Describe object oriented	3	3	2												

	programming approach and its elements															
CO5	Write and explain programs on searching , sorting and hashing operations	3	2	2												
CO6	Explain and apply concepts of oops , write programs implementing function and operator overloading. Writing programs with inheritance.		2	2												
CO	Overall	3	2	2												

UNIT I:

Introduction to data structures: Abstract data type (ADT), Stacks, Queues and Circular queues and their implementation with arrays.Applications of Stack: infix to post fix conversion, postfix expression evaluation. Applications of Queues.

UNIT II:

Singly linked lists, Advantages of Linked lists over Arrays, Doubly linked lists, Circular list and their operations, representing stacks and queues with Linked lists.

UNIT III:

Trees- Binary trees, terminology, representation, traversals. AVL trees, AVL tree operations: Insertion, deletion and searching. Graphs- terminology, representation, graph traversals (DFS and BFS).

UNIT IV:

Searching –Searching: Linear and binary search methods. Sorting: Quick sort, Merge sort.Performance analysis of Searching and Sorting Algorithms. Heaps: Introduction, Min Heap, Max Heap, Operations on Heaps, Heap Sort. Hashing: Hash Table, Hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing.

UNIT V:

Introduction to C++ programming-object oriented programming concepts, Structured Vs OOP. Classes and objects-class definition, Objects, class scope and accessing members, Constructors-default constructor, parameterized constructor, copy constructor.Destructor.

UNIT VI:

Static class members, this pointer, friend functions, Dynamic memory management with operators new and delete. Overloading-function overloading, Operator overloading, restrictions on operator overloading, overloading unary and binary operators, templates, inheritance: single, multiple and multi level inheritance.

TEXT BOOKS:

- Data Structures and C++ by Reema Thareja
- Data Structure through C by Yashavant Kanetkar.
- The complete reference C++ By HerbSchildt.

REFERENCES:

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. Data Structures and Algorithms. Addison Wesley,1983.
2. Data Structures using c Aaron M.Tenenbaum , Yedidyah Langsam,Moshe JAugenstein.
3. Introduction to Data Structures in C ByKamtane
4. Data Structures, A pseudocode Approach with C by Richard F. Gilberg and Behrouz A. Forouzan.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8HC11**	Advanced Calculus and Complex Variable (Common to EEE, ECE, ME & CE)	3	1	0	4

Course Objectives:

To make the students to understand and expected to learn

1. Various analytical methods to solve first order first degree and also the equations not of first degree ordinary differential equations.
2. Methods to solve higher order ordinary differential equations.
3. Multiple integration and its applications
4. Concepts of vector integration.
5. Basic concepts of Complex Analysis and conformal mapping and their properties.
6. Series expansion of a function using Taylor's and Laurent's series. Evaluation of definite integrals and improper integrals.

Course Outcomes:

After the course completion the students will be able to

1. Find the solutions of first order first degree and not of first degree differential equations and their applications such as Newton's law of cooling, Natural growth and decay.
2. Identify and solve higher order ordinary differential equations with constant coefficients using some standard methods and also their applications in LCR circuits.
3. Solve the problems of multiple integrals and apply these concepts for finding the parameters like surface area, volume, center of mass and centre of gravity.
4. Solve problems of Line, Surface and Volume integrals.
5. Understand the concept of analyticity of a function; solve the problems on conformal mapping.
6. Express the functions of a complex variable in series form also able to evaluate definite and improper integrals using complex integration.

CO	Advanced Calculus and Complex Variable (**8HC11**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Evaluate the rank of matrix, and able to find the solution to a linear system.	3	2	2								1				
CO 2	Find eigen values and eigen vectors and their applications	3	2	2								1				

	to find higher powers and inverse of a matrix.															
CO3	Form partial differential equations and find the solution to first order linear and nonlinear partial differential equations.	3	2	2								1				
CO4	Solve the problems in evaluating Laplace and inverse Laplace transforms and its applications to solve ordinary differential equation with constant coefficients.	3	2	2								1				
CO5	Solve problems on Z-transform and its application to solve difference equations.	3	2	2								1				
CO6	6. Find the Fourier series of a function; solve the problems in finding Fourier transformations and their applications.	3	2	2								1				
CO	Overall	3	2	2								1				

UNIT - I

First order ordinary differential equations: (10 L)

Exact, equations reduced to exact; linear and Bernoulli's equations; Orthogonal Trajectories, Newton's Law of Cooling, Law of natural Growth/Decay.

UNIT – II

Ordinary differential equations of higher order: (10 L)

Higher order linear differential equations with constant coefficients-Standard types of finding P.I, method of variation of parameters, Cauchy-Euler equation.

UNIT – III

Multivariable Calculus (Integration (12 L)
Multiple Integrals: Double integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar), Triple integrals (Cartesian), Applications: areas and volumes.

UNIT – IV

Vector Integration (8 L)
Line integrals, Surface integrals, Volume Integrals, Green, Gauss divergence and Stokes theorems (without proofs).

UNIT – V

Complex Variable – Differentiation: (8 L)
Differentiation, analytic functions, Cauchy-Riemann equations, harmonic functions, finding harmonic conjugate.Conformal mapping:Translation, Inversion, Rotation and Magnification, Invariance of circles and cross ratio-Determination of bilinear transformation – mapping three given points.

UNIT – VI

Complex Variable – Integration: (12 L)
Cauchy - Integral theorem (without proof), Cauchy Integral formula (without proof), singularities, zeros of analytic functions, Taylor's series, Laurent's series; Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral involving sine and cosine.

Text Books:

1. R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.

Reference Books:

(i) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

(ii) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

(iii) Engineering Mathematics, Srimanta Pal, OXFORD university press.

(iv) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

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Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8BC02**	Engineering Graphics	1	0	4	3

Course objectives:

1. To teach students the basic principles of Engineering graphics and instruments used
2. To introduce the concept of projections in drawing and its applications for simple drawing entities
3. To impart the knowledge of various types of solids and their projections in different position wrt principle planes
4. To teach the concept of sections of solids and their applications
5. To develop a clear understanding of the basic principles involved in three dimensional Engineering drawings.
6. To train the students for the extraction of multiple views from a solid model using AutoCAD

Course outcomes

After completing this course, the student will able to:

1) Get familiar to use the instruments to solve the engineering problem and draw various type of curves used in engineering
2) Understand and Implement Orthographic projections and draw projections of simple drawing entities such as points Lines, and Planes
3) Draw projections of different types of regular solids in various positions wrt principal planes of projection
4) Draw Sections of various Solids including Cylinders, cones, prisms and pyramids and draw the developments of these solids and their sections.
5) Construct Isometric Scale, Isometric Projections and Views and convert 3D views to 2D orthographic views
6) Understand from basic sketching through 2D and 3-D solid modeling using computer aided design (CAD) software

CO	**ENGINEERING GRAPHICS (8BC02)**	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	Get familiar to use the instruments to solve the engineering	3		1												
CO2	Understand and Implement Orthographic	2		1												
CO3	Draw projections of	2		1												

	different types of regular solids															
CO4	Draw Sections of various Solids including Cylinders, cones, prisms and pyramids	2		1												
CO5	Construct Isometric Scale, Isometric Projections and Views and convert 3D views to 2D orthographic views	2		1												
CO6	Understand from basic sketching through 2D and 3-D solid	2		1												
CO		2		1												

UNIT – I

Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, Lettering, Dimensioning-Terms & notations, placing of dimensions, general rules of dimensioning.

Curves used in Engineering Practice and their Constructions: Conic Sections including Rectangular Hyperbola - General method, Cycloid and Involutes of circles

Scales: Reducing, Enlarging and Full Scales, types of scales, Construction of plain scales and diagonal scales only-simple problems

UNIT – II

Orthographic Projection: Principles of Projection – Methods of projection, First angle and third angle projections, Projections of Points, Projections of straight lines –line inclined to one plane and line inclined to both reference planes

UNIT –III

Projections of regular Planes: types of planes, plane inclined to one reference plane, Oblique planes

Projections of regular Solids: types of solids, Projections of: Prisms, Cylinders, Pyramids, Cones – simple position and axis inclined to one plane only

UNIT –IV

Sections and sectional views of Solids: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

Development of Surfaces: Methods of development, Development of lateral Surfaces of Right Regular Solids – Prisms, Cylinders, Pyramids, Cones and their sections.

UNIT – V

Isometric Projection: Meaning, Isometric axes, lines and planes, Isometric Scale – Isometric drawing or View – Isometric drawing of planes and simple solids such as prisms, pyramids, cylinder, cone

UNIT –VI

Conversion of isometric views to orthographic views of simple objects.

Overview of Computer Graphics(Demonstration only) : Demonstrating features of the CAD software - The Menu System, Toolbars, , Dialog boxes and windows, Drawing entities - lines, circles, arcs etc and editing commands, Dimensioning of objects, 2 D drawings-simple exercises , 3D wire-frame and shaded solids- Commands, Boolean operations.

TextBook:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House (In First-angle Projection Method)

Reference Books:

1. Shah, M.B. &Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
2. Agrawal B. &Agrawal C. M. (2012), Engineering Graphics, TMH Publication
3. AUTOCAD Software Theory and User Manuals

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Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8HC02**	Written Communication Skills	1	0	0	1

Maximum Marks: 100
(Internal – 30 / External – 70)

Course Objectives:

To enable students to:

- Upgrade their knowledge of basic writing skills, writing cohesive paragraphs and effective letters.
- Differentiate between confusing words, learn correct spellings and have a sound grip over the use of phrasal verbs.
- Master the techniques of reading passages and comprehending them.
- Understand the nuances of technical communication and apply it in their academic and professional career.
- Acquaint themselves with soft skills like having the right attitude towards life and boosting self-confidence.
- Learn the importance of building strong resume and the ways of building it.

CO	Written Communication Skills **(8HC02)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Understand and differentiate different types of listening techniques used to interact with real world problems										3					
CO 2	Differentiate the speech sounds and improve their accent and modulation while speaking										3					
CO 3	Understand and illustrate different word roots,										3					

	word derivatives – synonyms, antonyms and word inflections															
CO4	Discriminate a variety of sentence types, their structure and use punctuations										3					
CO5	Get acclimatized to reading strategies and note making										3					
CO6	Develop proficiency in writing and preparing resume										3					
CO	Overall										3					

Unit: 1

Effective Written Communication:

1.1 Strategies for effective written communication

1.2 Paragraph Writing

1.3 Letter Writing/ E- Correspondence

Unit: 2

Basic writing skills emphasizing Verbal Aptitude:

2.1 Words often confused

2.2 Synonyms – Antonyms

2.3 Homophones, Homonyms, Homographs

2.4 One - word substitutes

2.5 Idioms and Phrases

Unit: 3

Reading Comprehension:

3.1 Skimming and Scanning

3.2 Prediction Techniques and Inferring

3.3 Literal Comprehension

3.4 Evaluative Comprehension

3.5 Inferential Comprehension

UNIT: 4

Technical Communication:

4.1 Definition and Importance of Technical Communication/Business Communication
4.2 Types of Technical Communication and Comprehension
4.3 Report Writing: Significance, types, steps, layout and mechanism
4.4 Review of technical articles

UNIT: 5

Soft Skills:

5.1 Introduction to Soft Skills
5.2 Attitude: Attitude Vs. Behaviour;Factors leading to the formation of AttitudeNegotiation and winning by influence

UNIT: 6

Resume Writing:

6.1Types, purpose and design of Résumé
6.2Differences among Bio-data, Curriculum Vitaé and Résumé
6.3Tips to build a winning Résumé and write and effective cover letter
6.4 Cover Letter

Text book: Compiled by the faculty of English (for internal circulation only).

Reference books:

- English for Professionals by S.S.Prabhakar Rao
- English for Technical Communication by K.R.Lakshminarayana
- English for Business Communication by Dr.T.Farhathullah
- Professional Communication by Alok Jain, PravinS.R.Bhatia and A.M.Sheikh
- Business Communication, Principles to Practice- Monipally.
- Advanced Technical Communication: KavitaTyagi and Padma Mistri

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8AC42**	Electrical Circuits & Networks Analysis	2	1	0	3

Course Objective:

To learn the fundamentals and applications of circuits and networks.

Course outcomes:

1. Understand the principle of different methods of electrical circuit reduction.
2. Understand the principle of single phase A.C circuits.
3. Understand the principle of magnetic circuits.
4. Understand the principles of network theorems along with its applications.
5. Understand the principle two port networks along with its applications.
6. Understand the principle of transients with both DC and AC excitation.

CO	Electrical Circuits & Networks Analysis (**8AC42**)	PO 1	PO 2	PO 3	PO 4	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	PSO 1	PSO 2	PSO 3
CO 1	Understand the principle of different methods of electrical circuit reduction.	3												3		
CO 2	Understand the principle of single phase A.C circuits	2	2											2		
CO 3	Understand the principle of magnetic circuits	2												2		
CO 4	Understand the principles of network theorems along with its application		2											2		

	s															
CO5	Understand the principle two port networks along with its applications	3	2											3		
CO6	Understand the principle of transients with both DC and AC excitation	2	3											3		
CO	Overall	2	2											3		

UNIT – I: INTRODUCTION TO ELECTRICAL CIRCUITS:

Circuit concept, R-L-C parameters, Voltage and current sources, Independent and dependent sources, Source transformation, Kirchhoff's laws, Network reduction techniques, series, parallel, series – parallel, Star- to-delta and Delta-to-star transformation, Mesh Analysis, Nodal analysis, Super mesh, Super node concept.
Applications: For finding of voltage and current of different points of OPAMP circuit.

UNIT – II: SINGLE PHASE A.C. CIRCUITS:

R.M.S and Average values, Form factor for different periodic wave forms, Steady state Analysis of R, L and C (in series, parallel and series-parallel combinations) with sinusoidal excitation.
Resonance in series and parallel circuits, Concept of band width and Q factor.
APPLICATIONS: tuning of a channel in radio receiver.

UNIT – III MAGNETIC CIRCUITS:

Basic terms in Magnetic Circuits, Comparison between electric and magnetic circuits, Composite magnetic circuit, Analysis of series, parallel magnetic circuits, Faraday's Laws of electromagnetic induction, Concept of self and mutual inductance, Dot convention, Co-efficient of coupling.
APPLICATIONS: working of transformer and dc machines.

UNIT – IV: NETWORK THEOREMS:

Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer and Millman's Theorems - statements and problems solving using dependent and independent sources with D.C. excitation.
Applications: For finding of voltage and current of different points of OPAMP circuits.

UNIT – V: TWO–PORT NETWORKS:

Z,Y, ABCD and h-parameters, Conversion of one parameter to another parameter, Condition for reciprocity and symmetry, two port network connections in series, parallel and cascaded configurations, Problem solving.
APPLICATIONS: analysis of electrical transmission network.

UNIT – VI: TRANSIENT ANALYSIS:

Transient response of R-L, R-C, R-L-C series circuits with D.C. and A.C excitations, Initial conditions, Solution using differential equation approach and Laplace transform methods of solutions.
APPLICATIONS: transientanalysis of electrical machines.

TEXT BOOKS:

1. Engineering Circuit Analysis – William Hayt and Jack E Kemmerly, McGraw Hill 5th Edition, 1993.
2. Circuits & Networks – M.S. Sukhija, K.N. Nagasarkar, Oxford University Press, 2nd edition.

REFERENCES:

1. Network Analysis - M.E. Vanvalkenberg, 3rd edition, PHI.
2. Circuit theory (Analysis & Synthesis) – A.Chakravarthy, Dhanpath Rai & Co., 6th edition.
Circuits & Networks – A.Sudhakar and Shyamamohan S.Palli, Tata McGraw Hill, 3rdedition.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8AC61**	Electrical Circuits & Networks Analysis Lab	0	0	2	1

Course Objectives:

To make the student to learn:

i. Verification of network theorems experimentally.
ii. To measure frequency of RLC series and parallel circuits under resonance
iii. To determine self & mutual inductance and co-efficient of coupling for coupled circuits
iv. The construction of current locus diagram for a given parallel circuit.
v. Simulation for analysis of electrical networks
vi. Method for determining the parameters of a coil

Course Outcomes:

At the end of the course, students will be able to

i. Perform the test for verification of various network theorems
ii. Measure the frequency for a RLC series/parallel circuits under resonance.
iii. Conduct an experiment for determination of self & mutual inductance and coefficient of coupling
iv. Construct current locus diagram by performing a test on single phase parallel circuits
v. Simulate for analysis of electrical circuits.
vi. Determine the parameters of the coil

CO	**Electrical circuits and Network Analysis Lab (8AC61)**	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	Perform the test for verification of various network theorems	2	2			2				2				2	1	
CO 2	Measure the frequency for a RLC series/parallel circuits under resonance	2	2			2				2				2	1	
CO 3	Conduct an experiment for determination of self & mutual inductance and	2	2			2				2				2	1	

	coefficient of coupling															
CO4	Construct current locus diagram by performing a test on single phase parallel circuits	2	2			2				2				2	1	
CO5	Simulate for analysis of electrical circuits	2	2			2				2				2	1	
CO6	Determine the parameters of the coil	2	2			2				2				2	1	
CO		2	2			2				2				2	1	

List of Experiments (ANY 10 Experiments to be conducted)

1. Verification Thevenin's Theorem and Norton's Theorem
2. Verification of Maximum Power Transfer Theorem
3. Verification of Superposition Theorem
4. Verification of Compensation Theorem
5. Verification of Reciprocity Theorem and Millmann's Theorem
6. Finding resonant frequency in Series and Parallel circuits
7. Determination of Self Inductance, Mutual Inductance and Coefficient of coupling
8. Calculation of Z and Y Parameters
9. Construction of current locus diagram for RL and RC circuit
10. Mesh and Nodal Analysis by simulation
11. Determination of Average value and RMS value of a complex wave
12. Determination of parameters of a coil.
13. Determination of Time constant of RL and RC series circuit.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8HC66**	Engineering Physics Lab	0	0	2	1

Course Objectives

- Understand the concept of photo electric effect using photo voltaic cell.
- Discuss the dispersive power of prism-minimum deviation method.
- Discussion of diffraction pattern using the grating – LASER.
- To study the concepts (numerical aperture) of an optical fiber.
- To explain about magnetic induction, Biot-Savart principle.
- Study the frequency of AC mains using Sonometer.
- Explaining about the electrical resonance by using the LCR circuit.
- To understand the rigidity modulus, periodicity.
- To discuss the energy gap (E_g) of a semiconductor diode.
- To study the LED characteristics and forward resistance.
- To know the time constant of RC circuit.
- To understand about the ionizing radiation by using the Geiger–Muller counter.

CO	**Engineering Physics Lab (8HC66)**	PO 1	PO 2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	Demonstrate the wave length of monochromatic source of light by using Newton's Rings	3	3													
CO 2	Analyze refractive index of a material prism and Dispersive power of a glass Prism by using spectrometer	3	3													
CO 3	Determine the wave length of spectral light and laser Source of light by using Diffraction Grating	3	3													
CO 4	Design and Analyze RC Circuits	3	3													
CO 5	Analyze RLC Series circuit and parallel	3	3													

	circuit															
CO6	Investigate magnetic Circuits	3	2													
CO		3	3													

List of Experiments

1. Determination the Planck's constant using the photo voltaic cell - Photo voltaic cell.
2. Calculation of dispersive power of a given material of prism by using

Spectrometer in minimum deviation method - Light.

3. Determination of wavelength of a given laser source of light by using diffraction grating in normal incidence method - LASER
4. Determination of a Numerical Aperture (NA) of an optical fiber – Fiber optics.
5. Determination of magnetic induction flux density along the axis of a current carrying circular coil using Stewart and Gee's experiment - Magnetism.
6. Calculating the frequency of AC supply by using the Sonometer – Magnetostriction method.
7. Study of series and parallel resonance of an LCR circuit – Electrical devices.
8. Determination of rigidity modulus of a given wire material using the Torsional pendulum - Vibrations
9. Determination of the energy gap (E_g) of a given semiconductor- Temperature/semiconductor.
10. Studying the characteristics and calculating the forward resistance of a LED – Semiconductor/devices.
11. Determination of time constant of an RC-circuit – Electrical/ Electronics.
12. Studying the characteristics of Geiger–Muller counter and verifying the inverse square law - Nuclear physics

NOTE: Any **TEN** of the above experiments are to be conducted.

Course Outcomes

After completing the experiment, students are able to

- Understand the concepts of photo electric effect, importance, photo current, colour filters, optical sensors (photo voltaic cell).
- Know about the light properties-dispersion, prism, spectrometer and minimum deviation arrangement.
- Recognize the difference between the interference and diffraction, grating, laser characteristics.
- Analyze the concepts of fiber optics, fundamentals, numerical aperture its importance, attenuation in fiber and applications.
- Understand and search to apply the fundamentals of magnetic induction, Ampere's law, Oersted's law and the Biot-Savart law.
- Know the difference between AC and DC fundamentals, Magnetostriction, resonance, air column vibrations.
- Analyze the LCR circuit combination, parallel, series electrical resonance, inductance, reactance, capacitance and electrical and electronic fundamentals.
- Summarize the fundamentals of modulus-types, stress, strain, elasticity, plasticity and Hook's law.

- Analyze the concept a semiconductors, types, calculation of energy gap of a semiconductor diode and importance.
- Analyze the difference between normal diode, LED, forward bias, reverse bias, I-V characteristics, direct and indirect band gap semiconductors.
- Characterize the RC network, time constant, capacitor functioning and its application.

Understand the concept of radiation, ionizing radiation, radiological protection and inverse square law

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8EC61**	Data Structures (C/C++) Lab	0	0	2	1

Course objective:

Understand the data structures: simple and complex and use them to write the programs for implementing searching, sorting, expression evaluations. Understand the applications that use the particular data structure and its significance in the development of operating systems and the softwares . Understand the object-oriented programming concepts of C++.

Course Outcomes:

1. Write programs to implement Stacks, Queues and circularqueues.
2. Write programs using tree traversals. In order, preorder and post order.
3. Write Programs on searching, sorting and hashing operations.
4. Write programs on Binarytrees
5. Write programs in C++ to implement classes and operatoroverloading.

CO	Data Structures (C/C++) Lab (**8EC61**)	PO 1	PO 2	PO 3	PO 4	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	PSO 1	PSO 2	PSO 3
CO 1	Write programs to implement Stacks, Queues and circular queues, tree traversals. Inorder, preorder and post order, earching and sorting operations, Binary trees, C++ to implement classes and operator overloading.	2	3	3												
CO	**Overall**	2	3	3												

UNIT –I:

1. Write a C program that implement stack and its operations usingarrays
2. Write a C program that implement Queue and its operations usingarrays.
3. Write a C program that implement Circular Queue and its operations usingarrays.
4. Write a C program that uses Stack operations to perform thefollowing
   i) Converting infix expression into postfixexpression
   ii) Evaluating the postfixexpression

UNIT –II:

5. Write a C program that uses functions to perform the following operations on singly linkedlist:
   i) Creation ii) Insertion iii) Deletion iv) Traversal

6. Write a C program using functions to perform the following operations on circular singly linkedlist:
   i) Creation ii) Insertion iii) Deletion iv) Traversal

7. Write a C program that uses functions to perform the following operations on doubly linkedlist:
   i) Creation ii) Insertion iii) Deletion iv) Traversal in bothways
8. Write a C program to implement operations on the following Data Structures UsingSingly linkedlist:
   i) Stack ii)Queue

UNIT- III

9. Write a C program that uses functions to perform thefollowing:
   i) Creating a Binary Tree ofintegers
   ii) Traversing the above binary tree in preorder, in order and postorder.

UNIT- IV

10. Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list ofintegers:
    i) Linearsearch ii) Binarysearch

11. Write C programs that implement the following sorting methods to sort a given list of integers in ascendingorder:
    i) Bubblesort ii) Insertion sort iii) SelectionSort

12. Write C programs that implement the following sorting methods to sort a given list of integers in ascendingorder:
    i) Quick sort ii) Merge sort iii) HeapSort

13. Write a C Program to implement Separate Chaining using Hashing. Include Insertion, Deletion and Display of theElements.

UNIT –V

14. Write a C++ program to read and display the details of student class with data members as name, rollno and 3 subjects'marks.

15. Write a C++ program to implement all types ofconstructors.

UNIT VI

16. Write a C++ program to implement operator overloading for addition of two complex numbers.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8HC62**	Written Communication Skills Lab	0	0	2	1

Course Objectives:
To enable students to:

- upgrade their knowledge of basic writing skills, writing cohesive paragraphs and effective letters.
- differentiate between confusing words, learn correct spellings and have a sound grip over the use of phrasal verbs.
- master the techniques of reading passages and comprehend them.
- understand the nuances of technical communication and apply it in their academic and professional career.
- acquaint themselves with the concept of soft skills, having the right attitude towards their education, career and life in general.
- learn the importance of building a strong resume.

Units	Theory (1 per week)	No. of Periods	Lab (2 per week) CS LAB	No. of Periods
1. Elements of effective writing skills	1.1 Use of appropriate words and phrases 1.2 Sentence structures 1.3 Vocabulary: Synonyms – Antonyms Homophones, Homonyms, Homographs, words often confused, One - word substitutes, Idioms and Phrases 1.4 Avoid discriminatory writing	**1** **1** **1**	Exercises on • Words often Confused • Synonyms – Antonyms • Identifying Homophones, Homonyms, Homographs • words often confused • One - word substitutes • Idioms and Phrases	**4**
2.Professional writing skills	2.1 Paragraph writing 2.2 Letter writing (language to be used in a formal letter) 2.3 Leave letter, letter of apology, complaint letters, enquiry letters with replies 2.4 e-correspondence	**1** **1**	Practice exercises on • Paragraph Writing using hints/guided Paragraphs • Writing different types of letters • Learning e-correspondence	**6**
3. Reading Comprehension	3.1 Prediction techniques, Skimming and Scanning 3.2 Literal Comprehension 3.3 Evaluative Comprehension 3.4 Inferential Comprehension	**1** **1** **1**	Practice sessions on • Using passages for skimming and scanning • Reading Comprehension using different techniques	**6**
4. Report Writing	4.1 Significance, types, steps, formats of a report 4.2 Detailed analysis of manuscript of a report 4.3 Language and structure to be used in a formal report	1 1 1	• Practice Writing reports and reviewing technical Articles • formal expressions, technical vocabulary, active voice and passive voice, introduction, body and conclusion of a report	6

5. Resume Writing & Cover Letter	5.1 Types, purpose and design of Résumé 5.2 Differences among Bio-data, Curriculum Vitaé and Résumé 5.3 Methods to build a winning Résumé 5.4 Writing an effective Cover Letter	1 1 1	Practice exercises on • Resume Building • Drafting cover letters	6
6. Technical Communication and Soft Skills	6.1 Technical vocabulary 6.2 Review of technical articles 6.3 Technical research paper writing 6.4 Attitude Vs Behavior in professional circles	1 1	Practice exercises on • Technical vocabulary • Writing articles and research papers • Activities based on Soft skills • Developing attitude and behavior	4

Text book : Compiled by the faculty of English (for internal circulation only).

Reference books: * English for Professionals by S.S.Prabhakar Rao * English for Technical Communication by K.R.Lakshminarayana

- English for Business Communication by Dr.T.Farhathullah
- Professional Communication by Alok Jain, Pravin S.R.Bhatia and A.M.Sheikh
- Business Communication, Principles to Practice- Monipally.
- Advanced Technical Communication: Kavita Tyagi and Padma Mistri

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Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8C262**	Comprehensive Test and Viva –Voce – II	1	0	0	1

Comprehensive Test and Viva Voce	**The subjects studied in the Semester concerned related to branches concerned and for placements**
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks :

*Comprehensive Test : 70 marks
**Viva Voce : 30 marks
Total : 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.
End Semester Examination for Comprehensive Test will be taken for 50 marks.
Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.
End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.
The total for Viva Voce will be 30.

Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.
The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

CO	**Comprehensive Viva Voce-I (7C496)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Assess the relevant courses they have undergone till the completion of that academic year. Comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills. They are asked to comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills. Assessment is done in the relevant courses they have undergone till the completion of that academic year.	3	2								2			3		
CO	Overall	3	2								2			3		

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	**L**	**T**	**P**	**C**
I – II	**8C263**	Technical Seminar - II	1	0	0	1

Course Objective :

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

Course Outcomes: After completing this course, the student will be able to

1. Identify current general, political and technology related topics.
2. Arrange and present seminar in a effective manner
3. Collect, survey and organize content in presentable manner
4. Demonstrate oratory skills with the aid of Power Point Presentations
5. Exhibit interview facing skills and team leading qualities

CO	Technical Seminar – II (**8C263**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Identify current general, political and technology related topics	3	3		2					**2**	1		3	3		3
CO2	Arrange and present seminar in a effective manner .	2	2		2					**2**	3		2	3		3
CO3	Collect, survey and organize content in presentable manner .	1	2		1					**2**	3		1	2		1
CO4	Demonstrate oratory skills with the aid of Power Point Presentations and also submit the report of the Technical seminar	1	3		2					**2**	3		1	2		1
CO5	Exhibit interview facing skills and team leading qualities															
CO	Overall	2	3		2					2	3		2	3		2

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9^{th} week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

Syllabus for B.Tech. I year II Semester
Electronics and Communication Engineering
Orientation Course
(Mandatory course)

Code: 8HC18	**L**	**T**	**P/D**	**C**
Course Objectives:	**2**	**0**	**0**	**0**

This introductory course input is intended

1. To help the students appreciate the essential 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.
2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature. Thus, this course is intended to provide a much needed orientational input in value education to the young enquiring minds.

Course Outcomes: At the end of this course, the student will be able to

7. Learns Being a human, understands human values and purpose of education
8. Understands the importance of different harmony levels needed. Understand Self and being in the current moment are the sources of happiness.
9. Improves Learning capabilities and communication skills.
10. Improves Personality Development and Life Skills
11. Understands and appreciate the importance of personality development and yoga for a holistic life.
12. Understands the essence and Values and Social responsibilities for successful life.

Unit	**Name of the Module**	**Number of Periods**
c) **Orientation Course for B. Tech I year I semester Students – 3 weeks duration covering the following Two Units**		
I	Universal Human Values – Introduction	8
II	Universal Human Values – Relationships	8
d) **Orientation Course for B. Tech I year II semester Students –covering the following Four Units**		
III	Improving Learning Capabilities (ILC) - Basic Skills of Learning	12
IV	Improving Learning Capabilities (ILC)- Personality Development	12

	and Life Skills	
V	Literature , Proficiency Modules(PM) in English, Health, Yoga & Diet, Co-Curricular & Extracurricular activities	12
VI	Lectures by Eminent Persons on Science, Technology & Environment, Research, Innovation & Patents, Local Visit to Village and City including Hi-tech City. Feedback on last but one day of Orientation Course	12
Total Number of Periods		**64**

Unit - I
Universal Human Values

Introduction -Self – Exploration, Basic human aspirations, Need for a holistic perspective, Role of Education, Understanding Happiness, Understanding the human being – Self and Body.

Unit - II
Universal Human Values

Relationships-Understanding Relationship –Trust and Respect.Harmony in the Society, Natural Environment, Participation in nature Harmony in nature/existence.

Unit - III
Improving Learning Capabilities-Basic Skills of Learning

Principles of Learning, Study Skills & E-Learning, Listening Skills, Effective Reading and Reviewing, Reading Comprehension, Textbook Reading Strategies, Test taking strategies, Introduction to Soft Skills and Employability Skills, Interpersonal skills.

Unit - IV
Improving Learning Capabilities-Personality Development and Life Skills

Goal Setting, Motivation, Time Management, Positive Attitude, Decision Making, Building Self-confidence, Attributes of a Good Personality, Memory Management, Characteristics of a successful student, Responsibilities of Students in shaping themselves, Morals, Ethics & Values, Difference between Studying in a Professional College and High School / Junior College

Unit - V

Literature , Proficiency Modules(PM) in English, Health, Yoga & Diet, Co-Curricular & Extracurricular activities

Literature -History of human civilization, Indian civilization, Indus valley civilization and culture, history of religions, the basic tenets of Christianity, Islam, Hinduism, Buddhism, Jainism, Sikkim and Judaism, Indian culture and values.

Proficiency Modules in English - Strategies to improve proficiency in English skills(L/S/R/W), Exercises based on Remedial grammar, Exercises on Remedial Vocabulary

Health- Dimensions of Health, Basic activities of daily living, Instrumental activities of daily living, Types of Health, Factors affecting health

Yoga - Introduction to Yoga, Kinds of Yoga, Pranayama and Dhyana (Meditation)

Diet- Balanced Diet, Components of Diet, Health Eating Pyramid.

Co-curricular andExtra Curricular activities

Unit - VI

Lectures by Eminent Persons, Research, Innovation & Patents and Local Visit

Lectures by Eminent Persons on Science, Technology & Environment,

Innovations R&D and Entrepreneurship-Sreenidhi HUB, Basics of Innovation, Entrepreneurship and Intellectual Property Rights (IPR)

Local Visit to Village and City including Hi-tech City.

Feedback on last but one day of Orientation Course

Text Books:

1. RR Gaur, R Sangal, GP Bangaria, 2009, A Foundation Course in Value Education (English).

Reference Books:

1. Yoga, Food and Health (by Swami GurupremanandaSaraswati)

II - I

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8CC01**	Electronic Devices and Circuits	3	0	0	3

Course Objectives

- To provide the learners a comprehensive understanding of electronic Components like Diodes, Transistors, Field Effect transistors and their applications.
- To maintain the right blend of theory and practice in analyzingand designing of Amplifiers and Oscillators.

Course Outcomes

After studying this course, the students will be able to

[CO1] Demonstrate the concepts of pn Diode, Zener Diode, Bipolar Junction Transistor, Field Effect Transistor and their characteristics.
[CO2] Design and Analyze the Amplifier circuits usingBJT and FET.
[CO3] Classify and characterize the Feed Back amplifiers and design various Oscillator circuits.
[CO4] Understand the Basic regulator circuits and voltage multipliers.

CO	**Electronic Devices and Circuits (8CC01)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Understand the operation of semiconductor diode	3												1		
CO2	Understand the Fundamentals of BJT operation,	2	2											1		
CO3	Understand the Fundamentals of SCR, JFET operation .	3	2	1										2		
CO4	Understand the Analysis and design of Amplifier and Oscillators	2	2	2										2		
CO5	Understand the Basic	2	2	3										2		

	regulator circuits and voltage multipliers. .															
CO6	Explore the various number systems	1	2	1									2			
CO	Overall	2	2	2									2			

UNIT-I

PN JUNCTION DIODE: [CO1][T1][Lecture hrs – 10]
P-N Junction diode characteristics and applications under forward & reverse bias. Transition capacitance and Diffusion capacitance. Break down of junctions (Avalanche Break Down and Zener Break down). Zener Diode Characteristics.
P-N junction diode as a Rectifier :Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Analysis of Rectifier circuits without and with filters (Inductor and Capacitor Filters).

UNIT- II

BIPOLAR JUNCTION TRANSISTOR:[CO1][T1][Lecture hrs – 10]
Fundamentals of BJT& Operation, Minority carrier profiles. I/P and O/P Characteristics CB, CE and CC configurations.Transistor as a switch. Switching characteristics (Rise time, Fall time, Delay Time and Storage time), Design of transistor as switch. Problems on transistor switch. BJT Biasing Methods & Stabilization. - Fixed Bias, Collector to Base Bias, Voltage Divider Bias and Problems, Concept of Thermal runway in BJT.

UNIT-III

Small signal & High frequency analysis of BJT:[CO2][T1][Lecture hrs – 8]
Small signal Low frequency Model of BJT, h-parameter representation – Exact analysis of .CE Amplifier-.Approximate analysis of CE, CB and CC Amplifiers. Concept of Multistage amplifier - N-stage cascaded amplifier, equivalent circuits, Frequency response of single & two stage RC coupled Amplifier, Analysis at Low and High frequencies.
Hybrid π model – relationship between high frequency parameters and h- parameters, β cut off Frequency (common Emitter short circuit Current gain), Millers Theorem.

UNIT-IV

FIELD EFFECT TRANSISTOR:[CO1][CO2][T1] [Lecture hrs – 9]
Construction & Working of JFET, JFET characteristics, FET Parameters, Construction & Working of MOSFET, MOSFET characteristics,(Enhancement and depletion mode); Comparison of JFET & MOSFET
Biasing of JFET - Self bias and fixed bias. Small signal Analysis of common source, common drain and common gate amplifier configurations

UNIT- V [CO3] [T1][Lecture hrs – 8]

FEED BACK AMPLIFIERS

Fundamentals-classification- Characteristics of feedback Amplifier effect of feedback in voltage series, voltage shunt, current series and current shunt amplifiers. Problems

OSCILLATORS

Classification of Oscillators. Condition for Oscillations. RC Phase shift Oscillator , Wein bridge oscillator- Hartley oscillator, Colpitts oscillator, Quartz crystal Oscillator,

UNIT-VI

VOLTAGE REGULATORS:[CO4][T1][T2][Lecture hrs – 9]

Classification of Voltage Regulators - Basic regulator circuit: Zener, Transistor Based: Shunt and Series Voltage regulators. Protection Circuits: Current limiting, Short circuit protection. Specifications of Voltage regulator, Voltage multipliers. Switching Regulators – (boost up, step down (buck) &Flyback)

Text Books

[T1]Electronic Devices and Crcuits-J.Millman, C.C.Halkias and satyabrathajit Tata McGraw Hill,2 Ed. 2007

[T2]Electronic Devices AND Circuits-R.L.Boylestad&LouisNashelsky, Pearson/Prentice Hall, 9th edition, 2006.

References

[R1]Electronic circuit analysis-K.Lal Kisshore,2004,BSP

[R2] Electronic Devices and Circuits by S.Salivahanan and N.Suresh Kumar, Tata Mc Graw Hill Publications

[R3] Electronic Devices and Crcuits by Sanjeev Guptha,Dhapat Rai Publications.

[R4] Electronic Devices and Circuits – K.LalKishore, 2 ed., 2005, BSP

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8CC02**	Digital Logic Design (Common to ECE/ECM/EEE)	2	0	0	2

COURSE OBJECTIVES:

To learn the different numbering systems, Boolean functions and design of Combinational circuits

To learn design of Sequential Circuits, design using PLDs and digital controllers using Algorithmic State machines

COURSE OUTCOMES:

After completing this course, the students will have demonstrated

[CO1]. An ability to understand number systems and apply the rules of Boolean algebra and K-maps to simplify Boolean expressions.

[CO2]. An ability to design MSI combinational circuits such as full adders, multiplexers, decoders, encoders.Code converters.

[CO3]. An ability to design basic memory units (latches and flip-flops) and sequential circuits such as counters and registers

[CO4]. An ability to design digital design using PLD's such as ROM's, PLA's, PALs and digital controllers using Algorithmic State Machine Charts.

CO	**Digital Logic Design (8CC02)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	An ability to understand number systems and apply the rules of Boolean algebra	2	2	2	2									3		
CO2	An ability to simplify of Boolean expressions using K-map	1	2	2	2									3		
CO3	An ability to design MSI combinational circuits	2	2	2	2								2	3		
CO4	An ability to	2	2	2	2								2	3		

	design basic memory units															
CO5	An ability to design digital design using PLD's such as ROM's, PLA's, PALs.	1	2	2	2								2	3		
CO6	An ability to design digital controllers using Algorithmic State Machine Charts.	1	2	2	3								2	3		
CO	Overall	2	2	2	2								2	3		

UNIT – I[Lecture hrs – 9]

Number System: Binary, decimal, octal, hexa decimal, weighted and un-weighted codes.

Boolean Algebra: Axiomatic definition of Boolean algebra, Binary operators, postulates of and theorems. Boolean addition, subtraction, 1's complement, 2's complement. Switching functions, Canonical forms and Standard forms, Simplification of switching functions using theorems.

UNIT – II[Lecture hrs – 8]

Logic gates: Basic gates and universal gates.

Minimization of Switching Functions: simplification rules, Karnaugh map method, Prime implicants, don't care combinations, Minimal SOP and POS forms, Quine-McCluskey Tabular Method, Prime Implicant chart.
Application: Design of a Basic Calculator Using Logic Gates.

UNIT – III[Lecture hrs – 9]

Combinational Logic Design:
Single output and multiple output combinational logic circuit design, AND-OR, OR-AND, and NAND/NOR realizations, Exclusive-OR and Equivalence functions, Binary adders/subtractors, Encoder, Decoder, Multiplexer, Demultiplexer, MUX realization of switching functions, Parity bit generator, Code-converters, Concepts of threshold logic and threshold gates.
Applications: Application of Decoder in Seven Segment Display, application of Encoders in Servomotors.

UNIT - IV [Lecture hrs – 9]

Sequential Circuits-1:
Classification of sequential circuits (Synchronous, Asynchronous Pulse mode, and Level mode with examples).Basic flip-flops-Triggering and excitation tables.Conversion of flip-flops.
Applications: Application of SR Flip Flop in Switch Debounce Circuit.

UNIT – V[Lecture hrs – 9]

Sequential Circuits-2:

The sequential circuit model, Asynchronous counters, Design of simple synchronous sequential circuits such as counters (Design of modulo-N counter, Ring counter, twisted ring counter) and Shift registers
Applications: Design of 1010 sequence detector, Design of Digital Clock using Counters

UNIT – VI[Lecture hrs – 9]

Programmable LogicDevices:
Basic PLD's-ROM, PROM, PLA, and PLD Realization of Switching functions using PLDs. Algorithmic State Machines: State machines and state diagrams.
Applications: Design of a Weighing machine and Binary multiplier.

Text Books:

[T1]. Morris Mano-,Digital design –PHI, 2nd Edition.

[T2}. ZviKohavi and Niraj K Jha -Switching & Finite Automata theory – Cambridge, 3rd Edition.

References:

[R1]. Fletcher -An Engineering Approach to Digital Design – PHI.

[R2]. Fundamentals of Logic Design, Roth, Kenny, Seventh Edition, Cengage Learning

[R3]. R.P.Jain-Switching Theory and Logic Design- TMH Edition,2003.

[R4]. CVS Rao -Switching Theory and Logic Design –Pearson Education, 2005

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8CC03**	Signals and Systems (Common to ECE/ECM)	3	0	0	3

Pre Requisites: Mathematics-Integration, Differentiation and basic representation of Laplace & Z Transforms

Course Objectives :

To study the concepts of signals and systems their characterization in the Time as well as frequency domains

To know the importance of sampling theorem and various sampling methods to convert continuous time signals into discrete time signals

COURSE OUTCOMES:

After studying this course, the students will be able to

1. Understand the concepts of signals, comparison of signals, orthogonal signal space and Apply the orthogonality properties to understand the Fourier methods of signal analysis-Fouries series and Fourier Transforms.
2. Understand the concepts of systems, their characterization in the Time as well as Transformed domains and apply the mathematical tools, such as Convolution, Correlation and the Laplace transform to analyze signals and systems.
3. Determine the sampling frequency for any low pass and band pass signals applying the sampling theorem.
4. Distinguish between continuous and Discrete time signals and systems. Apply the concepts of Z-Transforms in the analysis of DT signals and systems.

CO	**Signals and Systems (8CC03)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Understand the concepts of signals, comparison of signals	2	2	2									2	3		
CO2	Apply the orthogonality properties to understand Fouries series and Fourier Transforms .	2	2	2									2	2		
CO3	Understand the concepts of systems, their characterization in the Time as well as Transformed domains	2	2	2									2	2		

CO4	Understand and apply the mathematical tools	2	2	2									2	2		
CO5	the sampling frequency for any low pass and band pass signals applying the sampling theorem.		2	3									2	2		
CO6	Distinguish between continuous and Discrete time signals and systems. .	2	2	2									2	1		
CO	Overall	2	2	2									2	2		

UNIT I[Lecture hrs – 9]

Signals: Signals. Classification of Signals.Even, Odd, Periodic.Non-periodic.Energy and Power Signals.Exponential and Sinusoidal Signals.Concepts of Impulse Function.Unit Step Function. Signum Function. [T1, T2]
Signal Analysis - Analogy between Vectors and Signals. Orthogonal Signal Space. Signal Approximation using Orthogonal Functions. Mean Square Error. Closed or Complete Set of Orthogonal Functions.Orthogonality in Complex Functions. [T1, T2]

Applications: The concepts of orthogonality find applications in DSP, DIP, DC, Design of experiments and so on.

UNIT-II[Lecture hrs – 10]

Fourier Representation of Continuous Time Signals

Periodic Signals- Fourier Series, Dirichlet's Conditions.Trigonometric.Exponential Fourier series. Fourier Spectrum.[T2]

Non- Periodic Signals - Fourier Transforms. Fourier Transform of Arbitrary Signal. Standard Signals. Fourier Transform of Periodic Signals. Properties of Fourier Transforms. Fourier Transforms Involving Impulse and Signum Function Introduction to Hilbert Transform. [T1, T2]

Applications: Knowledge of signal bandwidth is necessary in the design of a filter; in the determination of the carrier frequency and also the sampling frequency and analog communication.

UNIT-III[Lecture hrs – 11]

Signal Transmission through Linear Systems
Systems.Classification of Systems.Linear System.Impulse Response (IR) of a Linear System.Linear Time Invariant (LTI) System.Linear Time Variant (LTV) System. Transfer Function of a LTI System. Filter Characteristics of Linear Systems. Distortion Less Transmission Through a System. Signal Bandwidth. System Bandwidth.Ideal LPF, HPF and BPF Characteristics.Causality and Poly-Wiener Criterion for Physical Realization. Relationship between Bandwidth and Rise Time.[T2]

Applications: The concept of system bandwidth is applied in the design of a practical filter or system.

UNIT-IV[Lecture hrs – 11]

Convolution and Correlation of Signals
Concept of Convolution in Time Domain and Frequency Domain.Graphical Representation of Convolution.Convolution Properties. Cross Correlation and Auto Correlation of Functions. Properties of Correlation Function, Relation between Convolution and Correlation.Energy Density Spectrum, Parseval's Theorem, Power density spectrum, Detection of periodic signals in the presence of Noise by Auto and Cross Correlations.[T2]

Laplace Transforms - Review of Laplace Transforms. Partial Fraction Expansion. Inverse Laplace Transform. Concept of Region of Convergence (ROC) for Laplace Transforms. Constraints on ROC for Various Classes of Signals.Properties of LT.Initial and final value theorems, Relation between LT and FT of a Signal. Laplace Transform of Certain Signals using Waveform Synthesis. Laplace Transform of Periodic Signals.[T1, T2]

Applications: These math tools are required in the design, analysis and implementation of various filters, LT signals and systems.

UNIT-V[Lecture hrs – 9]

Sampling
Sampling Theorem.Graphical and Analytical Proof for Band Limited Signals.Impulse (Ideal) Sampling.Natural (Chopped) Sampling and Flat Top(S&H) Sampling.Reconstruction of Signal from its Samples.Effect of Under Sampling.Aliasing. Introduction to Band Pass Sampling.[T1, T2]

Applications: Sampling techniques are applied in the conversion of analog to digital conversion

UNIT-VI[Lecture hrs – 8]

Z–Transforms
Fundamental Difference between Continuous and Discrete Time Signals. Discrete Time Signal Representation using Complex Exponential and Sinusoidal Components. Periodicity of Discrete Time using Complex Exponential Signal.Concept of Z- Transform of a Discrete Sequence. Distinction Between Laplace, Fourier and Z Transforms. Region of Convergence in Z-Transform.Constraints on ROC for Various Classes of Signals.Inverse Z-Transform.Properties of Z-Transforms.Initial and final value theorems.Introduction to Discrete Time Systems. [T2]
Applications: Analysis and Synthesis of DT signals and systems.

Text Books

1. Signals, Systems and Communications- B. P. Lathi, BSPublications.
2. Signals and Systems – Anand Kumar, 2nd Edition, PHI Publications.

References

1. Signals & Systems – Simon Haykin and Van Veen, 2nd Edition, WileyPublications.
2. Signal processing and Linear Syustems - B. P. Lathi, BSPublications.
3. Signals & Systems -A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2ndEdn, PHI Publications.
4. Linear Systems and Signal Processing - B. P. Lathi, Oxford University Press.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8C304**	Probability Theory and Stochastic Process	2	1	0	3

Course Objectives

- To establish basic foundations on the concepts of probability theory, random variables, random processes and statistical averages.
- To acquaint the learners with the applications of random variables and random processes, in communication systems.

Course Outcomes

After studying this course, the students will be able to

[CO5] Explore the concepts of Probability of Random Events, Joint, Marginal, Conditional and Total Probabilities, Bayes Theorem.

[CO6] Understand the concepts of probability distribution and probability density functions, their properties for single and multiple random variables. Also characterize various statistical averages based on probability density function.

[CO7] Analyze the different types of random processes, their statistical parameters such as Auto-correlation function, Power Density Spectrum.

[CO8] Characterize the response of LTI systems to random processes and explore the applications of probability in Information theory.

CO	**Probability Theory and Stochastic Process (8C304)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Understand the concepts of Probability, Understand concepts of multiple random variables,	3	2											3		1
CO 2	Understand concepts of Discrete Random Variables	3	2											3		1
CO 3	Understand concepts of multiple random variables	2	3	1										1		1

CO4	Understand concepts ofthe.Mean. Auto-correlation, Auto-covariance and Auto-correlation	2	3	1										2		
CO5	Understand the concepts of Power Spectral Density Function of Random Process,	1	2	2	3									2		
CO6	Understand the concepts of Random Signal Response of Linear Systems	2	1	3	2									2		
CO	Overall	2	2	2	3									2		1

UNIT I[Lecture hrs – 10]

PROBABILITY THEORY [T1] [CO1]
Set Definitions.Sample Points and Sample Spaces.Probability of Random Events.Laws of Probability. Joint,Marginal and Conditional Probabilities. Total Probability. Bayes Theorem. Statistical Independence.

Applications. Bayes theorem in calculation of channel capacity, Information Theory i.e., Entropy, Mutual information (rate at which source generates information)

UNIT-II[Lecture hrs – 8]

RANDOM VARIABLES [T1] [CO2]
Probability Distribution Functions.Discrete Random Variables and Probability Mass Function.Expected values.Continuous Random Variables.Probability Density Functions.Complex Random Variables. Moments and Characteristic Functions. Distributions and Density Functions and their Properties.Expected Values. Moments and Characteristic Functions – Binomial. Poisson.Uniform.Gaussian.Exponential. Rayleigh. Transformations of Random Variables.
Applications : Design of queue for Tele communications using Binomial, Poisson distributions.

UNIT-III[Lecture hrs – 8]

RANDOM VECTORS [T1] [CO2]
Joint Probability Distribution Functions.Joint Probability Densities.Conditional Probability Distributions Functions.Marginal Distributions and Density Functions.Conditional Probability Densities.Expected Value of a Function of Random Variables.Joint Moments. Joint Characteristic Functions. Sum of Two RandomVariables.Sum of Several Random Variables.central limit theorem (proof not expected)Jointly Gaussian Random Variables. Independent Random Variables.Transformations (Functions) of Multiple Random Variables.
Applications :design of optimum filter,

UNIT-IV[Lecture hrs – 10]

RANDOM PROCESSES [T1] [CO3]
Definition: The concept. Probabilistic Structure.Classification.Formal Definition. Description: Joint Distribution. Analytical Description using Random Variables. Average Values: Mean. Auto-correlation, Auto-covariance and Auto-correlation Coefficient. Two or More Random Processes: Cross-correlation Function. Cross-covariance Function.Cross-correlation Coefficient.

Applications: Calculation Coding efficiency ofShanonFano Coding.

UNIT-V[Lecture hrs – 9]

STATIONARITY AND CORRELATION THEORY [T1] [CO3]
Strict-sense Stationarity. Wide-sense Stationarity (WSS). Auto-correlation Function of Real WSS Random Process and its Properties.Cross-correlation Function and its Properties.Power Spectral Density Function of a WSS Random Process and its properties.Wiener-Khinchine Theorem.Power and Bandwidth Calculations. Cross-power Spectral Density Function and its Properties
Time Averaging and Ergodicity: Time Averages – Interpretation. Mean and Variance. Ergodicity.General Definition.Mean-ergodic. Correlation -ergodic.

Applications: Removal of noise using correlation, probability of error in Digital Communications.

UNIT-VI[Lecture hrs – 9]

LINEAR SYSTEMS WITH RANDOM INPUTS [T2] [CO4]
Value of System Random Signal Response of Linear Systems: System Response – Convolution. Mean and Mean-squared Response. Autocorrelation Function of Response.Cross-Correlation Functions of Input and Output.Spectral Characteristics of System Response.Power Density Spectrum of Response.Cross-Power Density Spectrums of Input and Output.Band Pass. Band-Limited and Narrowband Processes. Properties.Thermal Noise. Shot noise.
Information Theory: Entropy, Joint Entropy, Conditional Entropy and Mutual Information

Applications– Modulation,SNR calculations.

Text Books

[T1] Peyton Z. Peebles Jr., Probability, Random Variables and Random Signal Principles, 4th edn., Tata McGraw-Hill, New Delhi, 2002.
[T2] R.P.Singh, S.D.Sapre, Communication Systems; Analog and Digital, Tata McGraw Hill, New Delhi, 3rd Ed, 2012.

References

[R1] G. R. Grimmett, D. R. Stirzaker, Probability and Random Processes, Second Edition, Oxford Science Publications, 1995.
[R2] Hwei HSU, Probability, Random Variables & Random Processes, Schaum's Outlines, TMH, 2009
[R3] Athanasios Papoulis, S.Unnikrishna Pillai, Probability, Random Variables and Stochastic Process , PHI, 4th Edition, 2002

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8HC14**	Transform Techniques and Numerical Methods (Common to ECE & EEE)	2	1	0	3

Pre Requisites: Engineering Mathematics – II

Objectives: The students are expected to learn

- Concept, properties of Laplace transforms
- Solving ordinary differential equations using Laplace transforms techniques.
- Various methods to the find roots of an equation.
- Concept, properties of Z-Transforms, Solving Difference equations using Z-Transforms.
- Form partial differential equations and find the solution to first order linear and nonlinear partial differential equations.
- Applications of PDE.
- Concept of finite differences and to estimate the value for the given data using interpolation.
- Evaluation of integrals using numerical techniques
- Solving ordinary differential equations using numerical techniques.

Course outcomes

After learning the contents of this paper the student must be able to

- Use the Laplace transforms techniques for solving ODE's
- Use the Z-Tranforms technique for solving Difference equations
- Form partial differential equations and find the solution to first order linear and nonlinear partial differential equations.
- Find the root of a given equation.
- Estimate the value for the given data using interpolation
- Find the numerical solutions for a given ODE's

CO	**Transform Techniques and numerical methods (8HC14)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	*Use the Laplace transforms techniques for solving ODE's*	3	3	3		3								3	2	

CO2	*Use the Z-Tranforms technique for solving Difference equations*	3	3	3		3								3	2	
CO3	*Form partial differential equations and find the solution to first order linear and nonlinear partial differential equations*	3	3	3		3								3	2	
CO4	*Find the root of a given equation*	3	3	3		3								3	2	
CO5	*Estimate the value for the given data using interpolation*	3	3	3		3								3	2	
CO6	*Find the numerical solutions for a given ODE's*	3	3	3		3								3	2	
CO	OVERALL	3	3	3		3								3	2	

Syllabus

UNIT - I

Laplace Transformations:

Laplace transform of standard functions, shifting theorems, change of scale property, Laplace Transform of Derivatives and Integrals, Multiplication by powers of 't', Divison by 't' (without proofs). Laplace transform of unit step function, Impulse function. Inverse Laplacetransforms**:** properties, partial fraction method and convolution theorem (without proof). Solving ordinary differential equations with constant coefficients using Laplace Transforms.

UNIT – II

Z- Transforms:

Z- Transforms and Inverse Z-transforms, properties, damping rule, Shifting properties, Initial and final value theorems Convolution theorem (without proofs). Applications-Solution of difference equation by Z- transforms

UNIT– III

Partial Differential Equations:

Formation of Partial Differential Equations by Elimination of Arbitrary Constants and Arbitrary Functions. Solutions to First order Linear and Non-linear Equations-Standard Forms, Equations Reducible to Standard Forms. Classification of partial differential equations.Method of Separation of Variables, Solution of One dimensional Heat Equation.

UNIT- IV

Solution of algebraic and transcendental equations and Numerical integration:

The Bisection Method – The Method of False Position –Fixed point iteration Method – Newton-Raphson Method. Newton-Cotes Quadrature Formula, Trapezoidal rule – Simpson's 1/3 rule – Simpson's 3/8 rule.

UNIT – V

Interpolation:

Introduction– Finite differences- Forward Differences, Backward differences, Central differences. Newton's formulae for interpolation – Gauss Central Difference Formulae (without proofs), Lagrange's Interpolation formula for unevenly spaced points.

UNIT – VI

Numerical solution of Ordinary Differential equations:

Solution by Taylor's series – Picard's Method of successive Approximations – Euler's Method – Runge-Kutta Methods of fourth order, Predictor-Corrector Methods-Milne's Method.

Text Books:

(i) R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.
(ii) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
(iii) S. S. Sastry, Introductory methods of numerical analysis. PHI, 4th Edition, 2005.

Reference Books:

(i) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11thReprint, 2010.
(ii) Engineering Mathematics, Srimanta Pal, OXFORD university press.
(iii) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
(iv) Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8HC17**	Universal Human Values (Common to CSE, ECE &CE)	2	1	0	3

Human Values Courses

This course also discusses their role in their family. It, very briefly, touches issues related to their role in the society and the nature, which needs to be discussed at length in one more semester for which the foundation course named as "H-102 Universal Human Values 2: Understanding Harmony" is designed which may be covered in their III or IV semester. During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.

OBJECTIVE

The objective of the course is four fold:

1. Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

COURSE TOPICS: The course has 28 lectures and 14 practice sessions in 5 modules:

Module 1

Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario

Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

Module 2

Understanding Harmony in the Human Being - Harmony in Myself!

1. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'
2. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility
3. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)
4. Understanding the characteristics and activities of 'I' and harmony in 'I'
5. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail
6. Programs to ensureSanyam and Health. Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Module 3

Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

1. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship
2. Understanding the meaning of Trust; Difference between intention and competence
3. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship
4. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals
5. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.

Module 4

Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

Module 5

Implications of the above Holistic Understanding

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Module 6

Harmony on Professional Ethics

25. Competence in professional ethics:
    a. Ability to utilize the professional competence for augmenting universal human order
    b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,
    c. Ability to identify and develop appropriate technologies and management patterns for above production systems.
26. Case studies of typical holistic technologies, management models and production systems
27. Strategy for transition from the present state to Universal Human Order:
    a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers
    b. At the level of society: as mutually enriching institutions and organizations
28. Sum up

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. to discuss the conduct as an engineer or scientist etc.

3. READINGS

3.1 Text Book

a) Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010 3.

b) Reference Books

1. JeevanVidya: EkParichaya, A Nagaraj, JeevanVidyaPrakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.
3. The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj - PanditSunderlal
9. Rediscovering India - by Dharampal

10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8HC03**	Soft Skills (Common to CSE, ECE, CIVIL)	1	0	2	2

Course objectives:

To enable students to:

- Make self-assessment.
- Know the importance of certain soft skills like time management, goal setting and etiquette so that they can make their mark in their career and life in general.
- Sharpen their verbal ability to handle the competitive exams.
- Enhance their team skills and design thinking capabilities for effective problem solving and decision making.
- Know their emotional information which guides their thinking, behavior and helps them manage stress efficiently.
- Equip themselves with the prerequisites, and the relevant techniques to effectively tackle the corporate interview process in vogue.

UNIT:1

Know Yourself:

1.1 Importance of knowing yourself
1.2 SWOT / SWOC Analysis
1.3 SWOT / SWOC Grid

UNIT: 2

Soft Skills III:

2.1 Time management
2.2 Goal Setting

UNIT: 3

Verbal Aptitude:

3.1 Reading Comprehension:Strategies to comprehend difficult passages from a book
3.2 Word Analogies
3.3 Spotting Errors
3.4 Sentence Completion / Sentence Equivalence

UNIT: 4

Skills to excel:

4.1 Team work and Team Dynamics -Collaboration and Leadership
4.2 Decision Making, Design Thinking,Critical thinking and Creative Problem Solving
4.3 Agile project/ Product life cycle management, Creativity and Innovation, Empathy, Customer centricity

UNIT: 5

Self-Management Skills:

5.1 Emotional Intelligence
5.2 Stress Management

UNIT: 6

Interview Skills:

6.1 Interview Skills: Meaning and Purpose of an Interview
6.2 Types of interviews; Interview Preparation techniques
6.3 Dress code at an interview
6.4 FAQs in HR Interview

Text Book: SOFT SKILLS – Dr. K. Alex, S. Chand publications

Suggested Readings:

- SOFT SKILLS – Meenakshi Raman ;
- Word Power made Easy – Norman Lewis
- Objective English - Pearson's Publications
- Skill Sutras- JayashreeMohanraj
- The Power of Soft Skills – Robert A. Johnson
- Soft Skills for Everyone – Jeff Butterfield

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8CC71**	Electronic Devices and Circuits Lab (Common to ECE/ECM/EEE)	0	0	2	1

Course Objectives:

This course introduces the characteristics and applications of semiconductor devices; emphasis is placed on characteristics and testing practically to strengthen the knowledge.

Course Outcomes:

After studying this course, the students will be able to

1. Understand color coding, operations on Diode, BJT, FET and other electronic components.
2. Correlate theoretical concepts with practical implementation.
3. Apply the knowledge of Diodes, Capacitors and Transistors for the realization of rectifiers, regulators, amplifiers and Oscillator circuits.
4. Adapt effective Communication, presentation and report writing skills

CO	**Electronic Devices & Circuits Lab (8CC71)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Identify, Specify and test R, L, C Components (Colour Codes), Potentiometers, Switches, Coils, Relays		1		3					2				2		
CO 2	Identify, Specify and test Active Devices, Diodes, BJTs, Low power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, SCR, UJT	1	2		3					2				2		
CO 3	Describe operation of Multimeters, Function Generator and Regulated Power Supplies	1	1		3					2				2		
CO 4	Explain and use CRO for experiments	1	2	2	3					2				2		

CO5	Explain and demonstrate working of PN Junction diode characteristics	2	2	2	3					2				2		
CO6	Explain and demonstrate working Half and Full wave Rectifier with and without filters	2	2	2	3					2				2		
CO	**Overall**	1	2	2	3					2				2		

PART A

Electronic Workshop Practice (in 3 lab sessions):

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Bread Boards.
2. Identification and Specifications of Active Devices like Diodes, BJTs and JFETs.
3. Study and operation of
    - Digital Multimeters
    - Function Generator
    - Regulated Power Supplies
    - Soldering
    - SMD components

PART B

(For Laboratory examination – Minimum of 10 experiments)

1. Study and Operation of CRO:Oscilloscope, CRT features, vertical amplifiers, horizontal deflection system, sweep, trigger Pulse, delay line, probes for CRO, Measurement of amplitude and frequency. Time Period measurement, Lissajous patterns.
2. Determination of Cut-in Voltage, Forward and Reverse resistances of PN Junction diode usingV-I Characteristics.
3. Zener diode characteristics and Zener as voltage Regulator.
4. Input and output characteristics of BJT in CB Configuration.
5. Input and output characteristics of BJT in CE Configuration.
6. Half wave rectifier with and without filters.
7. Full wave rectifier (Center trapped and Bridge) with and without filters.
8. Drain and Transfer characteristics of FET in CS Configuration.
9. Common Emitter Amplifier Characteristics
10. Common Collector Amplifier Characteristics (Emitter Follower).
11. FET amplifier (Common Source).
12. RC Phase Shift Oscillator.

Major Equipment required for Laboratories:

1. Regulated Power Suppliers, 0-30V
2. 20 MHz, Dual Channel Cathode Ray Oscilloscopes.
3. Functions Generators-Sine and Square wave signals
4. Multimeters
5. Electronic Components

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8CC72**	Basic Simulation Lab (Common to ECE/ECM)	0	0	2	1

Course Objectives:

The objective of this lab is to generate continuous and discrete signals and analyze systems with various signals.

Course Outcomes:

After studying this course, the students will be able to

1. Basic operations on matrices
2. Generate various signals and systems.
3. To simulate operations on signals and systems.

CO	**Basic Simulation Lab (8CC72)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Perform basic operations on Matrices, 1D signals and sequences	1	2			1				2				2	2	
CO 2	Understand convolution correlation of signals and sequences in time and frequency domains	2	2			1				2				2	1	
CO 3	compute the response of LTI system for unit impulse and step	2	2			1				2				2	2	
CO 4	verify the sampling theorem and Gibbs Phenomenon	1	2			1				2				1		
CO	Overall	2	2			1				2				2	2	

SYLLABUS CONTENT

1. Basic Operations on Matrices

2. Generation of Various signals and sequences (Periodic and Aperiodic) such as Unit Impulse, Unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sinc

3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.

4. Finding Even and Odd parts of a Signal/Sequence and Real and Imaginary Parts of a Signal.

5. Convolution of Signals and Sequences.

6. Auto Correlation and Cross Correlation of Signals and Sequences

7. Computation of unit sample, unit step and sinusoidal response of the given LTI system and
8. Computation of unit sample, unit step and sinusoidal response of the given LTI system and verifying its physical realiazability and stability properties.

9. Gibbs Phenomenon.

10. Sampling Theorem Verification.

11. Locating the Zeros and Poles and Plotting the Pole-Zero maps in the S-Plane and Z-Plane for the given transfer function.

12. Verification of Linearity and Time Invariance Properties of a given Continuous / Discrete System

13. Generation of Gaussian noise (Real and Complex), Computation of its Mean, Mean Square Value and its Skew, Kurtosis, and PSD , Probability Distribution Function.

14. Finding the Fourier transform of the signal using Fast Fourier Transform

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8CC73**	Digital Logic Design Lab	0	0	2	1

Course Objectives:

The objectives of this course are

- To Design and analyze the various circuits and systems using Digital ICs.

Course Outcomes:

After studying this course, the students will be able to

- Verify the operations of digital circuits using ICs

CO	**Digital Logic Design Lab (8CC73)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	*Verify the operations of digital circuits using IC s*	3	3	3	3	3				2			2	3	3	2
CO	Overall	3	3	3	3	3				2			2	3	3	2

Syllabus Content

Verify the operations of the Digital ICs (Hardware) in the Laboratory

1. Realization of A-O-I Gates using Universal gates
2. Implementation of 4-Bit binary to Gray code converter
3. Implementation of 4-bit parity generator and checker
4. Verification of 4-bit Binary Adder using IC 74x283
5. Realization of 4x1 Multiplexer and 1x4 Demultiplexer
6. Verification of 3x8 Decoder using IC 74x138
7. Verification of Priority encoder using 74x148
8. Verification of D Flip-Flop IC 74x74
9. Conversion of JK-Flipflop to D-Flipflop
10. Verification of Decade counter using IC74x90
11. Implement 4-bit Ring Counter
12. Verification of Universal Shift Register

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8C364**	Comprehensive Test and Viva –Voce – III	1	0	0	1

Comprehensive Test and Viva Voce	**The subjects studied in the Semester concerned related to branches concerned and for placements**
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

CO	**Comprehensive test and Viva Voce-II (8C364)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Assess the relevant courses they have undergone till the completion of that academic year. Comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills. They are asked to comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which	3	2								2			3		

	improve their employability skills. Assessment is done in the relevant courses they have undergone till the completion of that academic year.															
CO	Overall	3	2								2			3		

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks :

*Comprehensive Test : 70 marks
**Viva Voce : 30 marks
Total : 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.
End Semester Examination for Comprehensive Test will be taken for 50 marks.
Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.
End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.
The total for Viva Voce will be 30.

Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.
The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – I	**8C365**	Technical Seminar – III	1	0	0	1

Course Objective :

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

Course Outcomes: After completing this course, the student will be able to

1. Identify current general, political and technology related topics.
2. Arrange and present seminar in a effective manner
3. Collect, survey and organize content in presentable manner
4. Demonstrate oratory skills with the aid of Power Point Presentations
5. Exhibit interview facing skills and team leading qualities

CO	Technical Seminar III (**8C365**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Identify current general, political and technology related topics	3	3		2					**2**	1		3	3		3
CO2	Arrange and present seminar in a effective manner .	2	2		2					**2**	3		2	3		3
CO3	Collect, survey and organize content in presentable manner .	1	2		1					**2**	3		1	2		1
CO4	Demonstrate oratory skills with the aid of Power Point Presentations and also submit the report of the Technical seminar	1	3		2					**2**	3		1	2		1
CO5	Exhibit interview facing skills and team leading qualities															
CO	Overall	2	3		2					2	3		2	3		2

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.

3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in SecondYear First Semester. The evaluation is purely internal and will be conducted as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9^{th} week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

II - II

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8CC05**	Analog Circuits (Common to ECE, EEE AND ECM)	2	0	0	2

Course Objectives :
To understand the basic functioning and applications of the basic building blocks of analog electronic circuits - amplifiers and oscillators.

COURSE OUTCOMES :
After studying this course, the students will be able to

1. Distinguish between small and large signal amplifier and able to compare the conversion efficiency levels
2. Analyze and Design tuned RF amplifiers and different types of sweep generators
3. Understand linear and non-linear wave shaping methods and able to Analyze various types of Logic gates and Sampling gates.
4. Understand and design various types of multivibrators and applications

CO	ANALOG CIRCUITS (8CC05)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	*Distinguish between small and large signal amplifiers.*	3	3	2	2	3				2			2	3	3	2
CO2	*Analyze and Design tuned and RF amplifiers*	3	3	3	2	3				2			2	3	3	2
CO3	*Understand linear and non-linear wave shapingmethods*	3	3	3	3	3				2			2	3	3	2
CO4	*Understand analyze and design various types of multivibrators, their analysis, designing and applications*	3	3	3	3	3				2			2	3	3	2

CO5	*Explain different sweep generators and their applications*	3	3	3	3	3				2			2	3	3	2
C06	*Analyze various types of Logic gates and Sampling gates*	3	3	2	2	3				2			2	3	3	2
Overall		3	3	3	3	3				2			2	3	3	2

UNIT I[Lecture hrs – 9]

POWER AMPLIFIERS [T1] [CO1]

Classification of Power Amplifiers - Class A, B, AB & C power amplifiers –push pull configuration, complementary symmetry circuits, Distortion in Amplifiers. Harmonic distortion and Crossover Distortion in Power Amplifiers– Conversion efficiency and relative performance.

UNIT II[Lecture hrs – 9]

TUNED AMPLIFIERS [T1] [CO2]

Introduction to Tuned Amplifiers, Q-Factor. single tuned capacitive coupled amplifier, tapped single tuned capacitance coupled amplifier, single tuned inductively coupled amplifier, stagger tuning, synchronous tuned Amplifier.

UNIT III[Lecture hrs – 9]

WAVE SHAPING – Linear and Non-linear: **[T2,T3] [CO3]**

RC high pass, low pass circuit response for sinusoidal, step, pulse, square, ramp & exponential inputs- Differentiator –Integrator. RL, Diode clippers- Transistor clipper- clipping at two independent levels – Emitter coupled clipper- comparator-– Applications of voltage comparators.

Clamping operation – clamping with source, diode resistances- clamping circuits theorem- practical clamping circuits.

UNIT IV[Lecture hrs – 9]

MULTIVIBRATORS: [T2] [CO4]

Stable states of BistableMultivibrator A fixed bias transistor BistableMultivibrator -A self biased transistor BistableMultivibrator - commutating capacitor – Unsymmetric triggering of BistableMultivibrator - triggering through a unilateral device- symmetrical triggering – Schmitt trigger circuit.

General operation of monostablemultivibrator, collector coupled monostablemultivibrator - wave forms of collector coupled monostablemultivibrator - Emitter coupled monostablemultivibrator - triggering of monostablemultivibrator. Astablemultivibrator, collector coupled Astablemultivibrator -Emitter coupled Astablemultivibrator. Designing ofBistable, Monostable and AstableMultivibrators.

UNIT V[Lecture hrs – 9]

TIME BASE GENERATORS: [T2] [CO2]

General features of time base signals-sweep circuit using a transistor switch-UJT,UJT characteristics, UJT as a sweep circuit, - General considerations & principles of Miller & Boot strap time base generators- the transistor miller time base- the transistor, Boot strap time base generator- A simple current sweep transistor current time base generator.

UNIT VI[Lecture hrs – 9]

SAMPLING and LOGIC GATES: [T2] [CO3]

Basic operating principle unidirectional, Bidirectional sampling gates using diodes, transistors-reduction of pedestal effect and sampling oscilloscope.

LOGIC GATES: Digital operation of a system- OR, AND, NOT, NAND &NOR gates- DTL Logic– RTL Logic, TTL logic – comparison.

Text Books:

[T1] Integrated electronics-J.Milliman and C.C.Halkias, MC Graw –Hill-1972

[T2] Pulse digital and switching wave forms-J. Millman and H. Taub, Tata McGraw-Hill, New Delhi,2001.

[T3] Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002 .

References:

[R1] Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.

[R2] Wave Generation and Shaping - L. Strauss

[R3] Electronic Circuit Analysis-K.Lal Kishore, 2004, BSP

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8CC06**	Analog & Digital Communications	2	1	0	3

Prerequisite: Probability theory and Stochastic Processes

Course Objectives:

- To develop ability to analyze system requirements of analog and digital communication systems.
- To understand the generation, detection of various analog and digital modulation techniques.
- To acquire theoretical knowledge of each block in AM, FM transmitters and receivers.
- To understand the concepts of baseband transmissions,source coding and channel coding**..**

Course Outcomes: Upon completing this course, the student will be able to

- Analyze and design of various continuous wave and angle modulation and demodulation techniques
- Understand the effect of noise present in continuous wave and angle modulation techniques.
- Attain the knowledge about AM , FM Transmitters and Receivers
- Analyze and design the various Pulse Modulation Techniques.
- Understand the concepts of Digital Modulation Techniques and Baseband transmission, source coding and channel coding **.**

CO	Analog & Digital Communications (**8CC06**)	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	Analyze and design of various continuous wave and angle modulation and demodulation techniques	2	2	2	2	2						2		2	2	
CO2	Understand the	2	2	2	2	2								2	2	

	effect of noise present in continuous wave and angle modulation techniques.															
CO3	Attain the knowledge about AM , FM Transmitters and Receivers	2	2	2	2	2								2	2	
CO4	Analyze and design the various Pulse Modulation Techniques	2	2	2	2	2								2	2	
CO5	Understand the concepts of Digital Modulation Techniques and Baseband transmission, source coding and channel coding	2	2	2	2	2								2	2	
Overall		2	2	2	2	2								2	2	

UNIT – I[Lecture hrs – 9]

Amplitude Modulation

Need for modulation, Amplitude Modulation - Time and frequency domaindescription, single tone modulation, power relations in AM waves, Generation of AM waves - Switching modulator, Detection of AM Waves - Envelope detector, DSBSC modulation - time and frequency domain description, Generation of DSBSC Waves - Balanced Modulators, Coherent detection of DSB-SC Modulated waves, COSTAS Loop, SSB modulation - time and frequency domain description, frequency discrimination and Phase discrimination methods for generating SSB, Demodulation of SSB Waves, principle of Vestigial side band modulation.

Applications: AM transmitter system

UNIT –II[Lecture hrs – 9]

Angle Modulation

Basic concepts of Phase Modulation, Frequency Modulation: Single tonefrequency modulation, Spectrum Analysis of Sinusoidal FM Wave using Bessel functions, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Signal-

Armstrong Method, Detection of FM Signal: Balanced slope detector, Phase locked loop, Comparison of FM and AM., Concept of Pre-emphasis and de-emphasis.

Applications: Design of a 88-108 MHz FM system using FDM

UNIT - III

Transmitters

Classification of Transmitters, AM Transmitters, FM Transmitters

Receivers

Radio Receiver - Receiver Types - Tuned radio frequency receiver, Superhetrodynereceiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, Image frequency, AGC, Amplitude limiting, FM Receiver, Comparison of AM and FM Receivers.

Applications: Design of an AM transmitter system.

UNIT - IV

Pulse Modulation

Types of Pulse modulation- PAM, PWM and PPM.Comparison of FDM and TDM.

Pulse Code Modulation

PCM Generation and Reconstruction, Quantization Noise, Non-UniformQuantization and Companding, DPCM, Adaptive DPCM, DM and Adaptive DM, Noise in PCM and DM.

Applications: Design of E1 and T1 digital-carrier systems

UNIT - V

Digital Modulation Techniques

ASK- Modulator, Coherent ASK Detector, FSK- Modulator, Non-Coherent FSK Detector, BPSK-Modulator, Coherent BPSK Detection. Principles of QPSK, Differential PSK and QAM.

Baseband Transmission and Optimal Reception of Digital Signal

A Baseband Signal Receiver,Probability of Error, Optimum Receiver, Coherent Reception, ISI, Eye Diagrams.

Applications: Design of MODEM for voice transmission

Unit-VI:

SOURCE CODING

Introduction, advantages, Shannon's theorem for Channel capacity, Huffman code, Shannon-Fano coding, bandwidth –S/N trade off.

CHANNEL CODING

Introduction - types of errors, redundancy, detection vs correction, forward error correction versus retransmission; linear block codes, error detection and correction capabilities of linear block codes, Hamming code, cyclic codes: encoding, syndrome calculation, decoding, CRC codes – hardware realization; convolutional codes: encoding using state, tree and trellis diagrams, decoding using Viterbi algorithm

APLLICATIONS : Design of channel coding for 3G

TEXTBOOKS:

1. Analog and Digital Communications – Simon Haykin, John Wiley, 2005.

2. Electronics Communication Systems-Fundamentals through Advanced-Wayne Tomasi, 5th Edition, 2009, PHI.

REFERENCE BOOKS:

1. Principles of Communication Systems - Herbert Taub, Donald L Schilling, GoutamSaha, 3rd Edition, McGraw-Hill, 2008.
2. Electronic Communications – Dennis Roddy and John Coolean , 4th Edition , PEA, 2004

3. Electronics & Communication System – George Kennedy and Bernard Davis, TMH 2004 Analog and Digital Communication – K. Sam Shanmugam, Willey,20

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8CC07**	IC Applications	**2**	**0**	**0**	**2**

Course Objectives

- To maintain the right blend of theory and practice in analyzing and designing a wide variety of applications using IC 741 op-amps
- To acquaint the learners with a wide variety of IC logic families, and their applications.

Course Outcomes

After studying this course, the students will be able to

[CO9] Demonstrate the concepts of Differential Amplifier and Operational Amplifier and their characteristics.

[CO10] Design the basic circuits using IC 741 op-amp.

[CO11] Explore, design and analyze active filters, timers, oscillators, voltage controlled oscillator DACs and ADCs, and IC regulators.

[CO12] Classify and characterize the TTL/ECL/CMOS Logic Families and design of various logic gates using them.

CO	**IC Applications (8CC07)**	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Demonstrate the concepts of Differential Amplifier and Operational Amplifier and their characteristics.	3		2											2	
CO2	Design the basic circuits using Operational Amplifiers.		2	3												
CO3	Explore, design and analyze Filters, Timers, Voltage Controlled Oscillator and Phase Locked Loop.		2	3										3		
CO4	Demonstrate the design and analyze Oscillators, D/A Converters and A/D Converters.		2	3										3		
CO5	Classify and characterize the various Logic Families.				2											

CO6	Explore the design of various logic gates using CMOS logic			3		3								3	3	
CO	Overall	3	2	3	2	3								3	3	

UNIT – I[Lecture hrs – 9]

OPAMP & ITS CHARACTERISTICS [T1] [CO1]

Differential Amplifiers and its Characteristics.Op-Amp Block Diagram, Ideal OP-AMP Characteristics, DC and AC Characteristics.741 Op-Amp and its Features and Characteristics. Parameters Measurement: Offset Voltage and Current, Slew Rate and CMRR. Frequency Compensation.

UNIT – II [Lecture hrs – 9]

BASIC APPLICATIONS OF OP-AMPs [T1] [CO2]

Adder/Subtractor, Difference Amplifier, Instrumentation Amplifier, Differentiator, Integrator, V/I & I/V Converters, Comparators, Multivibrators, Square and Triangular Waveform Generators, Clippers, Clampers, Peak Detector, S/H circuit.

UNIT – III[Lecture hrs – 9]

FILTERs, TIMERs & PLLs [T1] [CO3]

Filters:Introduction, Butterworth Filters- First and Second Order Active Filters- LPF, HPF, BPF, BRF. Introduction to 555 Timer, Functional Block, 555 timers as Monostable and AstableMultivibrators and Applications, Schmitt Trigger. Voltage Controlled Oscillator (IC 566), Phase Locked Loop.

Applications: Design of visitors counter using 555 timer.

UNIT – IV[Lecture hrs – 9]

OSCILLATORS, D/A AND A/D CONVERTERS, IC REGULATORS [T1] [CO3]

Oscillators: Introduction, Design and Analysis of Wein Bridge, RC Phase shift Oscillators using op-amp. D/A Converters: Introduction, Characteristic Parameters, R-2R Ladder, Weighted Resistor, Inverter R-2R type D/A Converter, A/D Converters: Introduction, Characteristic Parameters, Counter Type, Dual Slope, Successive Approximation and Flash types A/D Converters, IC REGULATORS: Three terminal voltage regulators 7805, 7809, 7912, IC 723.

UNIT – V[Lecture hrs – 9]

LOGIC FAMILIES [T2] [CO4]

Classification of IC Logic Families, Multi emitter transistor logic. Standard TTL NAND & NOR Gate-Analysis & TTL Open Collector Outputs ,Tristate TTL. Unsaturated logic- ECL logic family ,ECL Inverter/Buffer, ECL NOR/OR logic. Electrical characteristics of logic gates.

UNIT – VI[Lecture hrs – 9]

MOS& CMOS LOGIC FAMILY [T2] [CO4]

NMOS & PMOS logic- Logic gates implementation, Passive pull up & active pull up .CMOS logic family- Design of logic gates and Boolean functions. CMOS Open Drain and Tristate Outputs. Comparison of Various Logic Families.IC interfacing, TTL driving CMOS & CMOS driving TTL.

Applications: Design of 4x1 MUX using CMOS

Text Books

[T1] D. Roy Chowdhary, Linear Integrated Circuits , New Age Publications (P) Ltd, 2nd Edition, 2003.

[T2] John F. Wakerly, Digital Design Principles & Practices, PHI/ Pearson Education Asia, 3rd Ed., 2005.

References

[R1] Ramakanth A. Gayakwad, Op-Amps & Linear ICs, PHI,1987.

[R2] Sergio Franco, Design with Operational Amplifiers & Analog Integrated Circuits, McGraw Hill, 1988.

[R3] R.F. Coughlin & Fredrick Driscoll, Operational Amplifiers & Linear Integrated Circuits, PHI, 6th Edition.

[R4] K. Lal Kishore, Linear Integrated Circuit Application, Pearson Educations,2005.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8C408**	Electromagnetic Waves and Transmission Lines	**3**	**0**	**0**	**3**

Prerequisites: Coordinate Systems and Vector Calculus

Course Objectives

- To be confident about the fundamentals of electrostatics and magneto statics and their concepts in field calculations
- To acquire the knowledge about the wave concepts and properties of transmission lines which are required as prerequisites to antennas and wave propagation.

Course Outcomes

After studying this course, the students will be able to

[CO1]. Apply the concepts of electrostatics in the study electric field and in understanding the Maxwell's two equations which are useful in understanding propagation of EM waves.

[CO2]. Apply the concepts of static magnetic field in the study magnetic field and in understanding the Maxwell's two equations which are useful in understanding propagation of EM waves.

[CO3]. Understand the property of EM energy at different boundary conditions and Maxwell's equations which will be helpful in understanding the reflection properties of EM Energy when the EM energy propagates through different media.

[CO4]. Design different transmission lines and Understand the concepts of high frequency dissipation less and open& short circuited lines

CO	**ELECTROMAGNETIC WAVES AND TRANSMISSION LINES(8C408)**	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	*Apply the Maxwell's equations in propagation of EM waves*	3	3	2	1	2							2	3	3	2
CO2	*Demonstrate the behavior of EM waves in different media*	3	3	3	1	2							1	3	3	1
CO3	*Understand the property of EM energy*	3	3	3	1	2							1	3	3	1

	at different boundary conditions															
CO4	*Understand the impossibility of TEM waves in rectangular wave guides*	3	3	3	1	2							1	3	3	1
CO5	*Design different transmission lines*	3	3	3	1	2							3	3	3	3
C06	*Understand the concepts of high frequency dissipation less and open& short circuited lines*	3	3	2	1	2							2	3	3	2
Overall		3	3	3	1	2							2	3	3	2

UNIT I

REVIEW OF VECTOR ANALYSIS AND ORTHOGONAL COORDINATE SYSTEMS
Line, surface, and volume integrals. Curl, divergence and gradient of fields.

ELECTROSTATICS [T1],[T2],[CO1]

Static electric fields, Coulomb's Law, Gauss Law and Applications, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation time, Parallel plate, Coaxial and Spherical capacitors.
Applications: Electric current in vacuum and gases, photocopier.

UNIT II

MAGNETOSTATICS:[T1],[T2],[CO2]
Static magnetic fields, Ampere's Circuital Law, Magnetic Flux Density, Magnetic Scalar and Vector Potentials. Forces due to Magnetic fields, Ampere's Force Law, Inductance and magnetic energy.
Applications: Electromagnetic suspension (EMS) maglev train, speakers and micro phones.

UNIT III

MAXWELL'S EQUATIONS:[T1],[T2],[CO3]
Differential and Integral forms-word statement-proofs and conversion. Faraday's Law and their Application in free space, polarization,Poynting vector, Power flow and energy storage; Skin depth,Boundary conditions and boundary value problems.
.**Applications: Electromagnetic wave propagation**

UNIT I V

REFLECTION AND REFRACTION OF EM WAVES:[T1][T2][R2][CO3]
Reflection by a perfect conductor-Normal and Oblique Incidence-Reflection by a perfect Insulator-Normal and Oblique Incidence. Brewster angle.EM Wave characteristics, wave equations,Guided

waves between parallel Planes, Power losses in plane conductor. Pointing Theorem.Phase and group velocity.

Applications: Calculation of power loss in plane conductor.

UNIT V

TRANSMISSION LINE THEORY:[T2][R1][CO4]

Transmission line – general solution –The infinite line – Wavelength, velocity of propagation – Waveform distortion – the distortion less line - Loading and different methods of loading – Line not terminated in Z_0 – Reflection coefficient – calculation of current , voltage, power delivered and efficiency of transmission – Input and transfer impedance – Open and short circuited lines – reflection factor and reflection loss.

Applications: Calculation of voltage and current distribution in a 10-Km transmission line.

UNIT VI

HIGH FREQUENCY TRANSMISSION LINES:[T2][R1][CO4]

Transmission line equations at radio frequencies – Line of Zero dissipation – Voltage and current on the dissipation less line, Standing Waves, Nodes, Standing Wave Ratio – Input impedance of the dissipation less line - Open and short-circuited lines – Power and impedance measurement on lines – Reflection losses. S-Parameters, Smith Chart-Construction and applications.

Applications: determination of load standing wave ratio and reflection coefficient with smith chart

Text Books:

1.W.H.Hayt Jr., Engineering Electromagnetics, Tata Mc-Graw-Hill, 2001.
2. Elements of Electromagnetics-Mathew N.OSadiku, 4ed., 2008, Oxford Univ.Press

References:

1. Transmission Lines and Networks by Umesh Sinha
2.EC Jordan, EM waves and radiating systems, PHI, 1995.
3. N. Narayana Rao, Elements of Engineering Electro magnetics, Pearson Education, 2006.
4. J.D.Ryder, Networks lines and fields, PHI, 1990

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8ZC01**	Economics, Accountancy and Management Science	2	0	0	2

Course Objectives:

- To understand the basics of Managerial Economics at Micro level, Demand analysis and production analysis in particular.
- To understand cost concept, Revenues and Market structure
- To understand and identify various basic concepts of Accounting, Double entry system and Book keeping.
- To understand the concepts of Capital expenditure, Revenue expenditure and Final accounts.
- To make student understand the basics of Management, its principles and various functions performed in organization.
- To make student learn about various personality traits, perception, attitudes of individuals working in organization.

UNIT-1

INTRODUCTION TO MANAGERIAL ECONOMICS:
Definition, Nature and scope of Managerial Economics, consumer's Equilibrium.Theory of Demand, Demand function, Determinants, exceptions - Price Elasticity of Demand and Demand forecasting.Theory of supply, Production function and Economies of scale.

UNIT- 2

INTRODUCTION TO COST, REVENUE AND MARKET STRUCTURE:
Cost Analysis, types of costs, Revenue Analysis, Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems). Market structures: Types of competition, Features of Perfect competition, Monopoly, Monopolistic Competition and oligopolistic competition.

UNIT-3

INTRODUCTIONT O FINANCIAL ACCOUNTING:
Meaning and Definition of Accounting, principles of Accounting, Double-Entry system of Accounting, Book Keeping, introduction to Journal, Ledger and its types, Introduction to Trial balance, problems and solutions of trial balance.

UNIT-4

INTRODUCTION TO FINAL ACCOUNTS:
Introduction to Final Accounts, Concepts of classifications of Revenue and Capital expenditures, Final accounts: Trading account, Profit and Loss Account, Balance sheet, Problems and solutions of Final accounts with adjustments.

UNIT-5

INTRODUCTION TO MANAGEMENT:
Management- Definitions, Fayol's principles of Management, Levels of Management, functions of management. Planning: types of planning, planning process; Organizing: Organizational Design and structure, staffing; Directing;, Controlling: Basic control process.

UNIT-6

INTRODUCTION TO ORGANIZATIONAL BEHAVIOR: Definition, Nature and Scope, Perception – Perceptual selectivity and organization, Personality and Attitudes, Determinants of personality Formation of Attitudes-**,** Perceptual Distortions Attribution analysis Attribution theories, Johari Window and Transactional Analysis.

Essential Readings:

1. A R Aryasri: Managerial Economics, Tata Mc Graw Hill
2. A R Aryasri: Management Science, Tata Mc Graw Hill

Suggested Readings:

1. S A Siddiqui & A S Siddiqui, Managerial Economics & Financial Analysis, New Age
2. Accountancy – I Tulasian Tata Mcgraw Hill Co
3. Koontz &Weihrich: Essentials of Management, 6/e, TMH, 2005

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8FC27**	Python Programming concepts	2	0	0	2

Course Objectives:-

After taking this course, you should be able to:

- Use Python interactively, execute a Python script at the shell prompt, use Python types, expressions, and None, use string literals and string type, use Python statements (if...elif..else, for, pass, continue, . . .), understand the difference between expressions and statements, understand assignment semantics, write and call a simple function., utilize high-level data types such as lists and dictionaries, understand the difference between mutable and immutable types, write a simple class and access methods and attributes, import and utilize a module, read from and write to a text file.

- Learn the basic concepts and the ability to understand and **design algorithms** using greedy strategy, divide and conquer approach and dynamic programming.

Course Outcomes:

CO1: Gains exposure towards Python versions and their specifications and build programs using primitive data types.
CO2: Write applications that include functions, modules, packages along with respective exceptional handling mechanism.
CO3: Writes applications using features of Python and applications using Files.
CO4: Hands on exposure on NumPy/Tkinter/Plotpy modules
CO5: Analyze worst-case running times of algorithms using asymptotic analysis. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide and-conquer algorithms.
CO6: Describe the dynamic-programming paradigm and the greedy paradigm and explain when an algorithmic design situation calls for it. Synthesize dynamic programming and greedy algorithms and analyze them.

CO	Python Programming concepts (**8FC27**)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Gains exposure towards Python versions and their specifications and build programs using primitive data types	2	2		2	2				2		2		2	2	
CO2	Write applications that include functions, modules, packages along with respective	2	2		2	2				2		2		2	2	

	exceptional handling mechanism.															
CO3	Writes applications using features of Python and applications using Files	2	2		2	2				2		2		2	2	
CO4	Hands on exposure on NumPy/Tkinter/Plotpy modules	2	2		2	2				2		2		2	2	
CO5	Analyze worst-case running times of algorithms using asymptotic analysis. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide and-conquer algorithms	2	2	2	2	2				2		2		2	2	
C06	Describe the dynamic-programming paradigm and the greedy paradigm and explain when an algorithmic design situation calls for it. Synthesize dynamic programming and greedy algorithms and analyze them	2	2		2	2				2		2		2	2	
Overall		2	2	1	2	2				2		2		2	2	

UNIT I: **Introduction to Python**:

History, Features, Modes of Execution, Setting up path, working with Python Basic Syntax, Variable and Data Types, Operators. Conditional Statements (If, If- else, Nested if-else)

Looping (for, While Nested loops) Control Statements (Break, Continue, Pass).

- **Functions:** Defining a function, calling a function, Types of functions, Function Arguments

UNIT II:String Manipulation:

Accessing Strings, Basic Operations, String slices

- **Lists:** Accessing list, Operations, Tuple: Accessing tuples, Operations,
- **Dictionaries:** Accessing values in dictionaries,
- **Modules:** Importing module, Math module, Random module, Packages

- **Exception Handling**:Exception, Exception Handling, Except clause, Try? Finally clause User Defined Exceptions
-

UNIT III:

- **Python- OOPs concept:** Class and object, Attributes, Inheritance, Overloading Overriding, Data hiding.
- **Regular expressions:** Match function, Search function, Matching VS Searching, Modifiers Patterns.

UNIT IV:

Case Study with NumPy/PlotPy/SciPy/GUI Programming, Introduction, Tkinter programming, Tkinter widgets

UNIT V:

Introduction: Algorithm, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notations

- **Divide and conquer:** General method, applications-Binary search, Merge sort
- **Applications:** Implementing Algorithms ,performance analysis and sorting techniques using Python

UNIT VI:

- **Greedy method**: General method, applications- 0/1 knapsack problem, Minimum cost spanning trees.
- **Dynamic Programming**: General method, applications- Travelling sales person problem, Reliability design.
- **Applications:** Implementing some Greedy method and Dynamic programming techniques using Python

Text books:

1. Think Python: How to Think Like a Computer Scientist Allen B. Downey, O'Relly publications.
2. Learning with Python by Jeffrey Elkner, Chris Meyers Allen Downey, Dreamtech Press.
3. Fundamentals of Computer Algorithms, Ellis Horowitz,Satraj Sahni and Rajasekharam,Galgotia publications pvt. Ltd.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8HC05**	Environmental Science and Ecology	2	0	0	2

Course Objectives:
1. To understand structure and function of ecosystem
2. To learn classification and uses of natural resources
3. To learn about Understanding the impacts of developmental activities and mitigation measures.
4. To know the source, causes and preventive methods of pollution
5. To understand the importance of ecological balance for sustainable development.
6. To understand the environmental policies and regulations

Course Outcomes
After completion of the course, the student will be able to:
1. Understand about ecosystem and energy flow among the organisms.
2. Know the resources available, use of them and overexploitation of the resources in the nature.
3. Learn the value, use and value of biodiversity.
4. Understand the causes and effect of pollution and implement measures in control of pollution.
5. Understand the sustainable development and implement green technology for sustainable development.
6. Learn and implement policy to protect the environment.

CO	Environmental Science and Ecology (**8HC05**)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand about ecosystem and energy flow among the organisms				2		2	2					2			1
CO2	Know the resources available, use of them and overexploitation of the resources in the nature.				2		2	2	2				2			1
CO3	Learn the value, use and value of biodiversity				2		2	2	2				2			1

CO4	Understand the causes and effect of pollution and implement measures in control of pollution.				2		2	2	2				2			1
CO5	Understand the sustainable development and implement green technology for sustainable development				2		2	2					2			1
C06	Learn and implement policy to protect the environment				2		2	2	2				2			1
Overall					2		2	2	2				2			1

UNIT-I Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity.

UNIT-II Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source.

UNIT-III Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT-IV Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants. Acid rain-Threshold limit values of chemicals present in environment, Global warming, Ozone layer depletion, Water pollution: Sources and types of pollution. Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Sewage water Treatment, Kyoto protocol, and Montréal Protocol.

UNIT-V Sustainable development and Green Technology: Concept of sustainable development, threats to sustainability population and its explosion, Crazy consumerism, over- exploitation of resources, strategies for achieving sustainable development environmental education, conservation

of resources, urban sprawl sustainable cities and sustainable communities, human health , role of IT in Environment, Environmental Ethics, Environmental Economic – Concept of Green Building, Clean Development Mechanism (CDM).

UNIT-VI Environmental Policy, Legislation & Environment Impact Assessment: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects.Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

TEXT BOOKS:

1. Perspectives in Environmental Studies: Kaushik A. and Kaushik, C.P. New Age International (P) Ltd. (2008)

REFERENCE BOOKS:

1. Environmental Studies by Erach Bharucha, 2005 University Press.
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
4. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
5. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
6. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8CC74**	Analog Circuits Lab (Common to ECE, EEE AND ECM)	**0**	**0**	**2**	**1**

Course Objectives
To prepare students to practice the design and analysis of any Analog electronics circuit.

Course Outcomes:
At the end of the laboratory course, the students will be able to

1. To understand the design and working of various linear and non-linear wave shaping circuits.
2. To demonstrate the working principle of various multivibrators and functionalities of various logic gates.
3. To perform and verify the working of oscillators, feedback amplifiers and voltage regulators.
4. To perform laboratory experiment to verify the conversion efficiency of various power amplifiers.

CO	Analog Circuits Lab (**8CC74**)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	To understand the design and working of various linear and non-linear wave shaping circuits.	**3**	**3**	**3**	**2**	**2**				**2**				**2**	**2**	
CO2	To demonstrate the working principle of various multivibrators and functionalities of various logic gates	**3**	**3**	**3**	**2**	**2**				**2**				**2**	**2**	
C	To	**3**	**3**	**3**	**2**	**2**				**2**				**2**	**2**	

O3	perform and verify the working of oscillators, feedback amplifiers and voltage regulators.															
CO4	To perform laboratory experiment to verify the conversion efficiency of various power amplifiers.	**3**	**3**	**3**	**2**	**2**				**2**				**2**	**2**	
	overall	**3**	**3**	**3**	**2**	**2**				**2**				**2**	**2**	

Syllabus Content:

Part-A

Hardware based experiments

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers. clampers.
3. UJT Relaxation Oscillator
4. Astable and monostableMultivibrator.
5. BistableMultivibrator.
6. Study of Logic Gates with discrete components.

Part-B

Software Simulation based experiments (Multisim OR Pspice OR Tina Pro Or Equivalent Simulation Software)

1. Common Emitter and Common Source amplifier
2. Voltage shunt and Feedback Amplifier
3. Cascade Amplifier (CE+CE, CE+CC)
4. RC Phase Shift Oscillator using Transistors
5. Class- A and Class-B Complementary Symmetry Power Amplifier
6. Series and Shunt Voltage Regulator.

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8CC75**	Analog & Digital Communication Lab	**0**	**0**	**2**	**1**

Prerequisites: SS, PTSP, BS Lab

Course Objectives:
The objectives of this course are

- To perform laboratory experiments on various analog and digital modulation techniques and measure the performance parameters.

Course Outcomes: After studying this course, the students will be able to

CO1	Demonstrate the modulation and demodulation of few analog and digital modulation techniques.
CO2	Verifying the spectral components of AM and FM&the concepts of frequencyand time division multiplexing techniques
CO3	Demonstrate the modulation and demodulation of few pulse analog, and pulse digital modulation techniques &Verifying sampling theorem
CO4	Demonstrate the modulation and demodulation of digital modulation technique&Generation of line coding techniques.

CO	Analog & Digital Communication Lab (**8CC75**)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Demonstrate the modulation and demodulation of few analog and digital modulation techniques.	**2**	**2**			**2**								**2**	**2**	
CO2	Verifying the spectral components of AM and FM&the concepts of frequencyand time division multiplexing techniques	**2**	**2**			**2**								**2**	**2**	
CO3	Demonstrate the modulation and demodulation	**2**	**2**			**2**								**2**	**2**	

	of few pulse analog, and pulse digital modulation techniques &Verifying sampling theorem															
CO4	Demonstrate the modulation and demodulation of digital modulation technique&Generation of line coding techniques.	**2**	**2**			**2**								**2**	**2**	
	overall	**2**	**2**			**2**								**2**	**2**	

Part A:

1. AM - Generation and Detection
2. DSBSC - Generation and Detection
3. FM - Generation and Detection
4. Spectrum Analysis of AM and FM signals
5. FDM – Verification
6. Receiver Characteristics

Part B:

1. Sampling Theorem – Verification
2. PPM - Generation and Detection
3. TDM – Verification
4. PCM - Generation and Detection
1. DM - Generation and Detection
2. Line Coding Techniques
3. ASK, FSK,PSK - Generation and Detection

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8CC76**	IC Applications Lab (Common to ECE, EEE and ECM)	0	0	2	1

Prerequisites: EDC, DLD, DLD Lab, ECNA.

Course Objectives:

The objectives of this course are

- To Design and analyze the various circuits and systems using IC 741 Op-Amp.
- To Design and analyze the various circuits and systems using Analog ICs.

Course Outcomes: After studying this course, the students will be able to

- To explore the operating modesof IC 741 OP-AMP.
- To design applications using 741Op-Amp
- To understand and implement applications using 555 Timers
- To design D to A converters and IC voltage regulators

CO	IC Applications Lab (**8CC76**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	To explore the operating modesof IC 741 OP-AMP		3	3	3					2				3		
CO 2	To design applications using 741Op-Amp		2	2						2				2		
CO 3	To understand and implement applications using 555 Timers		2	2						2				3		
CO 4	To design D to A converters and IC voltage regulators		3	3	3					2				3		
CO	Overall		3	3	3					2				3		

Syllabus Content

(IC Application Lab)

Design and testing of

1. OP AMP Modes(-vefeed back) – Inverting ,Non inverting, Differential amp, Unity gain.
2. OP AMP Applications – Adders, Subtractor.
3. OP AMP Applications – Comparator Circuits.
4. OP AMP Applications – Clipper Circuits.
5. Square wave generator using OP AMP
6. Triangular wave generator using OP AMP
7. Active Filter Applications – LPF, HPF (first order)
8. Oscillators-RC phase shift ,Wein bridge.
9. IC 555 Timer – Monostable
10. IC 555 Timer -Astable
11. 4 bit DAC using OP AMP.
12. IC 723 voltage regulator

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8C466**	Comprehensive Test and Viva –Voce – IV	1	0	0	1

Comprehensive Test and Viva Voce	**The subjects studied in the Semester concerned related to branches concerned and for placements**
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

CO	Comprehensive Test and Viva –Voce – IV (**8C466**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Assess the relevant courses they have undergone till the completion of that academic year. Comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their employability skills. They are asked to comprehend the concepts in the core subjects and the elective subjects, to make them ready to face technical interviews which improve their	3	2								2			3		

	employability skills. Assessment is done in the relevant courses they have undergone till the completion of that academic year.															
CO	Overall	3	2								2			3		

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks :

*Comprehensive Test : 70 marks

**Viva Voce : 30 marks

Total : 100 marks

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 20 marks.

End Semester Examination for Comprehensive Test will be taken for 50 marks.

Total marks for Comprehensive Test will be 70.

**Average of best two of Mid Tests of Mid – I, Mid – II and Mid - III for Viva Voce will be taken for 10 marks.

End Semester Examination for Comprehensive Viva Voce shall be evaluated for 20 marks.

The total for Viva Voce will be 30.

Thus the total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.

The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II	**8C467**	Technical Seminar - IV	1	0	0	1

Course Objective :

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

Course Outcomes: After completing this course, the student will be able to

1. Identify current general, political and technology related topics.
2. Arrange and present seminar in a effective manner
3. Collect, survey and organize content in presentable manner
4. Demonstrate oratory skills with the aid of Power Point Presentations
5. Exhibit interview facing skills and team leading qualities

CO	Technical Seminar – IV(**8C467**)	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Identify current general, political and technology related topics.	3	3		2					2	1		3	3		3
CO 2	Arrange and present seminar in a effective manner	3	3	`	2					2	2		3	3		2
CO 3	Collect, survey and organize content in presentable manner	2	2		2					2	3		1	3		1
C04	Demonstrate oratory skills with the aid of Power Point Presentations and also submit the report of the Technical seminar	3	2		1					2	3		1	2		1

CO 5	Exhibit interview facing skills and team leading qualities	2	3							2	3		1	2		1
CO	Overall	3	3		2					2	3		2	2		2

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in SecondYear SecondSemester. The evaluation is purely internal and will be conducted as follows:

Sl.No	**Description**	**Marks**
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9^{th} week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

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Syllabus for B. Tech (E.C.E.) – A20 regulation						
Year/Sem	**Sub. Code**	**Subject Name**	L	T	P/D	C
II – II		Summer Break - Internship–I				

Course Objective :

Develop ability to be a public speaker. Learn the importance of delivering seminars for demonstrating oratory and develop interview facing skills.

Course Outcomes: After completing this course, the student will be able to

1. Select the real-time problem in the industry.
2. Analyze the requirements with respect to the problem statement
3. Design the optimal solution for the problem.
4. Implement the solution using the apropriate modern tools
5. Present and submit the report

CO	Summer Break - Internship–I	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO 1	Select the real-time problem in the industry.	2	2	2	2	3				3				2	2	
CO 2	Analyze the requirements with respect to the problem statement		3	2	2	3				3				2	2	
CO 3	Design the optimal solution for the problem.			3	2	3				3				1	2	
CO 4	Implement the solution using the apropriate modern tools	2	2	2	3	3				3				2	3	
CO 5	Present and submit the report	3	3	3	3	3				3				3	3	
CO	Overall					3				3				2	2	

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.

4. If any student fails to present his/her seminar on the given slot, to genuine reasons, they may be asked to present in the subsequent slot/week.
5. Progress of the seminars need to be reviewed by the concerned HOD once in 15 days.
6. The evaluation for technical seminars has to be informed to students and displayed in the classrooms.
7. Report and presentation must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in Second Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9^{th} week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.