SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
R.V.S. NAGAR, CHITTOOR-517127, ANDHRA PRADESH.
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
REVISED SCHEME OF INSTRUCTION AND EXAMINATION UNDER R14 REGULATIONS

I B.Tech-I Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total Marks
1	14AHS02	Engineering Mathematics-I	3	1	-	3	30	70	100
2	14AHS04	Engineering Physics	3	1	-	3	30	70	100
3	14AHS05	Environmental Science	3	1	-	3	30	70	100
4	14AEE02	Network Theory	3	1	-	3	30	70	100
5	14ACS02	Programming in C & Data Structures	3	2	-	4	30	70	100
6	14AHS09	Engineering Physics Lab	-	-	3	2	30	70	100
7	14AME03	Engineering Workshop	-	-	3	2	30	70	100
8	14ACS04	C & Data Structures Lab	-	-	3	2	30	70	100
Total			**15**	**6**	**9**	**22**	**240**	**560**	**800**

I B.Tech-II Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P/D		Internal	External	Total Marks
1	14AHS01	Technical English - I	3	-	-	3	30	70	100
2	14AHS06	Engineering Mathematics-II	3	1	-	3	30	70	100
3	14AHS03	Engineering Chemistry	3	1	-	3	30	70	100
4	14AME01	Engineering Drawing	2	-	4	4	30	70	100
5	14AEC01	Electronic Devices and Circuits	3	1	-	3	30	70	100
6	14AHS07	Technical English Lab - I	-	-	3	2	30	70	100
7	14AHS08	Engineering Chemistry Lab	-	-	3	2	30	70	100
8	14AEC02	Electronic Devices and Circuits Lab	-	-	3	2	30	70	100
Total			**14**	**3**	**13**	**22**	**240**	**560**	**800**

II B.Tech-I Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total Marks
1	14AHS11	Engineering Mathematics-III	3	1	-	3	30	70	100
2	14AEC03	Electronic Circuit Analysis	3	1	-	3	30	70	100
3	14AHS12	Managerial Economics and Financial Analysis	3	1	-	3	30	70	100
4	14AEC04	Probability Theory and Stochastic Processes	3	1	-	3	30	70	100
5	14AEC05	Switching Theory and Logic Design	3	1	-	3	30	70	100
6	14AEC06	Signals and Systems	3	1	-	3	30	70	100
7	14AEC08	Electronic Circuits Simulation lab	-	-	3	2	30	70	100
8	14AEC09	Signals and Systems Lab	-	-	3	2	30	70	100
Total			**18**	**6**	**6**	**22**	**240**	**560**	**800**

II B.Tech-II Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total Marks
1	14AEE15	Electrical Technology	3	1	-	3	30	70	100
2	14AEC10	Analog Communications	3	1	-	3	30	70	100
3	14AEC11	Pulse and Digital Circuits	3	1	-	3	30	70	100
4	14AEC12	Linear IC Applications	3	1	-	3	30	70	100
5	14AEC13	Digital IC Applications	3	1	-	3	30	70	100
6	14AEC14	Electromagnetics and Transmission Lines	3	1	-	3	30	70	100
7	14AEC16	Pulse and Digital Circuits Lab	-	-	3	2	30	70	100
8	14AEE17	Electrical Technology Lab	-	-	3	2	30	70	100
Total			**18**	**6**	**6**	**22**	**240**	**560**	**800**
	14AHS15	Quantitative Aptitude and Reasoning-I(Audit Course)	3	-	-	-	-	-	-

III B.Tech-I Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total Marks
1	14AEC17	Digital Communications	3	1	-	3	30	70	100
2	14AEC18	VLSI Design	3	1	-	3	30	70	100
3	14AEC19	Antenna and Wave Propagation	3	1	-	3	30	70	100
4	14AEC20	Microprocessors and Microcontrollers	3	1	-	3	30	70	100
5	14AEC21	Electronic Measurements and Instrumentation	3	1	-	3	30	70	100
6	14AEE20	Control Systems	3	1	-	3	30	70	100
7	14AEC23	IC Applications & ECAD Lab	-	-	4	2	30	70	100
8	14AEC24	Analog & Digital Communications Lab	-	-	4	2	30	70	100
9	14AEC26	Comprehensive Online Examination	-	-	-	1	-	100	100
Total			**18**	**6**	**8**	**23**	**240**	**660**	**900**
	14AHS16	Quantitative Aptitude and Reasoning-II(Audit Course)	3	-	-	-	-	-	-

III B.Tech-II Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total Marks
1	14AEC27	Microwave Engineering	3	1	-	3	30	70	100
2	14AHS13	Technical English – II	3	1	-	3	30	70	100
3	14ACS07	Computer Organization	3	1	-	3	30	70	100
4	14AEC28	Digital Signal Processing	3	1	-	3	30	70	100
5	14AEC29	Optical Communications	3	1	-	3	30	70	100
6	**Choice based Credit Courses (Inter Department)**		3	1	-	3	30	70	100
	14AME58	Total Quality Management							
	14ACS35	Cloud Computing							
	14AEE37	Soft Computing Techniques							
7	14AHS14	Technical English Lab - II	-	-	4	2	30	70	100
8	14AEC32	Microprocessors & Microcontrollers Lab	-	-	4	2	30	70	100
9	14AEC33	Comprehensive Online Examination	-	-	-	1	-	100	100
Total			**18**	**6**	**8**	**23**	**240**	**660**	**900**
	14AMB01	Management Science (Audit Course)	3	-	-	-	-	-	-

IV B.Tech- I Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total Marks
1	14AEC34	Embedded Systems	3	1	-	3	30	70	100
2	14AEC35	Digital Design through VERILOG	3	1	-	3	30	70	100
3	14ACS19	Computer Networks	3	1	-	3	30	70	100
4	14AEC36	Digital Image Processing	3	1	-	3	30	70	100
Choice based Credit Courses (Department Specific)									
5	14AEC37	Wireless Communications & Networks	3	1	-	3	30	70	100
	14AEC38	Satellite Communications							
	14AEC39	Cellular and Mobile Communications							
Choice based Credit Courses (Department Specific)									
6	14AEC40	RF System Design	3	1	-	3	30	70	100
	14AEC41	Bio-Medical Instrumentation							
	14AEC42	Advanced Microcontrollers and Applications							
7	14AEC43	Digital Signal Processing Lab	-	-	4	2	30	70	100
8	14AEC44	Microwave and Optical Communications Lab	-	-	4	2	30	70	100
Total			**18**	**6**	**8**	**22**	**240**	**560**	**800**
	14AMB02	Professional Ethics (Audit Course)	3	-	-	-	-	-	-

IV B.Tech-II Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total Marks
MOOC-I									
1	14AEC46	Subject-I	-	-	-	3	30	70	100
	14AEC47	Subject-II							
	14AEC48	Subject-III							
	14AEC49	Subject-IV							
MOOC-II									
2	14AEC50	Subject-I	-	-	-	3	30	70	100
	14AEC51	Subject-II							
	14AEC52	Subject-III							
	14AEC53	Subject-IV							
3	14AEC54	Comprehensive Viva-Voce	-	-	-	2	-	100	100
4	14AEC55	Project Work	-	-	-	12	60	140	200
Total			**-**	**-**	**-**	**20**	**120**	**380**	**500**

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		L	T	P	C
Code: 14AHS02	**I B.Tech**	**3**	**1**	**0**	**3**

ENGINEERING MATHEMATICS – I

(Common to all branches)

Objectives:

The objectives of this course are to

1. model a wide range of engineering and practical problems as ordinary differential equations.
2. apply fundamental mathematical principles as well as computational techniques to the problems of engineering and scientific practice.
3. formulate the engineering problems in vectorial form.

Outcomes:

After completion of the course the student will be able to

1. comprehend the areas of application of differential equations.
2. apply the principles of differential equations, functions of variables separable, integration, Laplace transforms and vector calculus to the engineering and scientific problems.
3. obtain their solutions using various computational methods.

UNIT-I

DIFFERENTIAL EQUATIONS: Linear and Bernoulli's Equations – Non - homogenous Linear Differential equation of second and higher order with constant co-efficients. Newton's law of cooling - L-R-C circuits.

UNIT-II

FUNCTIONS OF SEVERAL VARIABLES: Maxima and Minima for functions of two variables – Lagrange's method of multipliers of 3 variables only. Curve Tracing - Cartesian and polar curves. Radius of Curvature - Cartesian and polar curves.

UNIT-III

APPLICATIONS OF INTEGRATION: Length of an arc and area using line integral. Multiple Integrals - Double and Triple integrals-Change of variables-Change of Order of integration(Cartesian and polar forms). Surface area and Volume of solid of revolution.

UNIT-IV

LAPLACE TRANSFORMS: Laplace transforms of standard functions - First Shifting Theorem - Transforms of derivatives and integrals- Unit step Function – Second Shifting Theorem –Laplace transforms of Periodic functions – Inverse Laplace transforms - Convolution theorem.

UNIT-V

VECTOR CALCULUS: Gradient, Divergence, Curl and their properties (without identities).

Vector Integration - Line Integrals – Potential functions - Area, Surface and Volume integrals - Green's theorem- Stoke's theorem& Gauss Divergence theorems (without proof) – problems on Green's, Stoke's and Gauss's Theorem

Text Books:

1. B.V.Ramana, A Text book of Engineering Mathematics-I, Tata Mc Grawhill
2. T.K.V.Iyengar, B.Krishna Gandhi and others, A Text book of Engineering Mathematics –I, S.Chand and company.
3. Dr.B.S.Grewal, Higher Engineering Mathematics.
4. E.Rukmangadachari and Keshava Reddy, A Text book of Engineering Mathematics-I, Pearson Education

References:

1. C.Sankaraiah,A Text book of Engineering Mathematics, VGS book links
2. Thomson ,A Text book of Engineering Mathematics, Book Collection
3. N.Bail, M.Goyal & C.Walking, A Text book of Advanced Engineering Mathematics-A computer approach

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I B.Tech-I SEMSTER	**L**	**T**	**P**	**C**
	3	**1**	**0**	**3**

12AHS04 ENGINEERING PHYSICS
(Common to EEE, ECE, CSE & IT)

Objectives:

1. To introduce basic physics concepts relevant to different branches of Engineering and Technology
2. To prepare graduates in understanding the basic principles of Modern Optics, Solid State Physics and their possible applications.
3. They shall also understand the role of the physics in the development of newer innovations and technologies

Outcomes

1. Graduates will able to apply the knowledge of Physics in the field of Comminications, Electrodynamics, Solid State Physics and Optics.
2. The acquaintance of basic physics principles would help the engineers to develop or understand the working of different tools and devices
3. It equips the students with the fundamental knowledge of physics together with the problem solving skills and understanding.

UNIT I

OPTICS: Interference- Interference in thin films by reflection – Newton Rings. Diffraction- Fraunhofer diffraction due to single slit-Diffraction Grating.

MODERN OPTICS

Introduction to lasers – Characteristics of lasers – Spontaneous and stimulated emission of radiation – Einstein's coefficients – population inversion –Ruby laser - He-Ne laser Applications of laser. Introduction to fiber optics – Principle of optical fiber – Acceptance angle and acceptance cone – Numerical aperture – Classification of Optical Fibers- Attenuation in optical fibers – Optical fiber communication system- Applications of optical fibers.

UNIT II

CRYSTAL STRUCTURES AND X-RAY DIFFRACTION: Introduction – Space lattice – Basis – Unit cell – Lattice parameter – Crystal systems – Bravais lattices – Structure and packing fractions of Simple cubic, body centered cubic, face centered cubic crystals-Directions and planes in crystals – Miller Indices – Separation between successive [h k l] planes – Bragg's law-X-Ray Diffraction by Powder method

ULTRASONICS Introduction – Production of ultrasonics by piezoelectric method – Properties and detection of Ultrasonic waves – Applications in non-destructive testing.

UNIT III

PRINCIPLES OF QUANTUM MECHANICS: Wave and particles – de Broglie hypotheses – Matter waves – Schrödinger time independent wave equation – Physical significance of wave function – Particle in one dimensional box

FREE ELECTRON THEORY: Classical free electron theory – Equation for electrical conductivity - Quantum free electron theory – Fermi-Dirac distribution –Kronig-Penny model (qualitative)

UNIT IV

DIELECTRIC PROPERTIES: Introduction – Dielectric constant – Electronic, Ionic and Oriental polarizations (qualitative) – Local Field- Clausius - Mossotti equation – Piezoelectricity - Ferroelctricty.

MAGNETIC PROPERTIES

Introduction – magnetic moment – Classification of magnetic materials – Hysteresis curve – Hard and Soft Magnetic Materials-Applications.

UNIT V

SEMICONDUCTORS: Introduction – Intrinsic and extrinsic Semiconductors– Fermi level-Equation of conductivity - Drift and diffusion – Einstein's equation – Hall Effect.

SUPERCONDUCTORS: General properties of superconductors – Meissner effect – Penetration depth – Type I and Type II superconductors – Flux quantization – Josephson effect – Application of superconductors.

NANOMATERIALS: Introduction– Basic principles of nanomaterials – Growth of nanomaterials: Sol-Gel method-Chemical vapor deposition–Properties of nanomaterials-Carbon Nano Tubes -Application of carbon nano tubes and nanomaterials.

Text Books:

1. Avadhanulu and Kshirasagar A Text book of Engineering Physics, Revised Edition, S.Chand, New Delhi 2014
2. Gaur and Gupta:Engineering Physics, New Delhi, DhanpatRai Publishers, 2010
3. K. Thyagarajan: Engineering Physics,Delhi, Tata Mcgraw Hill Publishers, 2013.

Reference Books:

1. Pillai.S.O: Solid State Physics, 6thedition,New Delhi:New Age International, 2005.
2. Chattopadhyay, K.K; Banerjee,A.N: Introduction to Nano Science and Technology,New Delhi: PHI,2009 .
3. *Resnick, Halliday and Walker: Fundamentals of Physics, 9th Edition, New Delhi: Wiley Publishers, 2010.*

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I-B.Tech – I SEMESTER	**L**	**T**	**P**	**C**
	3	**1**	**0**	**3**

14AHS05 ENVIRONMENTAL SCIENCE

(Common to EEE, ECE, CSE & IT)

Objectives:

1. To study about conservation of natural resources, environmental monitoring & remediation, Industrial waste management and public health.
2. To develop analytical skills, critical thinking & demonstrate problem solving skills using scientific and engineering techniques.
3. To motivate the students to participate in environment protection and make man free from all sorts of environmental problems.

Outcomes:

After completion of the course the student will be able to

1. develop critical thinking (or) observation skills and apply them in the analysis of a problem (or) question related to the environment.
2. analyse and interpret the complex relationships between natural and human systems.
3. analyse and interpret the fundamental physical, chemical and biological principles that govern natural process.

UNIT-I

ENVIRONMENT AND NATURAL RESOURCE MANAGEMENT: Definition, Scope and Importance of Environmental Science, Need for Public Awareness, Components of Environment (Atmosphere, Hydrosphere, Lithosphere and Biosphere) Renewable and non-renewable Natural resources and associated problems: **Forest resources:** Use and over-exploitation, deforestation, case studies – Timber extraction, Mining, Dams and other effects on forest and tribal people. **Water resources:** Use and over utilization of surface and ground water, Floods, Drought, conflicts over water, dams-benefits and problems. **Food resources**: Sources of food, impacts of overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. **Energy resources:** Renewable and Non-renewable energy resources

UNIT-II

ECOSYSTEMS: Concept of an ecosystem, Structure and function of an ecosystem (Producers, Consumers and decomposers) – Energy flow in the ecosystem – Food chains, food webs and ecological pyramids – Ecological Succession.

TYPES OF ECOSYSTEMS:

a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem

d. Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT-III

BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition, Types of biodiversity (genetic, species and ecosystem diversity)- Bio-geographical classification of India, Values of biodiversity(Consumptive use, Productive use, Social use, Ethical use, Aesthetic and Option values)- India as a mega diversity nation-Hot spots of India-Threats to biodiversity(habitat loss, Poaching of wildlife, man-wildlife conflicts)-Endangered and endemic species of India-Conservation of biodiversity(In-situ and Ex-situ conservation of biodiversity).

UNIT-IV

ENVIRONMENTAL POLLUTION AND ACT'S: Definition, causes, effects and control measures of:
a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise Pollution e. Thermal Pollution f. nuclear hazards.

Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.

ACT'S: Environment Protection Act-Air (Prevention and Control of Pollution) Act-Water (Prevention and control of Pollution) Act-Wildlife Protection Act-Forest Conservation Act-

Disaster management: Floods, Earthquake, Cyclone and Landslides.

UNIT-V

SOCIAL ISSUES AND THE ENVIRONMENT: From unsustainable to sustainable development, Water conservation(rainwater harvesting, watershed management)-Resettlement and rehabilitation of people its problems and concerns, Environmental ethics, Global warming, Acid rain, Ozone layer depletion-Population growth, variation among nation, Population explosion-Family Welfare Programme-Environment and human health-Human Rights-Value Education-HIV/AIDS-Women and Child Welfare Programmes-Role of Information Technology in Environment and human health.

Field Work: Visit to local polluted site-Urban/Industrial.

Text Books:

1. Erach Bharucha, Textbook of Environmental Studies for Undergraduate courses by from UGC.
2. Dr.Raghavan Nambiar.K, Text Book of Environmental Studies,Sitech publications,2010.
3. Benny Joseph, Environmental Studies by Mc.GrawHill Publications, 2010.

References:

1. Dr.Suresh.K.Dhameja, Environmental Studies, S.K. Kataria & Sons Publishers, 2012.
2. *Sharma. J.P., Comprehensive Environmental Studies, Laxmi Publications, 2010.*

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I B.Tech, ECE I Semester

L	T	P	C
3	1	0	3

12AEE02 NETWORK THEORY

(Electronics and Communication Engineering only)

Objectives:

1. To understand the nature of different circuit elements, fundamental laws and network theorems, Electrical Circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline.
2. To understand about phasor concepts of single phase circuits, transient analysis and network topology.

Outcomes:

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

1. To apply the circuit concept in modeling of any physical system for steady state analysis.
2. Apply circuit analysis techniques in study of other courses like electrical circuits, design of network theorems, Two port networks and transient analysis

UNIT-I

INTRODUCTION TO ELECTRICAL CIRCUITS: Circuit Concept - R-L-C parameters - Voltage and Current sources - Independent and dependent sources – Source transformation – voltage & current relationship for passive elements – Kirchhoff's laws - Network reduction techniques – series, parallel, series-parallel combinations, star to delta or delta to star transformation, Node and mesh analysis.

UNIT –II

AC CIRCUITS: R.M.S and average values for different periodic waveforms, Steady state analysis of R, L and C (in Series, parallel and series parallel combinations) with sinusoidal excitation - Concept of self and mutual inductance - coefficient of coupling, series circuit analysis with mutual inductance, Resonance - series, parallel circuits, concept of band width and Q factor, Analysis of balanced three phase circuits.

UNIT –III

NETWORK THEOREMS: Superposition, Reciprocity, Thevinin's, Norton's and Maximum Power Transfer theorems (Statement without proof), problems using dependent and independent sources for DC and AC excitations.

UNIT –IV

TRANSIENT ANALYSIS: Transient response of R-L, R-C, R-L-C circuits (Series combinations only) for DC and sinusoidal excitations - Initial conditions - Solution using differential equation approach and Laplace transform methods.

UNIT –V

NETWORK TOPOLOGY & TWO-PORT NETWORKS

NETWORK TOPOLOGY: Concept of Graph - Tree, Basic cutset and Basic Tieset matrices for planar networks - Duality & Dual networks.

TWO-PORT NETWORKS: Z,Y,ABCD, h-parameters - Conversion of one parameter set to another - conditions for reciprocity and symmetry – Two port network connections in series, parallel and cascaded.

TEXT BOOKS:

1. Network Analysis- ME Van Valkenburg, Prentice Hall of India, 3rd Edition, 2000
2. Fundamentals of Electric circuits, Alexander and sadiku, Mc-graw Hill

REFERENCES:

1. Engineering Circuit Analysis- William Hayt and Jack E Kemmety, McGraw Hill, 5th Edition, 1993
2. Electric circuits-J.Edminister and M.Nahvi-Schaum's Outlines, TMH, 1999

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I B. Tech –I Semester	**L**	**T**	**P**	**C**
	3	**2**	**-**	**4**

14ACS02 PROGRAMMING IN C AND DATASTRUCTURES
(Common to EEE, ECE, CSE & IT)

Objectives:

The course presents basics of C programming including Data representation, Control Structures, Functions, Arrays, Pointers, Strings, Files, and Basic Data Structures that enables the students to:

1. Understand the basic components of computing environment.
2. Design and develop algorithms and flowcharts for solving a problem.
3. Be familiar with the importance of control flow statements in programming.
4. Know structured programming approach to solve real time applications.

Outcomes:

Upon completion of this course, students will be able to:

1. Apply the principles of structured programming in problem solving.
2. List out the salient features and applications of C programming language.
3. Demonstrate the techniques for implementing applications using C programming.
4. Know how to use basic data structure like array in simple data processing applications.

UNIT – I

Introduction to Computer Problem Solving, Algorithm/ Pseudo code, Flowchart and C Fundamentals

Introduction to Computer problem solving: What is computer, Block diagram of Computer, Hardware Vs Software, Types of Programming Languages, The Problem Solving aspect, Top Down design, Implementation of algorithms.

Algorithm, Flowchart: Fundamental algorithms- Exchanging the values of two variables, Factorial computation, Sign function computation, Reversing the digits of an integer, Generating prime numbers.

C Fundamentals : Structure of a C program, A simple C program, C character set, Identifiers and keywords, Data types, Constants, Variables, Operators- Classification of operators, Expressions- Precedence and Associativity, Evaluation of expressions, Standard library functions,

Statements - Input-Output statements (getchar, putchar, scanf, printf, gets and puts), Conditional statements (if, if-else, nested if, else-if ladder), Iterative Statements (for, while, do-while), Switch, Break, Continue, Goto statements with Simple C Programs , Compiling, Running and Debugging a C program.

UNIT – II

Functions, Arrays, and Strings

Functions: Defining a function, Accessing a function, Function prototypes, Passing arguments to a function, Parameter passing mechanisms - Call-by-value, Call-by-reference, Recursion, Storage classes (auto, static, register, extern), Macros.

Arrays: Declaration and Definition of an array, Processing an Array, Passing arrays to functions, Two-dimensional and Multi-dimensional arrays, Array techniques- Finding the k^{th} largest and Smallest element, Array order reversal, Removal of duplicates from an ordered array. **Strings** - Defining and Initialization of Strings, NULL character, Reading and Writing a string , Processing the string , String handling functions, Character arithmetic.

UNIT – III

Pointers, Structures and Unions

Pointers: Fundamentals, Pointer declarations, Passing pointer to a function, Pointers and One-dimensional array, Dynamic memory allocation, Operations on pointers, Arrays of pointers, Passing functions to other functions, More about pointer declarations.

Structures and Unions: Declaration, Definition and Initialization of structures, Accessing structures, User-defined data type (typedef), Nested structures, Structures and pointers, Passing structures to functions, Unions, Enumerated Data type (enum), Bit-fields.

UNIT – IV

Searching & Sorting, Files

Searching & Sorting: Linear and Binary search methods, Bubble sort, Selection sort, Insertion sort, Quick sort.

Files: Significance of files, Opening and Closing a data file, Reading and Writing a data file, Processing a data file, Unformatted data files, Concept of binary files, File handling functions, Additional features – Command line parameters, Preprocessor directives.

UNIT – V

Data Structures

Data Structures: Introduction to Data structures, Linear and Non-Linear data structures, Data abstraction, Stacks, Stacks using dynamic arrays, Queues, Circular queues using dynamic arrays, Evaluation of expressions using Stacks - Evaluating postfix expressions, Infix to Postfix conversion, Linked List - Singly linked list and chains, Representing chains in C, Doubly linked list and Circular linked list.

TEXT BOOKS

1. R.G. Dromey, "How to Solve it by Computer", Low Price Edition, Pearson Education India, 2008.
2. Behrouz A. Forouzan, Richard F. Gilberg, "C Programming & Data Structures", India Edition, Course Technology, 2010.

REFERENCES

1. D.A.Godse, A.P.Godse, "C Programming and Data Structures", First Edtion, Technical Publications, 2007.
2. Hanly, "Programming In C and Data Structures (For Jntu)", First Impression, Pearson Education India, 2009.
3. E Balagurusamy, "C PROG & DATA STRUCTURES-JNTU", Fourth Edition, Tata McGraw-Hill Education, 2009.
4. Yashavant P Kanetkar, "Let Us C (Computer science series)", 12th Edition, BPB Publications, 2010.

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I B.Tech-I SEMESTER **L T P C**

0 0 3 2

12AHS09 ENGINEERING PHYSICS LAB
(Common to EEE, ECE, CSE & IT)

Objectives:

1. To educate students about the basics of instrumentation, measurement, interpretation, and analysis.
2. To promote equipment/machinery handling skills and also to train the students with proper laboratory discipline.
3. To teach the behaviour of magnetic, semiconductor and optical materials/instruments and explain its properties and applications.

Outcomes:

1. They shall able to obtain and analyze scientific data from different physics laboratory instruments.
2. They shall develop their manipulative, observational and reporting skills.
3. The student will be able to understand many modern devices and technologies based on optics, electrodynamics, semiconductors, lasers and optical fibers.

ENGINEERING PHYSICSLAB:

A minimum of 10 experiments to be conducted during the academic year

1. Determine the wavelengths of given light source - Spectrometer.
2. Dispersive power of prism
3. Determine the wavelength of given laser source – Diffraction grating.
4. Determine the particle size by using laser source
5. Determine the thickness of thin wire by Interference.
6. Determine the radius of curvature of given plano convex lens by forming Newton Rings.
7. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
8. Numerical Aperture of an optical fiber.
9. Bending losses in Optical Fiber.
10. Determine the wavelength of Laser source by using optical fiber.
11. Determination of Hall Coefficient and Carrier concentration in the given Semiconductor.
12. Determine the energy loss of ferromagnetic sample by plotting B-H curve
13. Energy gap of a given semiconductor.
14. Determine the Dielectric constant of Barium Titanate.

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I B. Tech- I Semester

L	T	P	C
0	0	3	2

14AME03 ENGINEERING WORKSHOP

(Common to EEE, ECE, CSE & IT)

Objectives:

1. To understand the basic work shop tools and operations such as carpentry, fitting & sheet metal trades.
2. To understand the basic work tools of house wiring & house wiring connections etc.
3. To understand the basic joints and manufacturing processes such as foundry and welding.

Outcomes:

After completion of the study of this lab a student will be able to:

1. Distinguish between tools of various trades such as carpentry, fitting, sheet metal, welding, foundry & house wiring.
2. Explain the tools & connections pertaining to house wiring, stair case wiring etc.
3. To describe the use of carpentry & fitting joints such as lap, dovetail, mortise, tenon joint, various sheet metal models & manufacturing processes.

1. TRADES FOR EXERCISES:

a. Carpentry shop– Two joints (exercises) involving tenon and mortising, groove and tongue: Making T lap joint, cross lap joint, Dovetail lap Joint, mortise and tenon joint, T - Bridle joint from out of 300 x 40 x 25 mm soft wood stock

b. Fitting shop– Two joints (exercises) from: square joint, V joint, half round joint and dovetail joint out of 100 x 50 x 5 mm M.S. stock

c. Sheet metal shop– Two jobs (exercises) from: Tray, cylinder, hopper and funnel from out of 22 or 20 guage G.I. sheet

d. House-wiring– Two jobs (exercises) from: wiring for two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for Tube Light and wiring for a water pump with single phase starter.

e. Foundry– Preparation of two moulds (exercises): for a single Piece pattern and a Two Piece pattern.

f. Welding – Preparation of two welds (exercises): single V butt joint, lap joint, Square butt Joint and fillet weld.

2. TRADES FOR DEMONSTRATION:

a. Plumbing

b. Machine Shop

c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

REFERENCE BOOKS:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.

2. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas

3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
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I B. Tech-I SEMESTER	**L**	**T**	**P**	**C**
	-	**-**	**3**	**2**

14ACS04 C AND DATASTRUCTURES LAB
(Common to EEE, ECE, CSE & IT)

Objectives:

The main objective of conducting this lab is to enable the students to:

1. Know C programming development environment, compiling, debugging, linking and executing a program using the development environment.
2. Apply the syntaxes of control statements and loop structures.
3. Solve problems of repetitive nature using loop structures.
4. Analyze the complexity of problems, modularize the problems into small modules and then convert them into programs.

Outcomes:

After performing this lab, the students should be able to:

1. Confidently work on any C programming development environment.
2. Get practical knowledge about how to use concepts of C and Data structures for solving a problem.

3. Acquire and apply knowledge on pointers, memory allocation and files for dealing with variety of real world problems.

4. Compete the industry professional in analyzing and documenting a structured program by applying the coding standards.

Week l

a) Sum of the individual digits means adding all the digits of a number. Ex: 123, sum of digits is 1+2+3=6.
Write a C program to find the sum of individual digits of a positive integer.

b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are

0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.

Write a C program to generate the first n terms of the sequence.

c) Prime number is a number which is exactly divisible by one and itself only

Ex: 2, 3, 5, 7,……

Write a C program to generate all the prime numbers between 1 and n, where n is a value

supplied by the user.

Week 2

a) Write a C program to calculate the following: Sum=$1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$

b) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement).

Week 3

a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's

b) In converting roman numeral to decimal number, we have to take the roman value as input. This value is converted into a it's equivalent decimal number. Ex: X=10. Write a C program to convert a Roman numeral to its decimal equivalent.

Week 4

a) Write C programs that use both recursive and non-recursive functions

i) To find the factorial of a given integer. Factorial of a number is nothing but the multiplication of numbers from a given number to 1.

ii) To find the GCD (greatest common divisor) of two given integers. GCD means Greatest Common Divisor. i.e the highest number which divides the given number. Ex: GCD (12, 24) is 12.

Formula: GCD= product of numbers / LCM of numbers

b) Towers of Hanoi problem means we have three towers Here source, intermediate and destination are the three towers. We have to transfer all the disks from source to destination towers. Here the restriction is not to place a big disk on smaller one. for this we use intermediate tower. Finally the arrangements in the destination tower must be as same as the disks in the source tower at first.

Write C programs that use recursive function to solve the Towers of Hanoi problem.

Week 5

a) Write a C program to find both the largest and smallest number in a list of integers using Arrays.

b) Write a C program that uses functions to perform the following using Arrays:
i) Addition of Two Matrices ii) Multiplication of Two Matrices

Week 6

a) Write a C program that uses functions to perform the following operations:

i) To insert a sub-string in to a given main string from a given position.

ii) To delete n Characters from a given position in a given string.

b) Write a C program to determine if the given string is a palindrome or not.

Week 7

a) Write a C program that displays the position or index in the string S where the string T

begins, or – 1 if S doesn't contain T.

b) Write a C program to count the lines, words and characters in a given text.

Week 8

Write a C program that uses functions to perform the following operations:

i) Reading a complex number ii) Writing a complex number

iii) Addition of two complex numbers iv) Multiplication of two complex numbers

(Note: Represent complex number using a structure).

Week 9

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 of integers:

i) Linear search ii) Binary search

Week 10

Write a C program that implements the following sorting methods to sort a given list of

integers in ascending order

i) Bubble sort ii) Insertion Sort iii) Quick Sort

Week 11

a) Write a C program which copies one file to another.

b) Write a C program to reverse the first n characters in a file.

(Note: The file name and n are specified on the command line).

Week 12

a) Write a C program to display the contents of a file.

b) Write a C program to merge two files into a third file (i.e., the contents of the first file

followed by those of the second are put in the third file).

Week 13

Write C programs that implement Stack (its operations) using Arrays.

Week 14

Write C programs that implement Queue (its operations) using Arrays.

Week 15

Write a C program that uses functions to perform the following operations on singly linked

list: i) Creation ii) Insertion iii) Deletion iv) Traversal

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I B.Tech – II SEMESTER

L	T	P	C
3	0	0	3

14AHS01 TECHNICAL ENGLISH-I
(Common to EEE, ECE, CSE & IT)

OBJECTIVES:

1. To improve the language proficiency of the students in English with an emphasis on LSRW Skills.
2. To strengthen the students to study academic subjects through theoretical and practical components of the syllabus.
3. To comprehend the growing demand for English in the modern world.
4. To enumerate the aims of teaching English in India.

OUTCOMES:

1. The students will learn the language by observing the rules of grammar, vocabulary and composition that are necessary.
2. Students are made to appreciate the intelligent and innovative use of rules in order to be able to generate creative output in tune with the demands of industry and the corporate world.
3. After the course, the students will improve their power of comprehension and the ability to express themselves through listening, reading, speaking and writing.
4. The students will be able to distinguish between formal English and functional English.

Unit-I Emerging Technologies:

Solar Thermal Power-Cloud Computing

Unit-II Environmental Consciousness:

Climate Change- Green cover-Pollution

Unit-III Energy:

Renewable and Non-Renewable sources-Alternative sources-Conservation-Nuclear Energy

Unit-IV Engineering Ethics:

Challenger Disaster-Biotechnology-Genetic Engineering-Protection

From Natural Calamities

Unit-V Travel and Toursim:

Advantages and Disadvantages of Travel –Tourism - Atithi Devo Bhava-Tourism in India**.**

REMEDIAL GRAMMAR:

1. Articles
2. Prepositions
3. Time & Tense
4. Sentence Construction-Strategies (avoiding Repetition and ambiguity)
5. Sentence Transformation (Degrees, Voice, Speech & synthesis)
6. Common Errors in English

Vocabulary:

1. Roots-Prefixes-Suffixes(RPS Method)
2. Synonyms
3. Antonyms
4. Phrasal Verbs
5. Idioms
6. One-word substitutes

Writing Practice (Composition):

1. Paragraph-Writing(Descriptive, Narrative, Persuasive, Expository and Creative)
2. Summarizing
3. Note-Making and Note taking
4. Letter-Writing (Formal &Informal)
5. Report writing

Texts for classroom study:

(Prescribed Text book: Mindscapes-English for Technologies and Engineers, published by Orient Black Swan, 2012)

Reference Books:

1. M. Ashraf RizWi, **"Technical English Communication",** Tata Mc Graw Hill, Latest Edition.
2. V.R. Narayana Swamy, "Strengthen Your Writing", 1st edition, Orient longman, 2003.
3. Thomas Elliot Berry."The Most Common Mistakes in English Usuage", 1st Edition, Tata McGraw Hill, 2004.
4. Margaret M Maison,"Examine your English", 1st edition, Orient Longman, 1999.
5. Basic communication skills for Technology, Andrea J Rutherford, Pearson Education, Asia.
6. Technical communication by MeenakshiRaman Sangeetha Sharma, Oxford
7. Cambridge International of Phrasal Verbs, Cambridge.
8. Essential English Grammar by Martin Hewings, Cambridge
9. Oxford Practice Grammar by John Eastwood , Oxford.
10. English Pronouncing Dictionary by Daniel Jones Oxford.

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I B.Tech-II SEMESTER

L	T	P	C
3	1	0	3

14AHS06 ENGINEERING MATHEMATICS-II

(Common to EEE, ECE, CSE & IT)

Objectives:

The objectives of this course are to

1. conceptualise the basics and applications of matrices, interpolation, partial differential equations and transforms.
2. model a wide range of engineering and practical problems into any of the above suitable forms.
3. apply fundamental mathematical principles as well as computational techniques to the problems of engineering and scientific practice.

Outcomes:

After completion of the course the student will be able to

1. comprehend the areas of application of matrices, interpolation, partial differential equations and transforms.
2. apply the principles of matrices, curve fitting, partial differential equations, transforms etc. to the engineering and scientific problems.
3. obtain their solutions using various computational methods.

UNIT-I

MATRICES: Rank of a matrix-Echelon form, Normal form -solution of linear system of homogeneous and non-homogeneous equations -Gauss elimination method.

Eigen values and Eigen vectors - Cayley-Hamilton theorem - Linear Transformations - Orthogonal transformations -Diagonalization of a matrix. Quadratic forms- Reduction of Quadratic form to Canonical form and their nature.

UNIT-II

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction - The Bisection method - The method of false position - Newton - Raphson method.

Curve Fitting: Fitting a straight line - Second degree curve- Exponential curve - Power curve by method of least squares.

Interpolation: Forward Differences - backward differences-Newton's forward and backward differences formulae for interpolation - Lagrange's interpolation formula - Inverse interpolation .

UNIT-III

Numerical differentiation-First and second order derivatives- . Numerical integration-Trapezoidal rule - Simpson's 1/3 rule - Numerical solutions of ordinary differential equations by Taylor's series-Picard's method of successive Approximations - Euler's Method – Runge-Kutta Methods – Predictor - corrector method - Milne's method

UNIT-IV

FOURIER SERIES: Fourier series- Even and odd functions-Fourier series in an arbitrary interval - - Half-range Fourier sine and cosine expansions. Fourier integral theorem (statement) -Fourier sine and cosine integrals. Fourier Transforms - Fourier sine and cosine Transforms.

UNIT-V

PARTIAL DIFFERENTIAL EQUATIONS: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Method of separation of variables - solution of one dimensional wave equation, heat equation and two – dimensional Laplace's equation.

Z-TRANSFORMS: Inverse Z- transforms – Properties - Damping rule- Shifting rule - Initial and final value theorems. Convolution theorem - Solution of difference equations by Z- transforms.

Text Books:

1. Iyengar T.K.V., Krishna Gandhi.B and others, Mathematical Methods, New Delhi, S.Chand & company,2012.
2. Sankar rao G.,Kesav Reddy.E, Mathematical Methods, International publishing house,Pvt.ltd
3. Sastry .S.S., Introduction to Numerical analysis.New Delhi,Prentice Hall of India,2003
4. Dr..Grewal .B.S, Higher Engineering Mathematics,New Delhi,Khanna Publishers,2004

References:

1. Erwin Kreyszig ,Advanced Engineering Mathematics. John Wiley & Sons.
2. Jain.M.K, IyengarT.K.V,.Jain.R.K. Numerical Methods for Scientific and Engineering Computation. Newage International publishers.
3. Pal, Mathematical Methods ,Oxford University Press,2009.
4. Ranganatham.S,Prasad M.S.S.N.,Ramesh Babu.V, Numerical Analysis, S.Chand & company
5. Sankaraiah .C, Mathematical Methods, Vijayawada,V.G.S Book links,2007.

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I B.Tech-II SEMESTER

L	T	P	C
3	1	0	3

14AHS03 ENGINEERING CHEMISTRY

(Common to EEE, ECE, CSE, & IT)

Objectives:

1. To study the effect of hard water and its treatment for various purposes, corrosion and control of metallic materials,
2. To study the engineering materials such as refractories, lubricants & cement with its applications along with high polymers namely plastics, rubbers and their preparation, properties and applications.
3. To study the calorific value of fuels, combustion of fuels, working of batteries, recharging of batteries, application of different fuel cells.

Outcomes:

After completion of the course students will be able to understand

the impact of hard water and its removal, formation of corrosion, effect of corrosion *and designing of corrosion resistance articles.*
2. selection of suitable engineering materials for specific applications.
3. selection of suitable fuels, calculation of air requirements for combustion of fuel,

applications of different batteries and fuel cells.

UNIT – I: WATER TECHNOLOGY

Hardness of Water and its unit of expression – Estimation of hardness in water by EDTA titration method – Numerical problems – Effect of different water impurities (Hardness, Dissolved Oxygen and Chlorides) on boiler troubles – Water softening methods – zeolite process – Ion Exchange process – Demineralization of Brakish Water – Electrodialysis and Reverse Osmosis.

UNIT – II: CHEMISTRY OF CORROSION

Dry and Wet corrosion – causes of corrosion – mechanism of corrosion – Galvanic series – Galvanic and Concentration cell corrosion – Factors influencing the corrosion – Control of corrosion – Cathodic protection – Sacrificial anodic and Impressed current cathodic protection – Electro Plating and Electroless plating (Copper and Nickel).

UNIT – III: MATERIAL CHEMISTRY (Organic and Inorganic)

Organic (High Polymers)

Plastics: Thermosetting and thermoplastics – Engineering applications and properties of PE, PTFE, PVC, Nylon and Bakelite.

Rubbers: Processing of Natural Rubbers – Vulcanization – Compounding of Rubber – Synthetic Rubber – Buna S, Buna N, Silicone rubber properties and applications.

Inorganic (Refractories, Lubricants and Cement)

Refractories: Definition – Classification – Important properties of refractories (Refractoriness, RUL, Thermal stability, Porosity, Dimensional stability and Mechanical strength).

Lubricants: Definition – Function of Lubricants – Classification of Lubricants – Properties of Lubricants (Viscosity Index – Flash and Fire point – Cloud and Pour point – Aniline point – Neutralization number – Mechanical strength).

Cement: Definition – Composition – Classification of cements – Setting and Hardening of cement.

UNIT – IV: FUELS AND COMBUSTION

Fuels: Classification of Solid, Liquid and Gaseous fuels – Calorific value – HCV, LCV. Measurement of calorific value using Bomb calorimeter and Junkers gas calorimeter – Numerical problems – Fuel rating system – Octane and Cetane numbers and their influence on I.C. Engines.

Combustion: Combustion products and calculation of air requirement (numerical problems) – Flue gas analysis by Orsat's apparatus.

UNIT – V: ELECTROCHEMICAL CELLS

Electrochemical Cells – Standard electrode potential – Working principles and applications of different batteries – Dry cell, Lithium-ion cell, Lead-acid cell and Nickel-cadmium cell. Recharging of Batteries – Battery rating (A-h rating) – Working principles and applications of hydrogen-oxygen and methanol-oxygen fuel cells – Principle of solar cells.

Text Books:

1. Chemistry for Engineers by Prof. K.N.Jayaveera, Dr.G.V.Subba Reddy and Dr.C. Ramachandraiah, McGraw Hill Higher Education Hyd., 3rd edition, 2009.
2. A text book of Engineering Chemistry by S.S. Dara and S.S. Umare: S. Chand & Co. Ltd., 12th edition, 2010.
3. A text book of Engineering Chemistry by Jain & Jain: Dhanpat Rai Publishing Company, 15th edition, New Delhi, 2008.

Reference Books:

1. Engineering Chemistry by Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra: ScitechPublications(India) Pvt. Limted, Hyderabad, 2009.
2. Chemistry of Engineering Materials by C.V. Agarwal, C. Parameswara Murthy and Andra Naidu: BS Publications, Hyderabad, 9th edition, 2006.

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I B.Tech-II Semester	**L**	**T**	**P**	**C**
	2	**0**	**4**	**4**

14AME01 **ENGINEERING DRAWING**

(Common to EEE, ECE, CSE and IT Branches)

(First Angle Projection)

Objectives:

To understand

1. The importance of Engineering Drawing and get enhanced imagination capacity.
2. The Use of Engineering Drawing instruments and improve free hand Lettering.
3. The principles of orthographic projections and Preparation of pictorial drawings.

Out-Comes:

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

1. Prepare pictorial drawings as per the standards.
2. Communicate his/her ideas effectively by using orthographic projections.
3. Prepare the development of surfaces of engineering objects.

Introduction

Drawing Instruments and their uses, BIS conventions, Lettering, Dimensioning and free hand practicing. Geometrical constructions – construction of polygons – drawing tangents – dividing a line into number of equal divisions.

Unit-I

Principles of projection – both first and third angle – Projections of points – Projections of straight lines- lines inclined to both the principal planes, determination of true length and true inclinations.

Unit-II

Projections of planes – inclined to both the principal planes.

Projection of regular solids – prisms, Pyramids, cylinders, tetrahedron and cones – axis inclined to one plane.

Unit-III

Sections of solids such as prisms, pyramids, cylinders, tetrahedron and cones (solids in simple position) – True shape of the section.

Unit-IV

Principles of isometric projection – isometric scale – isometric projection of planes and solids – conversion of orthographic views into isometric views and vice- versa.

Unit-V

Development of surfaces of simple solids such as prisms, pyramids, cylinders, tetrahedron, cones and part solids.

Text Books:

1. Narayana K L and Kannaiah P, Engineering Drawing, Scitech Publications, Chennai 2012.

2. Bhatt N D and Panchal V M, Engineering Drawing, Revised Edition, Charotar Publications,2010.

REFERENCES:

1. Engineering Drawing, Johle, Tata McGraw-Hill, 2008.

2. Engineering Drawing, Shah and Rana, 2/e, Pearson Education, 2005.

FINAL EXAMINATION QUESTION PAPER PATTERN

(External Evaluation & Paper setting)

<u>Paper Setting:</u>

1. *Two questions to be set from each unit in either or choice (All Questions carries equal marks)*
2. *Student has to answer all questions.*

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	L	T	P	C
I-B.Tech II Semester	**3**	**1**	**-**	**3**

14AEC01 ELECTRONIC DEVICES AND CIRCUITS

(Common to ECE & EEE)

Objectives:

1. To understand operation of various Electronic devices such as Diodes, BJT, JFET and MOSFET.
2. To understand various applications of diode and special purpose electronic devices.
3. To understand the design of various biasing and amplifier circuits of BJT and JFET.

Outcomes:

1. Students will get working knowledge of various Semiconductor Devices like Diode, BJT, JFET, MOSFET, SCR & UJT.
2. Design and analyze the DC bias circuitry of BJT and FET.
   Design and analyze basic transistor amplifier circuits using BJT and FET.

UNIT-I

PN Junction Diode and its Applications**:**

PN Junction Characteristics, biasing- band diagrams and current flow, Diode current equations under forward bias and reverse bias conditions, Junction breakdown in diodes and breakdown voltages, effect of temperature on diode characteristics, Junction capacitance under forward bias and reverse bias, V-I characteristics and Specifications of Zener Diode, simple Zener voltage regulator and its limitation. Half wave, Full wave and Bridge rectifiers - their operation, performance characteristics, various filters and their importance and analysis of C-filter.

UNIT-II

Bipolar Junction Transistor:

Construction, Principle of Operation, V-I characteristics, Current components and current flow in BJT, Modes of transistor operation, Early effect, BJT input and output characteristics in CB, CE CC configuration, Various BJT biasing techniques, Thermal runway and Thermal Stabilization, Stability factors, Bias stabilization and Compensation techniques.

UNIT-III

Small Signal Transistors equivalent circuits: Small signal low frequency h-parameter model of BJT, Determination of h-Parameters from Transistor Characteristics, Measurement of h-Parameters, Analysis of CE, CB and CC configurations using exact h-parameters, Comparison of CB, CE and CC amplifier configurations.

UNIT-IV

Junction Field Effect Transistors (JFET): JFET Construction, Operation & Current flow, Pinch-off voltage, V-I characteristics of JFET. Various biasing circuits for JFET. Low frequency small signal model of JFET. Analysis of CS amplifier.

MOSFETs: MOSFET Construction, Operation & Current flow, V-I characteristics of MOSFET in Enhancement and Depletion modes.

UNIT-V

Special purpose Electronic Devices:

Principle of Operation, and Characteristics of Tunnel Diode, Varactor Diode, Schottky Barrier

Diode, Silicon Control Rectifier (SCR), Uni-Junction Transistor (UJT), Semiconductor photo devices - LDR, LED, Photo diodes & Photo transistors.

TEXT BOOKS:

1. J. Millman & Christos C. Halkias, Integrated Electronics, TMGH Edition, 2008.
2. R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson/Prentice Hall, 10th Edition, 2009.
3. David A.Bell, Electronic Devices and Circuits, 5th edition, Oxford University Press, 2008.

REFERENCES:

1. T.F. Bogart Jr., J.S.Beasley and G.Rico, Electronic Devices and Circuits, Pearson Education, 6th edition, 2008.
2. *J.Millman, C.C.Halkias, and Satyabratha Jit, Millman's Electronic Devices and Circuits, Tata McGraw Hill, 2nd Edition, 2008.*

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY, CHITTOOR
(AUTONOMOUS)

I B.Tech-II SEMESTER	**L**	**T**	**P**	**C**
	0	**0**	**3**	**2**

14AHS07 TECHNICAL ENGLISH LAB - I
(Common to EEE, ECE, CSE & IT)

The **Language Lab** focuses on the production and practice of sounds of language and equips students with the use of English in everyday situations and contexts.

Objectives:

1. To train students to use language effectively in everyday conversations and to participate in group discussions to help them face interviews, and sharpen public speaking skills.
2. To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning.
3. To enable them to learn better pronunciation following the principles of stress, intonation and rhythm.
4. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.

Outcomes:

1. The students will be able to recognize English sounds- Monophthongs, diphthongs and consonant sounds.
2. The students will appreciate and use correct pronunciation in English.
3. The pupils will distinguish between Received Pronunciation and Indian variety.
4. The lab course will make the students use English with correct stress and intonation patterns because English is a rhythmic language.

SYLLABUS:

The following course content is prescribed for the **English Language Laboratory** sessions.

Unit-I Organs of speech, speech mechanism, vowels, consonants, diphthongs, syllable division, word stress, intonation, phonetic transcription with support of speech solutions, dictionary practice with AHD & CALD software.

Unit-II Speaking of past, present & Future, Role play-Graded exercise with support of exercises from English Mastery, TOEFL Mastery & CALD Software.

Unit-III Functional English-I

Situational conversation-Grader exercises with support of Rosetta Stone Software

Unit-IV Functional English-II

Situational conversation-Grader exercises with support of Rosetta Stone Software

- *Greeting/Self-introduction*
- *Expressing the cause of something*
- *Describe a current situation*
- *Speaking traditions/customs/public issues*
- *Making plans for vacation*
- *Expressing of emotions*
- *Shopping –bargaining price and making purchases*
- *Making an appointment*
- *Naming foods and describing tastes*
- *Reporting other person's messages*
- *Requesting*
- *Asking for directions and describing*
- *Making suggestions, agreements and refusals*

Unit-V Group Discussions:

Do's and Don'ts of a G.D, Speaking on Knowledge based, controversial or abstract topics.

Reference Books:

1. English Language lab manual prepared by the Department of English
2. A Text Book of English Phonetics for Indian students by T. Balasubramaniyam, Macmillan Ltd., 2000.
3. Sasikumar.V and P.V. Dhamija,. Spoken English: A Self-Learning Guide to Conversation Practice. 34th Reprint. Tata MCGraw Hill. New Delhi,1993.
4. English Pronouncing Dictionary, Daniel Jones Current Edition with CD.
5. Spoken English, R.K. Bansal and J.B. Harrison, Orient Longman 2006 Edn.
6. Speaking English Effectively, Krishna Mohan & NP Singh (Macmillan)
7. A Practical course in English Pronunciation, (with two Audio cassettes) by J. Sethi, Kamlesh Sadan and & D.V. Jindal, Prentice- Hall of India Pvt.Ltd., New Delhi.
8. English Dictionary For Advanced Learners, (with CD) international edn. Macmillan 2009.
9. A Handbook for English Language Laboratories, E. Suresh Kumar, P. Sreehari, Foundation Books, 2009.
10. Delta's Key to the Next Generation TOEFL Test, 6 audio CDs, New Age International Publishers, 2007.

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I B.Tech- II SEMESTER	**L**	**T**	**P**	**C**
	0	**0**	**3**	**2**

14AHS08 ENGINEERING CHEMISTRY LAB

(Common to EEE, ECE, CSE & IT)

Objectives:

To make the student understand the

1. Process of estimation of metal ions like Iron, Copper and Calcium by titrometry; Evaluation of impurities like dissolved oxygen, oxidizable substances in water,
2. Process of determination of acidity and alkalinity of water sample, determination of lubricant properties like viscosity Index, Flash and Fire points,
3. Construction of simple phase diagram, determination of acid strength by conductometry and potentiometry.

Outcomes:

After completion of practical's student will be able to

1. use volumetric analysis for the estimation of metal ions, hardness of water, dissolve oxygen in water, chlorides in water, oxygen demand for water, alkalinity and acidity of water,
2. the importance of viscosity index, flash point and fire point of lubricants,
3. evaluation of eutectic temperature of binary system, the use of conductometer and potentiometer.

Any **TEN** of the following experiments

1. *Estimation of Hardness of water by EDTA method.*
2. *Estimation of Dissolved Oxygen in Water.*
3. *Estimation of Chlorides in Water sample.*
4. *Determination of Chemical Oxygen Demand.*
5. *Determination of Acidity of Water sample.*
6. *Determination of Alkalinity of Water sample.*
7. *Estimation of Copper by EDTA method.*
8. *Estimation of Ferrous Ion by Potassium Dichromate method.*
9. *Determination of Flash and Fire point by using Pensky Marten's apparatus.*
10. *Determination of viscosity of oils through Redwood viscometer No.1.*
11. *Determination of viscosity of oils through Redwood viscometer No.2.*
12. *Determination of Eutectic temperature of Binary system (Urea-Benzoic acid).*
13. *Acid- Base titration by Conductometric method.*
14. *Redox titrations by Potentiometry.*
15. *Titration of Strong acid vs Strong base by Potentiometry.*

Text Books:

1. *Chemistry Pre-lab manual by Dr K. N. Jayaveera and K.B. Chandra Sekhar, S.M. Enterprizes Ltd., 2007.*
2. *Vogel's Textbook of Quantitative Inorganic Analysis, ELBS Edition, 1994.*

Equipment Required:

1. *Glassware: Burettes, Pipettes, Standard Flasks, Beakers, Measuring jars, BOD bottles and Reagent bottles.*
2. *Analytical balance,*
3. *Reflux Condensers,*
4. *Pensky Marten's apparatus,*
5. *Redwood viscometer,*
6. *Bomb calorimeter,*
7. *Conductometer, Potentiometer.*

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	L	T	P	C
I-B.Tech II Semester	-	-	3	2

14AEC02 ELECTRONIC DEVICES AND CIRCUITS LAB
(Common to ECE & EEE)

Objectives:

1. To understand the working of diode, transistors and other special purpose electronics devices.
2. To understand the working of a rectifier circuit with and without filters.
3. To understand the bandwidth calculations of an amplifier circuit.

Outcomes:

At the end of the course, the student should be able to:

1. Analyze CE, CB and CS amplifiers and its bandwidth calculation.
2. Calculate various parameters from the characteristics of various electronic devices.
3. Know the importance of Filters and its calculations.

Electronic Workshop Practice:

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of active devices, Diodes, BJTs, JFETs, LEDs, LCDs, SCR, UJT.
3. Soldering Practice- Simple circuits using active and passive components.
4. *Study and operation of Ammeters, Voltmeters, Transformers, Analog and Digital* Multimeter, Function Generator, Regulated Power Supply and CRO.

List of Experiments

(For Laboratory Examination-Minimum of Twelve Experiments)

1. Study of CRO Operation and its Applications.
2. P-N Junction Diode Characteristics

   Part A: Germanium Diode (Forward bias& Reverse bias)

   Part B: Silicon Diode (Forward bias only)
3. Zener Diode Characteristics

   Part A: V-I Characteristics

   Part B: Zener Diode act as a Voltage Regulator

4. Rectifiers (without and with c-filter)

    Part A: Half-wave Rectifier
    Part B: Full-wave Rectifier

5. BJT Characteristics (CE Configuration)

    Part A: Input Characteristics

    Part B: Output Characteristics

6. BJT Characteristics (CB Configuration)

    Part A: Input Characteristics

    Part B: Output Characteristics

7. FET Characteristics (CS Configuration)

    Part A: Drain (Output) Characteristics

    Part B: Transfer Characteristics

8. SCR Characteristics.

9. UJT Characteristics.

10. LDR Characteristics.

11. LED Characteristics.

12. Transistor Biasing.

13. Frequency response of Common Emitter amplifier.

14. Frequency response of Common Collector amplifier.

15. Frequency response of Common Source amplifier.

Equipment required for Laboratory:

1. Regulated Power Supplies.
2. Analog/Digital Storage Oscilloscopes.
3. Analog/Digital Function Generators.
4. Digital Multimeter.
5. Decade Résistance Boxes/Rheostats.
6. Decade Capacitance Boxes.
7. Ammeters (Analog or Digital).
8. Voltmeters (Analog or Digital).
9. Active & Passive Electronic Components.
10. Bread Boards.
11. Connecting Wires.
12. CRO Probes etc.

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	L	T	P	C
B.Tech- II Year-I Sem ECE	**3**	**1**	**-**	**3**

14AHS11 ENGINEERING MATHEMATICS-III
(Common to EEE and ECE)

Objectives:

The main objectives of this course are to

1. To introduce the special functions like β , γ functions
2. To understand the concepts of complex numbers and residual theorems.
3. To comprehend the different series and different theorems in respect of residues and conformal mapping functions.
4. To apply the above concepts to engineering applications.

Outcomes:

After completion of the course the student will be able to

1. Understand simple closed contours and distinguish between the interior domain and the exterior domain which are separated by the simple closed contour.
2 .Learn and apply properties of contour integrals in Engineering.
3 .Apply the Cauchy's integral formula for engineering applications.
4. Understand and apply the Lowville's theorem, the mean-value property of a function and the maximum modulus principle in Engineering Sciences

UNIT I

SPECIAL FUNCTIONS: Gamma and Beta Functions - their properties - Evaluation of Improper Integrals – Bessel's functions – Properties, Recurrence relations. - Bessel's Integrals. Legendre's polynomials – properties – Rodrigue's formula, Recurrence relations - Orthogonality.

UNIT II

FUNCTIONS OF COMPLEX VARIABLE: Continuity-Differentiability-Analyticity-properties- Cauchy Riemann equations in Cartesian and polar coordinates-Harmonic conjugate harmonic functions-Milne Thompson method. Elementary Functions & their properties – e^z , sinz ,Cosz, logz and Coshz.

UNIT III

COMPLEX INTEGRATION: Line integral - Cauchy's integral theorem - Cauchy's integral formula. Generalized Cauchy's integral formula.
Power series - Expansion in Taylor's series Maclaurin's series and Laurent's series

UNIT IV

RESIDUES AND IMPROPER INTEGRALS:

Singular point - isolated singular point- pole of order m - Essential singularity. Residues -Residue theorem - Evaluation of integrals of the type

(a) improper real integrals $\int f(x)\,dx$ in $(-\infty,\infty)$
(b) $\int f(\cos\theta, \sin\theta)\,d\theta$ in $[c, c+2\Pi]$
(c) $\int e^{imx} f(x)\,dx$ in $(-\infty,\infty)$

UNIT V

ARGUMENT PRINCIPLE AND CONFORMAL MAPPING:

Argument Principle – Rouche's theorem – Determination of number of zeros of complex polynomials - maximum Modulus principle - Fundamental theorem of

algebra, Liouville's theorem. Conformal Mapping – Properties of conformal mapping- Translation-rotation - magnification and inversion – Special Transformations e^z , lnz ,z^2 , sinz, cosz ,sinhz,coshz - Bilinear transformation - Determination of bilinear transformation mapping three given points.

Text Books:

1. Iyengar T.K.V, Krishna Gandhi .B and others, A Text Book of Engineering Mathematics, Volume - III ,New Delhi, S. Chand & company, 2014.
2. Rukmangadachari. E., Kesava Reddy. E. A Text Book of Engineering Mathematics –III, Pearson Education, 2010.

References:

1. Ramana .B.V., A Text Book of Engineering Mathematics, New Delhi, Tata Mc Graw Hill, 2007.
2. B.S. Grewal, 'Higher Engineering Mathematics', 42nd Edition, Khanna Publications, 2013.
3. Ruel V Churchill and James Ward Brown, Complex Variables. Mc Graw-Hill Higher Education; 9 Edition 2013.
4. Erwin Kreysizing, Advanced Engineering Mathematics, 10th Edition, John Wiley & Sons, 2013.

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B.Tech- II Year-I Sem ECE	**3**	**1**	**-**	**3**

14AEC03 ELECTRONIC CIRCUIT ANALYSIS

Objectives:

To familiarize the student:

1. *With the analysis and design of multistage amplifiers.*
2. *With the analysis and design of amplifiers at low frequency and high frequency.*
3. *With the analysis and design of feedback amplifiers and oscillators.*
4. *With the analysis and design of various power amplifiers and tuned amplifiers.*

Outcomes:

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

1. ***Analyze and design multistage amplifiers.***
2. ***Analyze and design amplifier at LF and HF.***
3. ***Analyze and design various feedback amplifiers and oscillators.***
4. ***Analyze and design various power amplifiers and tuned amplifiers.***

UNIT I - MULTISTAGE AMPLIFIERS

Classification of Amplifiers, Analysis of CE, CB and CC using approximate models, Different Coupling Schemes used in Amplifiers- RC Coupled Amplifier, Direct and Transformer Coupled Amplifiers, Design of Single stage RC Coupled Amplifier Using BJT, Analysis of Cascaded RC Coupled BJT Amplifiers, Darlington Pair and Cascode Amplifier.

UNIT II

FREQUENCY RESPONSE

Logarithms, Decibels, General Frequency considerations, Frequency Response of BJT Amplifier, Analysis at Low and High Frequencies, Effect of Coupling and bypass Capacitors, the Hybrid-pi (π)-Common Emitter Transistor Model, CE short Circuit Current gain, Current gain with Resistive Load, Single Stage CE Transistor Amplifier response, Gain-Bandwidth Product.

UNIT III

ANALYSIS AND DESIGN OF FEEDBACK AMPLIFIERS AND OSCILLATORS

Concepts of Feedback, Classification of Feedback Amplifiers, General Characteristics of Negative Feedback Amplifiers, Effect of Feedback on Amplifier characteristics, Voltage Series, Voltage Shunt, Current Series and Current Shunt Feedback Configurations.

Conditions for Oscillations, RC and LC type Oscillators, RC-Phase shift and Wien-Bridge Oscillators, Generalized Analysis of LC Oscillators, Hartley and Colpitts Oscillators, Crystal Oscillators, Frequency and Amplitude Stability of Oscillators.

UNIT IV

POWER AMPLIFIERS

Classification, Series fed Class A Power Amplifier, Transformer Coupled Class A Amplifier, Efficiency, Push Pull Amplifier and Complementary Symmetry Class-B Power Amplifier, Crossover Distortion, Power Transistor Heat sinking, Class C Power amplifier.

UNIT V

TUNED AMPLIFIERS & VOLTAGE REGULATORS

Introduction, Q-Factor, Small Signal Tuned Amplifiers, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Cascading Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

Analysis of series and shunt regulators using BJT and Short circuit protection.

Text Books:

1. Jacob Millman, Christos C Halkias, "Integrated Electronics", Mc Grawhill.
2. Robert L.Boylestad, Louis Nashelsky, "Electronic Devices and Circuit Theory", Pearson Education, 9th edition, 2008

Reference Books:

1. Donald A Neamen, "Electronic Circuits Analysis and Design", Tata McGraw- Hill,Third Edition, 2009.
2. Sedra, Kenneth, Smith, "Microelectric circuits", Oxford University Press, 5th edition, 2011.
3. Mohammad H. Rashid, "Electronic Circuit and Applications", CENGAGE Learning.

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	L	T	P	C
B.Tech- II Year-I Sem ECE	**3**	**1**	**-**	**3**

14AHS12 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to All Branches)

Objectives:

1. Comprehend the fundamental concepts and theoretical principles of the Economics
2. *The course equips the students to develop an economic way of thinking in dealing with practical business problems and challenges*
3. Identify the basic economic events most common in business operations
4. *Also enable the students by providing the basic knowledge of book keeping, accounting and make analysis of financial statements of a business organization.*

Outcomes:

After the completion of the course student will be able to

1. *Gain knowledge on managerial economics*
2. *Develop an understanding of economic principles and to enhance skills in high-level problem solving and critical thinking*
3. *Evaluate the economic environment and the impact of governmental economic policies on consumers and financial institutions.*
4. *Know the application of financial accounting in the field of Engineering.*

UNIT – I

INTRODUCTION TO MANAGERIAL ECONOMICS

Managerial Economics: Definition, Nature and Scope – Demand analysis: Law of demand, Demand determinants, Elasticity of Demand: Definition, Types, Measurement and Significance – Demand forecasting methods (Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach)

UNIT – II

THEORY OF PRODUCTION AND COST ANALYSIS

Production function – Cobb Douglas Production function – Laws of Returns – Internal and External economies of scale **COST ANALYSIS:** Cost concepts, Fixed vs. Variable costs, Explicit vs. Implicit Costs, Out of Pocket costs Vs Imputed costs, Opportunity Cost and Sunk costs **BREAK EVEN ANALYSIS:** Concept of Break Even Point (BEP) – Break Even Chart – Assumptions underlying and Practical significance of BEP (Simple Problems).

UNIT – III

INTRODUCTION TO MARKETS AND BUSINESS ORGANIZATIONS:

Market structures – Types of Competition – Features of perfect competition, Monopoly, Monopolistic competition – Price-Output Determination under perfect competition and Monopoly – Types of Business organization – Features, Merits and demerits of Sole proprietorship, Partnership and Joint stock companies – Types of companies – Public enterprises –Types and Features – Changing business environment in post – Liberalization scenario.

UNIT – IV

CAPITAL AND CAPITAL BUDGETING:

Capital and its Significance – Types of capital – Estimation of fixed and working capital requirements – Methods and sources of raising capital – Capital Budgeting Methods**:** Payback Method, Accounting Rate of Return (ARR), and Net Present Value (NPV) Method (Simple Problems).

UNIT –V

FINANCIAL ACCOUNTING AND FINANCIAL ANALYSIS THROUGH RATIOS:

Double entry book keeping – Journal – Ledger – Trial Balance –Trading Account and balance sheet with simple adjustments **Ratio analysis:** Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt- Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Aryasri A. R., Managerial Economics and Financial Analysis, 4/E, TMH, 2009.
2. Varshney R.L. and K.L. Maheswari, Managerial Economics, Sultan Chand & Sons, 19/E, 2009.
3. Siddiqui S.A. and Siddiqui A.S., Managerial Economics and Financial Analysis, New Age international, 2009.

REFERENCES:

1. Gupta R.L., Financial Accounting, Volume I, Sultan Chand & Sons, New Delhi, 2001
2. James C. Van Horne, Financial Management policy, 12/E, PHI, 2001.
3. Joel Dean, Managerial Economics, PHI, 2001.

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B.Tech- II Year-I Sem ECE	**3**	**1**	**-**	**3**

14AEC04 PROBABILITY THEORY AND STOCHASTIC PROCESSES

Objectives:

To familiarize the student:

1. Basic concepts of probability and conditional probability.
2. To deal with single and multiple random variables, joint distribution, expectation, and independence.
3. Analysis of random process and application to the signal processing in the communication system.
4. To understand Temporal and Spectral characteristics of Random Processes.

Outcomes:

1. *This course provides a foundation in the theory and Applications of probability and stochastic processes. Students are able to understand the mathematical techniques relating to random processes which are applicable in the areas of Communications, signal processing.*
2. *A student will able to determine the temporal and spectral characteristics of random signal response of a given linear system.*
3. *Students are able to analyze the random phenomenon of any physical system.*
4. *Students are able to understand the mathematical techniques relating to random processes which are applicable in the areas of detection & estimation of signals.*

UNIT I

Probability: Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bays' Theorem, Independent Events:

The Random Variable : Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Raleigh, Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties.

UNIT II

Multiple Random Variables: Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density–Point Conditioning, Conditional Distribution and Density – Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, (Proof not expected). Unequal Distribution, Equal Distributions.

Operations on Multiple Random Variables: Expected Value of a Function of Random Variables, Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

UNIT III

Random Processes–Temporal Characteristics: The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second- Order and Wide-Sense Stationarity, (N-Order) and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and Its Properties, Cross-Correlation Function and its Properties, Covariance Functions, Gaussian Random Processes, Poisson Random Process.

UNIT IV

Random Processes–Spectral Characteristics (For Continuous random process only) : The Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

UNIT V

Linear Systems with Random Inputs: Random Signal Response of Linear Systems: System Response–Convolution, Mean and Mean-squared Value of System 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, noise band width, Band pass, Band limited & Narrow Band Random process

Text Books:

1. Peyton Z. Peebles, "Probability, Random Variables & Random Signal Principles", TMH,

4th Edition, 2001.

2. Athanasios Papoulis and S. Unnikrishna Pillai, "Probability, Random Variables and

Stochastic Processes", PHI, 4th Edition, 2002.

Reference Books:

1. R.P. Singh and S.D. Sapre, "Communication Systems Analog & Digital", TMH, 1995.
Henry Stark and John W.Woods, "Probability and Random Processes with Application
to Signal Processing",Pearson Education, 3rd Edition.
2. George R. Cooper, Clave D. MC Gillem, "Probability Methods of Signal and SystemAnalysis", Oxford, 3rd Edition, 1999.
3. S.P. Eugene Xavier, "Statistical Theory of Communication", New Age Publications, 2003.

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	L	T	P	C
B.Tech- II Year-I Sem ECE	**3**	**1**	**-**	**3**

14AEC05 SWITCHING THEORY AND LOGIC DESIGN
(Common to ECE and EEE)

Objectives:

To familiarize the student:

1. To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.

2. To introduce basic postulates of Boolean algebra and show the correlation between Boolean expressions.
3. To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits.
4. To illustrate the concept of synchronous and asynchronous sequential circuits.

Outcomes:

After completion of the course, the student will be able to:
1. Design and Analyze combinational and sequential circuits for various practical problems using basic gates and flip flops.
2. Implement LSI and MSI circuits using programmable logic devices (PLDs).
3. Demonstrate knowledge of hazards and race conditions generated within asynchronous circuits.
4. Implement synchronous state machines using flip-flops.

UNIT I

NUMBER SYSTEM & BOOLEAN ALGEBRA

Digital systems, Binary Numbers, Number base conversions, Complements of numbers, Signed Binary numbers, Binary codes. Boolean algebra - Basic definition, Basic theorems and properties, Boolean Functions, Canonical & Standard forms, other logic operations & Digital logic gates.

UNIT II

GATE LEVEL MINIMIZATION

The map method, four variable K-map, five variable K-map, POS & SOP Simplification, Don't care conditions, NAND & NOR Implementation, Other two-level Implementations, Exclusive-OR Function, Tabular Method-Simplification of Boolean function using tabulation Method.

UNIT III

ANALYSIS AND SYNTHESIS OF COMBINATIONAL CIRCUITS

Combinational circuits, Analysis & Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude comparator, Decoder, Encoders, Multiplexers, De-multiplexers, Code Converters.

UNIT IV

ANALYSIS AND SYNTHESIS OF SEQUNTIAL CIRCUITS

Sequential Circuits, Latches, Flips-Flops, Analysis of Clocked sequential circuits, State Reduction & Assignment, Design procedure, Registers & Counters – Registers, Shift Registers, Ripple Counters, Synchronous counters, other counters.

UNIT V

Asynchronous sequential Logic & Programmable Memories

Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and flow tables, Race-free State Assignment, Hazards. Random Access Memory, Memory Decoding, Error detection and correction, ROM, PLA, PAL.

Text Books:

1. M.Morris Mano & Michel D. Ciletti, "Digital Design", Pearson, 5th Edition.

2. Zvi Kohavi and Nirah K.Jha, "Switching theory and Finite Automata Theory",

Cambridge, 3rd Edition

Reference Books:

1. Subratha Goshal, "Digital Electronics", Cambridge.

2. Comer, "Digital & State Machine Design", Third Indian edition, OXFORD.

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	L	T	P	C
II B.Tech - I Semester ECE	**3**	**1**	**-**	**3**

14AEC06 SIGNALS AND SYSTEMS
(Common to EEE & ECE)

Objectives:

1. To introduce theory to qualify and quantify signals and systems.
2. To do analysis of signals & systems using time domain & frequency domain methods.
3. To understand the concept of ROC in Laplace and Z-transforms.
4. To know various transform techniques in the analysis of signals and systems.

Outcomes:

1.For integro-differential equations, the students will have the knowledge to make use of Laplace transforms.
2.For continuous time signals the students will make use of Fourier transform and Fourier series.
3.For discrete time signals the students will make use of Z transforms.
4.The concept of convolution is useful for analysis in the areas of linear systems and communication theory.

UNIT I

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, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS : Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum

UNIT II

FOURIER TRANSFORMS : Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function.

LAPLACE TRANSFORMS : Review of Laplace transforms(L.T), 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 L.T's, Relation between L.T's and F.T. of a signal .

UNIT III

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear system, impulse response, Response of a linear system, Linear Time Invariant (LTI) 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.

UNIT IV

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto

correlation function and energy/power spectral density function, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT V

SAMPLING: Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing.

Z–TRANSFORMS: Concept of Z- Transform of a discrete sequence. Region of convergence (ROC), properties of Z-transforms, Inverse Z-transform-Long Division method, partial fraction method, convolution method.

TEXT BOOKS:

1. B.P. Lathi, Signals, Systems & Communications, BS Publications, 2009.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, Signals and Systems, PHI, 2nd Edition.
3. Simon Haykin and Van Veen, Signals & Systems, Wiley, 2nd Edition.

REFERENCES:

1. A. Ramakrishna Rao, Signals and Systems, 2008, TMH.
2. B.P.Lathi, Linear Systems and Signals, 2nd Edition, Oxford University Press, 2008.
3.Anand kumar , Signals and Systems,PHI

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B.Tech- II Year-I Sem ECE	**-**	**-**	**3**	**2**

14AEC08 ELECTRONIC CIRCUITS LAB
(12 experiments to be done)

Objectives:

To familiarize student with

1. *Design and Simulation of various amplifier circuits.*
2. *Design and Simulation of various feedback amplifier and power amplifier circuits.*
3. *Design and testing of various amplifier circuits.*
4. *Design and testing of various oscillator circuits.*

Outcomes:

After the completion of the lab, the student

1. *Will be able to analyze, design and simulate various amplifier circuits.*
2. *Will be able to analyze, design and simulate various feedback amplifier and power amplifier circuits.*
3. *Will be able to analyze, design and test various amplifier circuits.*
4. *Will be able to analyze, design and test various oscillator circuits.*

I) Design and Simulation in Simulation Laboratory using any SimulationSoftware.

(Minimum of 6 Experiments):

1. Common Emitter Amplifier
2. Common Source Amplifier
3. A Two Stage RC Coupled Amplifier.
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascade Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class-A Power Amplifier (Transformer less)
9. Class-B Complementary Symmetry Amplifier
10. High Frequency Common base (BJT) / Common gate (JFET) Amplifier.

II) Testing in the Hardware Laboratory (6 Experiments)

Any Three circuits simulated in Simulation laboratory
Any Three of the following

1. Class-A Power Amplifier (with transformer load)
2. Class-C Power Amplifier
3. Single Tuned Voltage Amplifier
4. Hartley & Colpitt's Oscillators.
5. Darlington Pair.
6. MOSFET Amplifier

III) Equipments required for Laboratories:

For software simulation of Electronic circuits
Computer Systems with latest specifications.
Connected in LAN (Optional).
Operating system (Windows XP).
Suitable Simulations software.
For Hardware simulations of Electronic Circuits
Regulated Power Supply (0-30V)
CRO's
Functions Generators.
Multimeters.
Components.

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	L	T	P	C
B.Tech- II Year-I Sem ECE	**-**	**-**	**3**	**2**

14AEC09 SIGNALS AND SYSTEMS LAB

Objectives:

1.The course intends to provide an overview of signal analysis.
2.This course relies on elementary treatment and qualitative analysis of Fourier Transform, Laplace Transform and Z-Transforms
3.To provide an overview of signal transmission through linear systems, convolution and correlation of signals and sampling.

Outcomes:

1. Determine the mathematical representation and classification of signals and systems. Should be able to represent signal in terms of mutually orthogonal signals.
2. Determine the response of an LTI system using convolution and classical methods. Analyze system properties based on impulse response.
3. Determine and analyze the responses of LTI system to arbitrary time signals using Fourier transform.
4. Should be able to state sampling theorem and its application and convolution and correlation of signal.

Note: Minimum 14 experiments are to be done using MATLAB

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 function.
3. Operations on Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average power.
4. Finding the Even and Odd parts of Signal or Sequence and Real and Imaginary parts of Signal.
5. Convolution between Signals and Sequences.
6. Autocorrelation and Cross correlation between Signals and Sequences.
7. Verification of Linearity and Time Invariance properties of a Given Continuous / Discrete System.
8. Computation of Unit Sample, Unit Step and Sinusoidal Responses of the given LTI system and verifying its Physical Realizability and Stability properties.
9. Gibbs phenomenon.
10. Finding the Fourier Transform of a given Signal and plotting its Magnitude and phase Spectrum.
11. Waveform Synthesis using Laplace Transform.
12. Locating Zeros and poles, and plotting the Pole-Zero maps in S-Plane and Z-Plane for the given Transfer Functions.
13. Generation of Gaussian Noise (Real and Complex), Computation of its Mean, M.S. Values and its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Sampling Theorem Verification.
15. Removal of Noise by Auto Correlation / Cross correlation in a given signal corrupted by noise.

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	L	T	P	C
II B.Tech –II Semester ECE	**3**	**1**	**-**	**3**

14AEE15 ELECTRICAL TECHNOLOGY

Objectives:

1. *To know operating principles, characteristics and testing of dc machines.*
2. *To understand the principle of operation of single phase Transformers.*
3. *To understand the principle of operation of single phase and three phase induction motors and alternator.*
4. *To know the basic principles of Electrical Measuring Instruments.*

Outcomes:

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

1. *Acquire the knowledge of operation and applications of different types of DC & AC machines.*
2. *Acquire the knowledge about working principle and testing of transformers.*
3. *Understand the operation of single phase and three phase induction motor and alternator.*
4. *Know the working principle of measuring instruments.*

UNIT I

DC MACHINES: Construction details, Principle of operation - EMF equation – Types of generators – Magnetization and load characteristics of DC generators - DC Motors – Types of DC Motors – Characteristics of DC motors – Three point starter –Swinburne's test – Losses and efficiency – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT II

TRANSFORMERS: Constructional features - types - Principle of operation of single phase transformer - Phasor diagram on No-Load and Load condition – Equivalent circuit – OC and SC tests – Losses and Efficiency of transformer and Regulation - Predetermination of efficiency and regulation - Simple Problems.

UNIT III

THREE PHASE INDUCTION MOTOR: Principle of operation – Slip ring and Squirrel cage motors – Slip-Torque characteristics – Efficiency calculation – Starting methods.

SINGLE PHASE INDUCTION MOTORS: Principle of operation - Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors and their Characteristics.

UNIT IV

ALTERNATORS: Constructional features – Principle of operation – Types - EMF Equation – Distribution and Coil span factors – OC and SC tests - Predetermination of regulation by Synchronous Impedance Method.

UNIT V

ELECTRICAL INSTRUMENTS: Basic Principles of indicating instruments – Moving Coil and Moving iron Instruments (Ammeters and Voltmeters)-Wattmeter, Energy meter and P.F meter.

Text books:

1. M.S Naidu and S. Kamakshaiah: Introduction to Electrical Engineering, TMH Publication.
2. T.K. Nagasarkar and M.S.Sukhija: Basic Electrical Engineering, Oxford University Press, 2005

References:

1. V.K Mehta: Principles of Electrical Engineering, S.Chand Publications.
2. I.J. Nagarath amd D.P Kothari: Theory and Problems of basic electrical engineering, PHI Publications
3. HUGHES: Electrical and Electronic Technology, Pearson Publications.

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14AEC10 ANALOG COMMUNICATIONS

Objectives:

1. To study the fundamental concept of the analog communication systems.
2. To analyze various analog modulation and demodulation techniques.
3. To know the working of various transmitters and receivers.
4. To understand the influence of noise on the performance of analog communication systems.

Outcomes:

The Students will be able to

1. Acquire knowledge on the basic concepts of Analog Communication Systems.
2. Analyze the analog modulated and demodulated systems.
3. Verify the effect of noise on the performance of communication systems.
4. Analyze the pulse analog modulation and demodulation techniques.

UNIT I:

INTRODUCTION:

Elements of communication Systems - information, Messages and Signals, Fundamental Limitations of communication Systems, Modulation, Modulation Benefits and Applications

LINEAR CONTINUOUS WAVE (CW) MODULATION:

Double Side Band Amplitude Modulation – AM Signals and Spectra, DSB Signals and Spectra, Tone Modulation and Phasor Analysis, Modulators and Transmitters – Product Modulators, Square Law Modulators , Balanced Modulators and Switching Modulators.

Suppressed Side Band Amplitude Modulation - Single Side Band Signals and Spectra, Single Side Band Generation, Vestigial Side Band Signals and Spectra, Frequency Conversion and Demodulation –Frequency Conversion, Synchronous Detection, Envelope Detection.

UNIT II:

ANGLE CONTINUOUS WAVE (CW) MODULATION:

Phase and Frequency Modulation – PM and FM Signals, Narrow Band PM and FM, Tone Modulation, Multi Tone and Periodic Modulation, Transmission Bandwidth and Distortion – Transmission Estimates, Non-Linear Distortion and Limiters.

Generation and Detection of PM and FM – Direct FM and VCOs, Phase Modulators and Indirect FM, Triangular wave FM, Frequency Detection, Pre-Emphasis and De-Emphasis Filtering, FM Capture Effect.

UNIT III:

ANALOG COMMUNICATION SYSTEMS:

Receivers for CW Modulation – Super Heterodyne receivers, direct conversion receiver, special purpose receivers, Receiver Specifications, Receiver Measurements, Multiplexing Systems, Synchronous detection and frequency synthesizers using Phase Locked Loop (PLL), Linearized PLL FM detection.

UNIT IV:

NOISE:

Thermal Noise & Available Power, White noise and filtered noise, Noise equivalent bandwidth, base band signal Transmission with noise- Additive Noise & S/N, Analog Signal Transmission, Noise in Analog Modulation Systems- Band Pass Noise System Models, Quadrature Components, envelope phase, Correlation Functions, Linear CW Modulation with Noise – Synchronous Detection, Envelope Detection, and Threshold Effect, Angle CW with Noise, Post detection Noise, Destination S/N, FM Threshold Effect.

UNIT V:

PULSE ANALOG MODULATION:

Sampling of continuous time signals. Sampling of low pass and band pass signals. Types of sampling. Pulse Amplitude Modulation (PAM) generation and detection. Pulse time modulation schemes: PWM and PPM generation and detection.

TEXT BOOKS:

1. A. Bruce Carlson, & Paul B. Crilly, "Communication Systems – An Introduction to Signals
& Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.
2. Sam Shanmugam, "Digital and Analog Communication Systems", Wiley-India edition, 2006.

REFERENCES:

1. Simon Haykin, "Communication Systems," 4th Edition, Wiley India, 2011
2. Singh, R.P. and Sapre, S.D., "Communication Systems," TMH, 2007
3. George Kennedy and Bernard Davis, "Electronics & Communication System", TMH, 2004

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B.Tech- II Year-II Sem ECE	**3**	**1**	**-**	**3**

14AEC11 PULSE AND DIGITAL CIRCUITS

Objectives:

To familiarize the student:

1. *With various wave shaping circuits and their applications.*
2. *With different circuits that produce non-sinusoidal waveform and their applications*
3. *With various voltage time base generators and their applications.*
4. *With different logic families and their comparison.*

Outcomes:

After the completion of the course, the student:

1. *Will be able to understand various linear wave shaping circuits and their applications.*
2. *Will be able to understand various non-linear wave shaping circuits and their applications.*
3. *will be able to analyze and design various multivibrator circuits and time base generators.*
4. *Will be able to understand operation of various sampling gates and digital logic gates.*

UNIT I

LINEAR WAVESHAPING

High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. High Pass RC network as Differentiator, Low Pass RC network as integrator, attenuators and its applications as a CRO probe, RL circuit and its response for step input.

UNIT II

NON-LINEAR WAVE SHAPING

Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, applications of voltage comparators, clamping operation, clamping circuits taking source and Diode resistances into account, Clamping circuit theorem, practical clamping circuits and effect of diode characteristics on clamping voltage.

UNIT III

MULTIVIBRATORS

Transistor as a switch, Break down voltages, Transistor-Switching Times, Triggering circuits. Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger circuit using BJT.

UNIT IV

TIME BASE GENERATORS

General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles,

Transistor miller time base generator, Transistor Bootstrap time base generator, Transistor Current time base generators.

SYNCHRONIZATION AND FREQUENCY DIVISION

Pulse Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation Devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals.

UNIT V

SAMPLING GATES

Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Four Diode Sampling Gate, Reduction of pedestal in gate circuits, Six Diode Gate, Application of Sampling Gates.

Digital Logic Circuits

AND, OR, NOT, NAND and NOR gates using RTL and DTL families.

Text Books:

1. J.Millman, H.Taub and Mothiki S. Prakash Rao, " Pulse, Digital and Switching Waveforms", TMH ,2nd Edition, 2008.
2. David A. Bell, "Solid State Pulse Circuits", PHI, 4th edition, 2002.

Reference Books:

1. Jacob Millman, Christos C. Halkias, "Integrated electronics" Tata McGraw Hill Publication
2. A. Anand Kumar, "Pulse and Digital Circuits", PHI, 2005.
3. Ronald J. Tocci, "Fundamentals of Pulse and Digital Circuits", 3rd edition, 2008.

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14AEC12 LINEAR IC APPLICATIONS

Objectives:

To familiarize the student
1. With the analysis and design of various differential amplifier circuits.
2. With various negative feedback circuit in an op-amp.
3. With various applications of op-amp.
4. With various D/A and A/D converters.

Outcomes:

The student will be able to:
1. Analyze and Design various differential amplifier circuits.
2. Analyze and Design various circuits using negative feedback.
3. Design and analysis various applications of op-amp.
4. Analyze various D/A and A/D converters.

UNIT I

DIFFERENTIAL AMPLIFIERS AND OPAMPS

Differential Amplifiers: Differential amplifier configurations, Balanced and unbalanced output differential amplifiers, current mirror, level Translator.

Operational amplifiers: Introduction, Block diagram, Ideal op-amp, Equivalent Circuit, Voltage Transfer curve& open loop op-amp configurations.

UNIT II

OP-AMP WITH NEGATIVE FEEDBACK AND FREQUENCY RESPONSE

Introduction, feedback configurations, voltage series feedback, voltage shunt feedback and differential amplifiers, features of Practical op-amp.

Frequency response: Introduction, compensating networks, frequency response of internally compensated op-amps and non compensated op-amps, High frequency op-amp equivalent circuit, open loop gain Vs frequency, closed loop frequency response, circuit stability and slew rate.

UNIT III

OP-AMP APPLICATIONS -1

DC and AC amplifiers, peaking amplifier, summing, scaling and averaging amplifiers,

Instrumentation amplifier, voltage to current converter, current to voltage converter, integrator, differentiator, first order LPF and HPF.

UNIT IV

OP-AMP APPLICATIONS -2

Oscillators, Phase shift and wein bridge oscillators, Square, triangular and sawtooth wave generators, Comparators, and its types , Schmitt trigger, characteristics and limitations.

Specialized applications: 555 timer IC (monostable & astable operation) & its applications, PLL, operating principles and its applications, IC regulators (78XX, 79XX, LM317, LM337, LM723).

UNIT V

ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS

Analog and Digital Data Conversions, D/A converter – specifications – weighted resistor type, R-2R Ladder type Inverted R-2R Ladder type DAC,switches for D/A converters, high speed sample-and-hold circuits, A/D Converters –specifications – Flash type –Successive Approximation register type – Single Slope type – Dual Slope type and Counter types.

TEXT BOOKS:

1. D. Roy Chowdhury, "Linear Integrated Circuits", New Age International (p) Ltd, 2nd Edition,2013.
2. Ramakanth A. Gayakwad, "Op-Amps & Linear ICs", PHI, 4th edition,2010

REFERENCES:

1. R.F.Coughlin & Fredrick Driscoll, "Operational Amplifiers & Linear Integrated Circuits", 6th Edition, PHI.
2. David A. Bell, "Operational Amplifiers & Linear ICs", Oxford University Press, 2nd edition, 2010.
3. Sergio Franco, "Design with Operational Amplifiers & Analog Integrated Circuits" McGraw Hill, 2010

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14AEC13 DIGITAL IC APPLICATIONS

Objectives:

1.Define a hardware design utilizing the three basic VHDL modeling styles: Data flow, Structural and Behavioral.
2.Design a Combinational Logic Circuit and Sequential Logic Circuit utilizing VHDL.
3.To be able to use computer-aided design tools for development of complex digital logic Circuits
4. To be able to model, simulate, verify, analyze, and synthesize with hardware description languages

Outcomes:

1.The student will understand the basics of VHDL and design digital systems using a hardware description Language, VHDL.
2.Able to use computer-aided design tools for development of complex digital logic circuits.
3.Able to model, simulate, verify, analyze, and synthesize with hardware description languages.
4. Able to design and prototype with standard cell technology and programmable logic.

UNIT I - CMOS LOGIC:

Introduction to logic families, CMOS logic, CMOS Steady State Electrical Behavior, CMOS Dynamic Electrical Behavior and CMOS logic families.

UNIT II- BIPOLAR LOGIC AND INTERFACING:

Bipolar logic - TTL families, CMOS/TTL Interfacing, Low Voltage CMOS logic and Interfacing, Emitter Coupled Logic, Comparison of logic families, Familiarity with standard 74XX and CMOS 40XX series-ICs and its Specifications.

UNIT III - THE VHDL HARDWARE DESCRIPTION LANGUAGE:

Design Flow, Program Structure, Types and Constants, Functions and Procedures, Libraries and Packages.

THE VHDL DESIGN ELEMENTS: Structural Design Elements, Data Flow Design Elements, Behavioral Design Elements, Time Dimension, Simulation and Synthesis.

UNIT IV - COMBINATIONAL LOGIC DESIGN:

Decoders, Encoders, Three State Devices, Multiplexers and Demultiplexers, Code Converters, EX-OR gates and Parity Circuits, Comparators, Adders & Subtractors, ALUs,Barrel Shifter and VHDL models for the above ICs.

UNIT V - SEQUENTIAL LOGIC DESIGN:

Latches and Flip-flops, PLDs, Counters, Shift Registers and their VHDL models,

MEMORIES: ROMs: Internal structure, 2D-decoding commercial types, Timing and Applications. Static RAM: Internal structure, SRAM timing, Standard SRAMS, Synchronous SRAMS.Dynamic RAM: Internal structure, Timing and Synchronous DRAMs.

TEXT BOOKS:

1. John F. Wakerly , Digital Design Principles & Practices, PHI/ Pearson Education Asia, 4th Edition, 2009.
2. J. Bhasker , A VHDL Primer, Pearson Education, 3rd Edition,2009.

REFERENCES:

1. Charles H. Roth Jr., Digital System Design Using VHDL, PWS Publications, 2nd edition, 2008.

2. Stephen Brown and Zvonko Vranesic, Fundamentals of Digital Logic with VHDL Design, McGraw Hill, 2nd Edition, 2008.

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14AEC14 ELECTROMAGNETICS AND TRANSMISSION LINES

Objectives:

1. To understand the behavior of electric and magnetic fields in different media viz. conductors and insulators etc.
2. To know about the nature of wave propagation in different media.
3. To study the behavior of transmission lines and analyze transmission line problems.
4. To understand and analyze wave equations in various conducting and non-conducting media.

Outcomes:

The students will be able to

1. Apply EM field concepts with in the design and construction of electrical equipment.
2. Apply the wave propagation theories in the analysis and design of communication systems.
3. Design and construct Transmission Lines.
4. Understand the importance of various stub matching techniques.

Review of Coordinate Systems, Vector Calculus:

UNIT I

ELECTROSTATICS:

Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Equations for Electrostatic Fields, Energy Density.

Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors.

UNIT II

MAGNETOSTATICS :

Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy.

UNIT III

MAXWELL'S EQUATIONS (TIME VARYING FIELDS):

Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Differential and Integral Forms and Word Statements. Conditions at a Boundary Surface: Dielectric-Dielectric and Dielectric-Conductor Interfaces.

UNIT IV

EM WAVE CHARACTERISTICS:

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

Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem – Applications, Power Loss in a Plane Conductor.

UNIT V

TRANSMISSION LINES:

Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Lossless / Low Loss Characterization, Distortion – Condition for Distortion less and Minimum Attenuation, Loading - Types of Loading.
Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR, UHF Lines as Circuit Elements; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines – Impedance Transformations, Significance of Z_{min} and Z_{max} , Smith Chart – Configuration and Applications, Single and Double Stub Matching.

TEXT BOOKS:

1. Matthew N.O. Sadiku, Elements of Electromagnetics, Oxford University Press, 4th edition, 2009.
2. William H. Hayt Jr. and John A. Buck, Engineering Electromagnetics, TMH, 8th edition, 2009.

REFERENCES:

1. Joseph Edminister, Schaum's outline of Electromagnetics- McGraw Hill, 2nd Edition.
2. F.T.Ulaby, Fundamentals of Applied Electromagnetics, Prentice Hall, 6th Edition.

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14AHS15 QUANTITATIVE APTITUDE AND REASONING – I
(Audit Course)

Objectives:

The main objectives of this course are

1. To learn the concepts of coding and decoding of letters and numbers.
2. To interpretation data using the graphs.
3. To understand the basic concepts of probability.
4. To Comprehend the relation between time and distance in real life problems.

Outcomes:

After completion of the course the student will be able to

1. Strengthen their ability to meet the challenges in solving Time and distance problems.
2. Apply Data interpretation to solve the problems on Line, Bar, Pie graphs.
3. Develop the thinking ability and apply Venn diagram and binary logic.
4. Apply the number series and letter analogies in problems on verbal analogy.

Syllabus for Quantitative Aptitude

Competency 1:

1.1 Numbers

Classification of numbers - Divisibility rules - Finding the units digit - Finding remainders in divisions involving higher powers -LCM and HCF Models.

1.2 Decimal Fractions

1.3 Simplification

1.4 Square Roots & Cube Roots

1.5 **Average**

Definition of Average - Rules of Average - Problems on Average - Problems on Weighted Average - Finding Average using assumed mean method.

1.6 Problems on Numbers

1.7 Problems on Ages

1.8 Surds & Indices

1.9 **Percentage**

Introduction - Converting a percentage into decimals - Converting a Decimal into a percentage - Percentage equivalent of fractions - Problems on Percentages

1.10 **Profit And Loss & True Discount**

Problems on Profit and Loss percentage - Relation between Cost Price and Selling price - Discount and Marked Price –Two different articles sold at same Cost Price - Two different articles sold at same Selling Price - Gain% / Loss% on Selling.

1.11 **Ratio and proportion**

Definition of Ratio - Properties of Ratios - Comparison of Ratios - Problems on Ratios - Compound Ratio - Problems on Proportion, Mean proportional and Continued Proportion .

Competency 2:

2.1 **Partnership**

Introduction-Relation between capitals, Period of Investments and Shares .

2.2 **Chain Rule**

2.3 **Time & work**

Problems on Unitary method - Relation between Men, Days, Hours and Work - Problems on Man-Day-Hours method – Problems on alternate days - Problems on Pipes and Cisterns .

2.4 **Time & Distance**

Relation between speed, distance and time – Converting kmph into m/s and vice versa - Problems on average speed -Problems on relative speed – Problems on trains -Problems on boats and streams - Problems on circular tracks – Problems on races .

2.5 **Mixtures and Allegations**

Problems on mixtures - Allegation rule - Problems on Allegation

2.6 **Simple Interest**

Definitions - Problems on interest and amount – Problems when rate of interest and time period are numerically equal.

2.7 **Compound Interest**

Definition and formula for amount in compound interest - Difference between simple interest and compound interest for 2 years on the same principle and time period.

2.8 **Logarithms**

Syllabus For Reasoning

Competency 3:

3.1 Cubes

Basics of a cube - Formulae for finding volume and surface area of a cube - Finding the minimum number of cuts when the number of identical pieces are given - Finding the maximum number of pieces when cuts are given - Problems on painted cubes of same and different colors - Problems on cuboids - Problems on painted cuboids - Problems on diagonal cuts

3.2 Venn diagrams

Representing the given data in the form of a Venn diagram – Problems on Venn diagrams with two sets - Problems on Venn diagrams with three sets –Problems on Venn diagrams with four sets

3.3 Binary Logic

Definition of a truth-teller - Definition of a liar - Definition of an alternator –

Solving problems using method of assumptions - Solving analytical puzzles using binary logic .

Competency 4:

4.1 Number and letter series

Difference series - Product series - Squares series - Cubes series - Alternate series - Combination series - Miscellaneous series - Place values of letters.

4.2 **Number and Letter Analogies**

Definition of Analogy -Problems on number analogy -Problems on letter analogy - Problems on verbal analogy .

Odd man out

Problems on number Odd man out -Problems on letter Odd man out –

Problems on verbal Odd man out .

Competency 5:

5.1 Coding and decoding

Coding using same set of letters - Coding using different set of letters –

Coding into a number - Problems on R-model .

5.2 Direction sense

Solving problems by drawing the paths-Finding the net distance travelled – Finding the direction - Problems on clocks - Problems on shadows - Problems on damaged compass - Problems on direction sense using symbols and notations

5.3 Critical Reasoning

Problems on assumption - Problems on conclusions –Problems on inferences – Problems on strengthening and weakening of arguments - Problems on principle -Problems on paradox

5.4 Lateral reasoning puzzle

Problems on common balance -Problems on digital balance - Problems on coins -Problems on lockers -Problems on heights -Digit puzzles using basic arithmetic operations .

Text Books:

1. GL Barrons,Tata Mc Graw Hills, 'Thorpe's Verbal reasoning', LSAT Materials.2015.
2. R S Agarwal, 'A Modern approach to Logical reasoning' , S chand Company Ltd 2002.

Reference Books:

1. Abhjit Guha 'Quantitative Aptitude' Tata Mc Graw Hills, 4th Edition, 2011.
2. R S Agarwal, 'Quantitative Aptitude' S. Chand Company Ltd 2008.
3. G.L BARRONS 'Quantitative Aptitude'. Tata Mc Graw Hills,2014

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14AEC16 PULSE & DIGITAL CIRCUITS LAB

Objectives:

To familiarize student with

1. *Generation and processing of sinusoidal and non-sinusoidal signals.*
2. *Fundamentals of basic logic gates and its applications.*
3. *Analysis and design of various multivibrator circuits.*
4. *Design and analysis of UJT relaxation oscillator and boot-strap sweep circuits*

Outcomes:

After the completion of the lab, the student

1. *Will be able to Generate and process sinusoidal and non-sinusoidal signals.*
2. *Will be able to understand fundamentals of basic logic gates and design applications using basic gates.*
3. *Will be able to design and analyze various multivibrator circuits.*
4. *Will be able to design and analyze UJT relaxation oscillator and boot-strap sweep circuits*

Minimum Twelve experiments to be conducted:

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clamper's.
4. Transistor as a switch.
5. Study of Logic Gates & Some applications.
6. Half adder & Full adder.
7. Sampling Gates.
8. Astable Multivibrator.
9. Monostable Multivibrator.
10. Bistable Multivibrator.
11. Schmitt Trigger.
12. UJT Relaxation Oscillator.
13. Bootstrap sweep circuit.
14. Constant Current Sweep Generator using BJT.

Equipment required for Laboratories:

1. RPS :(0 – 30)V
2. CRO :(0 – 20)MHz.
3. Function Generators:(0 – 3)MHz
4. Components
5. Multi Meters

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II B.Tech –II Semester ECE

L	T	P	C
-	-	3	2

14AEE17 ELECTRICAL TECHNOLOGY LAB

Objectives:

1. To understand the nature of different types of network theorems and two-port networks.
2. To understand the magnetic characteristics and Speed control of DC machines and obtain experimentally.
3. To understand about phasor concepts of Locus diagrams and Resonance in R-L-C circuits.
4. To test the different types of DC machines and determine their efficiency from test results

Outcomes:

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

1. Understand the application of Network Theorems and analysis of electrical circuits.
2. Know about the phenomenon of resonance in RLC circuits and Two-Port network.
3. Acquire knowledge about performance characteristics of Transformer, Induction Motor and Alternator.
4. Understand the methods of speed control and testing of DC Machines.

PART-A:

The following experiments are required to be conducted as compulsory experiments:

1. Verification of Superposition and Reciprocity theorems.
2. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.
3. Experimental determination of Thevenin's and Norton's equivalent circuits
4. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance.
5. Swinburne's Test on DC shunt machine and Predetermination of efficiency as motor and generator.
6. Brake test on DC shunt motor. Determination of performance characteristics.
7. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).

PART-B:

Any three of the following experiments are required to be conducted:

8. Series & Parallel Resonance in RLC Network. Determination of Timing and Resonant frequency, Bandwidth and Q Factor of circuit
9. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.
10. Two port network parameters – z-y and ABCD Parameters and analytical verification.
11. Brake test on 3-phase Induction motor (performance characteristics).
12. Regulation of alternator by synchronous impedance method.
13. Speed control of DC motor by Armature Voltage Control and Field Control Method.

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14AEC17 DIGITAL COMMUNICATIONS

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III B.Tech-I Semester ECE	3	1	-	3

Objectives:

The course will provide the student:

1. To learn the digitization techniques for analog messages and digital multiplexing.
2. To know the basic principles of baseband digital transmission.
3. To study the concepts of information theory.
4. To learn various error detection and correction codes.
5. To know the basic principles of bandpass digital transmission.

UNIT I

DIGITIZATION TECHNIQUES FOR ANALOG MESSAGES:

Introduction - Importance of Digitization Techniques for Analog Messages, Pulse Code Modulation (PCM) - Generation and Reconstruction, Quantization Noise, Non-Uniform Quantization and Companding, PCM with Noise-Decoding Noise, PCM versus Analog Modulation.Delta Modulation, Adaptive Delta Modulation, Differential PCM Systems (DPCM), Digital Multiplexing-Multiplexers and Hierarchies.

UNIT II

BASE BAND DIGITAL TRANSMISSION:

Digital Signals and Systems – Digital PAM Signals, Transmission Limitations, Noise and Errors – Binary Error Probabilities, Matched Filtering, Correlation Detection.

Band Limited Digital PAM Systems – Nyquist Pulse Shaping, Optimum Terminal Filters, Correlative Coding- Duo binary signaling, Modified Duo Binary Signaling Schemes.

UNIT III

INFORMATION THEORY:

Information Measure and Encoding - Information Measure, Entropy and Information Rate, Coding for a Discrete Memory Less Channel, Information Transmission on a Discrete Channels – Mutual Information, Binary Symmetric Channel, Discrete Channel Capacity.

UNIT IV

CHANNEL CODING:

Error Detection & Correction - Repetition & Parity Check Codes, Interleaving, Code Vectors and Hamming Distance, Forward Error Correction (FEC) Systems, Automatic Retransmission Query (ARQ) Systems, Linear Block Codes – Matrix Representation of Block Codes, Convolutional Codes – Convolutional Encoding, Decoding Methods.

UNIT V

BAND PASS DIGITAL TRANSMISSION:

Digital CW Modulation – Spectral Analysis of Digital Band Pass Signals, Signal Space, Gram-Schmidt Procedure, Coherent Binary Systems – Optimum Binary Detection, Coherent ASK (on-off keying), BPSK and FSK, Timing and Synchronization, Interference, Non-Coherent Binary Systems, Non-Coherent FSK, Differentially Coherent PSK.

Quadrature Carrier and M–ary Systems- Quadrature Carrier Systems, M–ary PSK Systems, M–ary QAM Systems, M–ary FSK Systems and Comparison of Digital Modulation Systems.

TEXT BOOKS:

1. A. Bruce Carlson, & Paul B. Crilly, Communication Systems – An Introduction to Signals & Noise in Electrical Communication, McGraw-Hill International Edition, 5th Edition, 2011.
2. Simon Haykin, Communication Systems, Wiley-India edition, 3rd edition, 2010.

REFERENCE BOOKS:

1. Sam Shanmugam, Digital and Analog Communication Systems, John Wiley, 2005.
2. B.P. Lathi, &Zhi Ding, Modern Digital & Analog Communication Systems, Oxford University Press, International 4th edition, 2010.
3. Herbert Taub& Donald L Schilling, Principles of Communication Systems, Tata McGraw-Hill, 3rd Edition, 2009.

Outcomes:

At the end of the course, students should be able to:

1. Understand the difference between various digitization techniques for analog messages and digital multiplexing.
2. Analyze the basics of baseband digital transmission.
3. Understand the concepts of information theory.
4. Analyze error detection and correction codes.
5. Analyze the basics of bandpass digital transmission.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√		√								√	
CO-2	√	√			√		√					√
CO-3	√			√						√		
CO-4					√		√					√
CO-5		√	√						√		√	√

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC18 VLSI DESIGN

	L	T	P	C
III B.Tech-I Semester ECE	3	1	-	3

Objectives:

The course will provide the student:

1. To introduce basic NMOS, CMOS & Bi-CMOS circuits.
2. To study different MOS logic circuits.
3. To understand CPLDs and FPGAs.
4. To understand the design of various subsystems
5. To understand the different testing techniques.

UNIT I

INTRODUCTION: Introduction to IC technology, MOS and related technology, basic MOS transistors, Fabrication of NMOS, CMOS (P-well, N-well and Twin-tub process) and Bi-CMOS process, IC process – Oxidation, Lithography, Diffusion, Ion implantation, Metallization and Encapsulation.

BASIC ELECTRICAL PROPERTIES OF MOS AND BICMOS CIRCUITS: I_{ds}–V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, figure of merit ω_0; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT II

BASIC CIRCUIT CONCEPTS: Sheet Resistance Rs and its concepts to MOS, Area Capacitance calculations, Inverter Delays, Driving large Capacitive Loads, Propagation delay, Wiring Capacitances and Choice of layers.

GATE LEVEL DESIGN: Logic gates and other complex gates, Switch logic, Alternate gate circuits.

UNIT III

VLSI CIRCUIT DESIGN PROCESSES: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2μm CMOS Design rules for wires, Contacts and Transistors, Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

VLSI DESIGN STYLES: Full-custom, Standard Cells, Gate-arrays, FPGAs and CPLDs.

UNIT IV

SUBSYSTEM DESIGN: Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Counters, High Density Memory Elements.

UNIT V

VHDL SYNTHESIS: VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Simulation, Layout, Design capture tools, Design Verification Tools.

CMOS TESTING: Need for testing, test principles, design strategies for test, chip level test techniques, system-level test techniques, layout design for improved testability

TEXT BOOKS:

1. Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, "Essentials of VLSI circuits and systems", PHI, 2013 Edition.
2 Weste and Eshraghian, "Principles of CMOS VLSI Design", Pearson Education, 2012.

REFERENCE BOOKS:

1. Wayne Wolf, "Modern VLSI Design", Pearson Education, 3rd Edition, 2004.
2. John P. Uyemura, "Introduction to VLSI Circuits and Systems", John Wiley, 2003.

Outcomes:

After completion of the course, the student will

1. Gain knowledge of different VLSI fabrication processes and CMOS Logic Design.
2. Be able to Design different MOS logical circuits.
3. Be able to Design for Programmable architectures such as, PLDs, CPLDs and FPGAs.
4. Be able to design various subsystems.
5. Be able to know about need for testing and different testing techniques.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1		√										
CO-2			√				√					√
CO-3					√							
CO-4		√										
CO-5					√	√						

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14AEC19 ANTENNA AND WAVE PROPAGATION

	L	T	P	C
III B.Tech-I Semester ECE	3	1	-	3

Objectives:

The course will provide the student:

1. To introduce the fundamental principles of antenna theory.
2. To expose the students to various types of wire antennas, antenna arrays and their radiation pattern.
3. To apply the principles of antennas to the analysis, design of loop, Yagi - uda antennas and to measure various Antenna parameters.
4. To introduce basic and practical configurations of Horn, Microstrip, reflector and lens antennas and their applications.
5. To study about radio wave propagation.

UNIT I

ANTENNA BASICS:

Introduction, Basic antenna parameters- patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity, Gain, Resolution, Antenna Apertures, Effective height, Illustrative problems. Antenna field zones, Antenna temperature, front–to-back ratio, antenna theorems, retarded potential-Helmholtz Theorem..

UNIT II

WIRE ANTENNAS AND ANTENNA ARRAYS:

Thin Linear Wire Antennas: Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions, Field Components, Radiated power and Radiation resistance

ARRAYS OF 2 ISOTROPIC SOURCES: Different cases. Principle of Pattern Multiplication, Uniform Linear Arrays – Broadside Arrays, Endfire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison, BSA with Non-uniform Amplitude Distributions- General considerations and Binomial Arrays.

UNIT III

ANTENNA MEASUREMENTS AND VHF, UHF & MICROWAVE ANTENNAS - I:

Antenna Measurements: Radiation Pattern Measurement Arrangement, Directivity Measurement and Gain Measurements (by Comparison & Absolute Methods).

LOOP ANTENNAS: Introduction, Small Loop, Comparison of far fields of small loop and short dipole, Radiation Resistances and Directivities of small loops, Yagi - Uda Arrays, Folded Dipoles & their characteristics. Helical Antennas-Helical Geometry, Helix modes, Practical Design considerations for Monofilar Helical Antenna in Axial and Normal Modes.

UNIT IV

VHF, UHF AND MICROWAVE ANTENNAS - II:

Horn Antennas- Types, Design Considerations of Horns, Micro strip Antennas- Introduction, features, advantages and limitations, characteristics of Micro strip antennas, reflector antennas- Introduction, Flat sheet and corner reflectors, paraboloidal reflectors- geometry, pattern characteristics, Feed Methods.

Lens Antennas: Introduction, Geometry of Non-metallic Dielectric Lenses, Zoning and Applications.

UNIT V

WAVE PROPAGATION:

Introduction, different modes of wave propagation, Ground wave propagation - Introduction, Plane earth reflections, Space and surface waves, wave tilt, curved earth reflections. Space wave propagation- Introduction, field strength variation with distance and height, effect of earth's curvature, absorption. Super refraction, M-curves and duct propagation, scattering phenomena, tropospheric propagation, fading and path loss calculations.

Sky wave propagation: Introduction, structure of Ionosphere, refraction and reflection of sky waves by Ionosphere, Ray path, Critical frequency, MUF, LUF, OF, Virtual height and Skip distance, Relation between MUF and Skip distance and Multi-HOP propagation.

Text Books:

1. John D. Kraus and Ronald J. Marhefka and Ahmad S.Khan, "Antennas and wave propagation", TMH, New Delhi, 4th Ed., (special Indian Edition), 2010.
2. K.D. Prasad, SatyaPrakashan, "Antennas and Wave Propagation", Tech. India Publications, New Delhi, 2001.

Reference Books:

1. E.C. Jordan and K.G. Balmain, "Electromagnetic Waves and Radiating Systems", PHI, 2nd Edn, 2000.
2. C.A. Balanis, "Antenna Theory- Analysis and Design", John Wiley & Sons, 2nd Edn., 2001.
3. John D. Kraus, "Antennas", McGraw-Hill (International Edition), 2nd Edn., 1988.

Outcomes:

At the end of the course, student should be able to

1. Acquire the knowledge on fundamental principles of antenna and different antenna structures.
2. Design and evaluate the fundamental parameters of antennas and arrays operating at various frequencies from LF to Microwave applications.
3. Analyze different modes of propagation of radio waves and identify their characteristics.
4. Identify the Atmospheric and Terrestrial effects on radio wave propagation.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√											
CO-2												
CO-3												
CO-4												
CO-5												

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14AEC20 MICROPROCESSORS & MICROCONTROLLERS

(Common to ECE & EEE)

	L	T	P	C
III B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To familiarize the architecture of 8086 processor.
2. To become skilled in 8086 assembly language programming.
3. To understand and design microprocessor based systems for various applications.
4. To learn about various programmable peripheral devices and their interfacing.
5. To provide the knowledge of 8051 microcontroller concepts, architecture and programming.

UNIT I

8086 MICROPROCESSOR

Evolution of microprocessors, memory segmentation,8086 Architecture, register organization, Flag Register, Pin Diagram of 8086- Minimum and Maximum mode 8086 systems, Timing Diagrams for Memory Read(MR),Memory Write (MW),IO Read (IOR) and IO Write(IOW) bus cycles.

UNIT II

INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING OF 8086

Addressing Modes-Instruction Set, Assembler Directives-Macros and procedures, assembly language programs for addition ,subtraction, multiplication, division, GCD and LCM of two numbers, Evaluation of arithmetic expressions, largest and smallest numbers in an array, sorting an array, searching for a number in an array, programs using lookup tables.

UNIT III

INTERFACING MEMORY & IO AND APPLICATIONS OF 8086 MICROPROCESSOR

Interfacing memory (static RAM and ROM), programmable input-output port PIO 8255-modes of operation and interfacing with 8086. ADC interfacing, DAC interfacing, waveform generation-Square wave, rectangular wave, ramp wave, triangular wave, staircase wave, traffic light controller, stepper motor control, temperature measurement and control.

UNIT IV

INTERFACING DEVICES

Interrupt structure of 8086,interrupt vector table, programmable interrupt controller 8259 architecture and interface, DMA data transfer-DMA controller 8257, Asynchronous and synchronous serial data transfer schemes- 8251 USART architecture and interfacing, programmable interval timer 8254-architecture and operating modes.

UNIT V

INTRODUCTION TO 8051 MICROCONTROLLER

Architecture, Registers, I/O Ports and Memory Organization, Addressing Modes, Instruction Set, simple assembly language programs using 8051, interrupt structure of 8051-initialization of interrupt, interrupt priorities , timer and counter modes of 8051, serial communication modes of 8051.

TEXT BOOKS:

1. A.K.Ray and K.M.Bhurchandi, "Advanced Microprocessors and Peripherals", 2nd Edition, TMH Publications.

2. Ajay V. Deshmukh, "Microcontrollers, Theory and applications", Tata McGraw-Hill Companies – 2005

REFERENCE BOOKS:

1.DouglasV.Hall, "Microprocessors and Interfacing", 2nd Revised Edition, TMH Publications.

2. Liu & Gibson, "Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design", 2nd ed., PHI.

3. Kenneth j.Ayala, Thomson, "The 8051 Microcontrollers", Asia Pvt.Ltd

Outcomes:

After the completion of the course the students will be able

1. To Study and understand the architecture and programming of any other microprocessor or microcontroller.
2. To write 8086 assembly language programs.
3. To do any type of VLSI and Embedded Systems for Industrial and Real Time applications.
4. To use the microprocessor for serial data transfer.
5. To use the built in devices of 8051 microcontroller in any application.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√		√		√							√
CO-2		√		√								
CO-3	√											
CO-4			√									
CO-5			√									

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14AEC21 ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

	L	T	P	C
III B.Tech-I Semester ECE	3	1	-	3

Objectives:

The course will provide the student to:

1. Study about functioning of different meters associated with measurements of signal characteristics
2. Study and employ CRO for measuring Signal characteristics
3. Study in detail about different bridges employed for Electronic measurements
4. Study the working principles ofdifferentadvanced measuring instruments such as logic analyzers and spectrum analyzers.
5. Study the working of different transducers and its applications.

UNIT I

PERFORMANCE CHARACTERISTICS OF INSTRUMENTS: Performance characteristics, Static characteristics, Errors in Measurement, types of static error, sources of error, dynamic characteristics, statistical analysis. DC ammeters, Multirange ammeters, Universal shunt, Extending of Ammeter ranges, DC voltmeters-multirange, Extending voltmeter ranges, Loading, Transistor voltmeter, AC voltmeters using halfwave and fullwave rectifier, Multirange AC voltmeter, Series type and Shunt type ohmmeter, multimeter for voltage, current and resistance measurements.

UNIT II

OSCILLOSCOPES: Basic principle, CRT features, Block diagram of Oscilloscope, Simple CRO, Vertical amplifier, Horizontal deflecting system, Triggered sweep CRO, Trigger pulse circuit, Delay line in triggered sweep, Typical CRT connections, Travelling wave type CRT, Dual Beam CRO, Dual Trace oscilloscope, Sampling and Storage oscilloscope, Digital readout oscilloscope, derivation of deflection sensitivity, Specifications of Single beam CRO, Measurement of amplitude, frequency and phase (Lissajous method) and principle of Digital storage oscilloscope.

UNIT III

SIGNAL GENERATOR: Fixed and variable AF oscillators, Standard signal generator, Square Pulse, Random noise and sweep generator- principles of working (Block diagram approach).

ANALYZERS: Introduction, Basic Wave analyzers, Frequency selective wave analyzer, Heterodyne wave analyzer, Harmonic distortion analyzers, Spectrum analyzers, and Digital fourier analyzer.

UNIT IV

DC BRIDGES: Wheatstone bridge, Wien Bridge and precautions to be taken when using bridges.

AC BRIDGES: Capacitance comparison bridge, Inductance comparison bridge, Maxwell's, Hay's, Schering and Resonance bridge.

UNIT V

TRANSDUCERS : Introduction, Classification of transducers, Active and passive transducers, Resistive transducer, Strain gauges, LVDT, Pressure Inductive transducer, Capactive, Load cell, Piezoelectrical and Photo Electric transducer, Temperature transducers: RTD, Thermistors and Thermocouple.

TEXT BOOKS:

1. H.S.Kalsi, "Electronic instrumentation", Second edition, Tata McGraw Hill, 2004.
2. A.D. Helfrick and W.D. Cooper, "Modern Electronic Instrumentation and Measurement Techniques", PHI, 5th Edition, 2002.

REFERENCE BOOKS:

1. Ernest O Doebelin and Dhanesh N Manik, "Measurement Systems Application and Design",TMH, 5th Edition, 2009.
2. Robert A.Witte, "Electronic Test Instruments, Analog and Digital Measurements", Pearson Education, 2nd Ed., 2004.
3. David A. Bell, "Electronic Instrumentation & Measurements", PHI, 2nd Edition, 2003.

Outcomes:

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

1. Understand basic principles involved in the meters for measuring voltage, current, resistance and frequency.
2. Employ CRO for measuring voltage, current and frequency.
3. Understand principle of measurements associated with different bridges.

4. Get complete knowledge regarding working of advanced instruments such as logic analyzers and spectrum analyzers.
5. Understand the operation of different transducers and its use in various applications.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√	√			√							
CO-2	√	√		√	√							
CO-3	√	√			√							
CO-4	√	√		√								
CO-5	√	√		√	√							

Sri Venkateswara College of Engineering and Technology(Autonomous), Chittoor.

14AEE20 CONTROL SYSTEMS (Common to EEE & ECE)

	L	T	P	C
III B.Tech-I Semester ECE	3	1	-	3

Objectives:

1. To understand the concept of open loop and closed loop control systems and their applications, mathematical models of electrical and mechanical systems.
2. To acquire the knowledge about time response of first order and second order systems and static errors.
3. To understand the different techniques of stability analysis and their limitations by using different techniques.
4. To acquire the knowledge about frequency response analysis and design of cascade compensators and state space representations.
5. To understand the design of cascade compensators to improve the steady state error and transient responses and the state space representation for linear and non linear systems.

UNIT I

INTRODUCTION: Concepts of Control Systems - Open Loop and closed loop control systems and their differences - Examples of control systems - Classification of control systems - Feed-back Characteristics - Effects of feedback - Mathematical models – Differential equations - Impulse Response and transfer functions - Translational and Rotational mechanical systems - Transfer Function of DC Servo motor - AC Servo motor - Block diagram algebra – Signal flow graph - Reduction using Mason's gain formula.

UNIT II

TIME RESPONSE ANALYSIS: Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control system - Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional - Integral and derivative controls.

UNIT III

STABILITY ANALYSIS: Concept of stability – Routh's stability criterion – Qualitative stability and conditional stability – Limitations of Routh's stability analysis - Root locus concept - Construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.

UNIT IV

FREQUENCY RESPONSE ANALYSIS: Frequency domain specifications - Bode diagrams -Determination of Frequency domain specifications and transfer function from the Bode Diagram - Polar Plot-Phase margin and Gain margin - Stability Analysis from Bode Plots-Nyquist stability criterion.

UNIT V

CLASSICAL CONTROL DESIGN TECHNIQUES: Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency domain - P, PD, PI, PID Controllers.

STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS: Concepts of state - State variables and State Model - Derivation of state models from Block Diagrams – Diagonalization - Solving the Time invariant state Equations - State Transition Matrix and it's properties.

TEXT BOOKS:

1. Norman S. Nise: Control Systems Engineering, 5th edition, Wiley India
2. Kuo.B.C ,FaridGolnaraghi: Automatic Control Systems, 8th edition,2003 John wiley and sons.
3. Nagrath.I.J and Gopal.M: Control Systems Engineering, 5th edition, New AgeInternational (P) Limited Publishers, 2007.

REFERENCE BOOKS:

1. Katsuhiko Ogata: Modern Control Engineering, 5th edition, Prentice Hall of India Pvt. Ltd., 2010
2. AnandKumar.A: Control Systems, Prentice Hall of India Pvt. Ltd.,
3. Joseph DistetanoSchaum's outline of feedback and control systems 2nd edition.

Outcomes:

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

1. Understand the concept of open loop and closed loop systems, applications, transfer functions for linear, time invariant electrical and mechanical systems.
2. Understand the transient response of first and second order systems.
3. Understand the concept of stability, to use the root locus to describe qualitatively the changes in transient response and stability of a system as a parameter is varied.
4. Know the how to use frequency response techniques to adjust the gain to meet a transient response specifications.

5. Design cascade compensators to improve both steady state error and the transient response and to understand the state space representation, for a linear, time – invariant system and conversion between transfer function and state space models.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√			√	√	√					√	√
CO-2	√	√		√	√						√	√
CO-3	√			√	√	√					√	√
CO-4	√				√							√
CO-5	√				√							√

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC23 IC APPLICATIONS & ECAD LAB

	L	T	P	C
III B.Tech-I Semester ECE	-	-	4	2

Objectives:

The course will provide the student to:
1. Verify the various applications of Op-amp.
2. Understand and verify the applications of IC555 and IC566.
3. Use computer-aided design tools for development of complex digital logic circuits.
4. Model, Simulate, Verify and Analyze with hardware description languages.
5. Synthesize various digital circuits using HDL.

Minimum Twelve Experiments to be conducted (Six from each Part A and Part B)

Part A (IC Applications Lab):

1. OP AMP Applications – Adder, Subtractor and Comparator Circuits.
2. Active Filter Applications – LPF, HPF (first order).
3. Function Generator using OP AMPs.
4. IC 555 Timer – Monostable and Astable Operation Circuit.
5. IC 566 – VCO Applications.
6. Voltage Regulator using IC 723.
7. 4 bit DAC using OP AMP.

Part B (ECAD Lab):

Simulate the internal structure of the following Digital IC's using VHDL and verify the operations of the Digital IC's (Hardware).

1. 3-8 Decoder -74138 & 8-3 Encoder- 74X148.
2. 8 x 1 Multiplexer -74X151 and 2x4 Demultiplexer-74X155.
3. 4 bit Comparator-74X85.
4. D Flip-Flop 74X74.
5. JK Flip-Flop 74X109.
6. Decade counter-74X90.
7. Universal shift register -74X194.

Outcomes:

On completion of the course the student will be

1. Able to verify various applications of Op-amp.
2. Able to understand and verify applications of IC555 and IC566.
3. Able to use computer-aided design tools for development of complex digital logic circuits.
4. Able to Model, Simulate, Verify and Analyze with hardware description languages.
5. Able to Synthesize various digital circuits using HDL.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√	√	√	√								
CO-2	√	√	√	√								
CO-3	√	√	√									
CO-4	√	√										
CO-5	√				√							

Sri Venkateswara College of Engineering and Technology(Autonomous), Chittoor.

14AEC24 Analog & Digital Communications Lab

	L	T	P	C
III B.Tech-I Semester ECE	-	-	4	2

Objectives:

To enable the students

1. To understand and compare different analog modulation and demodulation schemes.
2. To understand and compare different pulse modulation and demodulation schemes.
3. To measure radio receiver characteristics.
4. To understand the process of sampling, coding and multiplexing.
5. To understand and compare different digital modulation and demodulation schemes.

Minimum Twelve Experiments to be conducted: (Six from each part A & B)

Part A (Analog Communication Lab):

1. Amplitude modulation and Demodulation.
2. Frequency modulation and Demodulation.
3. Characteristics of Mixer.
4. Pre-emphasis & De-emphasis.
5. Pulse Amplitude Modulation and Demodulation.
6. Pulse Width Modulation and Demodulation.
7. Pulse Position Modulation and Demodulation.
8. Radio Receiver measurements – Sensitivity, Selectivity & Fidelity.

Part B (Digital Communication Lab):

1. Sampling Theorem – Verification.
2. Time division multiplexing.
3. Pulse Code Modulation and Demodulation.
4. Delta modulation and Demodulation.
5. Frequency shift keying - Modulation and Demodulation.
6. Phase shift keying - Modulation and Demodulation.
7. Differential phase shift keying - Modulation and Demodulation.
8. QPSK - Modulation and Demodulation.

Outcomes:

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

1. Analyze different analog modulation and demodulation schemes.
2. Analyze different pulse modulation and demodulation schemes.
3. Measure radio receiver characteristics.
4. Analyze the process of sampling, coding and multiplexing.
5. Analyze different digital modulation and demodulation schemes.

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√	√	√			√				√	√	
CO-2		√	√			√			√	√	√	
CO-3	√	√								√	√	
CO-4	√	√	√	√		√	√		√	√	√	√
CO-5	√	√	√		√	√				√	√	√

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC26 COMPREHENSIVE ONLINE EXAMINATION

	L	T	P	C
III B.Tech-I Semester ECE	-	-	-	1

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AHS16 QUANTITATIVE APTITUDE AND REASONING-II

(Audit Course)(Common to all branches)

	L	T	P	C
III B.Tech-I Semester ECE	3	-	-	-

Objectives:

The main objectives of this course are

5. To evaluate various real life situations by resorting to analysis of key issues and factors.
6. To understand various languages structures.
7. To demonstrate different principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
8. To explore the possibilities of utilization of concepts of reasoning.
9. To interpret the given data graphically.

Outcomes:

After completion of the course the student will be able to

1. Strengthen their ability to meet the challenges in solving real life problems.
2. The student will preserve maturity of the mind in solving linguistic problems.
3. Develop the thinking ability and apply Quadratic equations.
4. Apply the Analytical Reasoning puzzles to solve linear and circular arrangements
5. Analyze the blood relation puzzles in a family tree.

SYLLABUS FOR QUANTITATIVE APTITUDE

COMPETENCY 1:

1. Area

- Formulas for Areas
- Problems on Areas

2. Volumes & Surface Areas

- Problems on Volumes
- Problems on Surface Areas

3. Races & Games of Skill

4. **Calendars**

- Definition of a Leap Year
- Finding the number of Odd days
- Framing the year code for centuries
- Finding the day of any random calendar date

5. **Clocks**

- Finding the angle when the time is given
- Finding the time when the angle is known
- Relation between Angle, Minutes and Hours
- Exceptional cases in clocks

6. **Stocks & Shares**

7. Permutation and Combinations

- Definition of permutation
- Problems on Permutations
- Definition of Combinations
- Problems on Combinations

COMPETENCY 2:

8. Probability

- Definition of Probability
- Problems on coins
- Problems on dice
- Problems on Deck of cards
- Problems on Years

9. True Discount

10. Banker's Discount

11. Heights & Distances

12. Odd man out & Series

- Problems on number Odd man out
- Problems on letter Odd man out
- Problems on verbal Odd man out

13. Data Interpretation

- Problems on tabular form
- Problems on Line Graphs
- Problems on Bar Graphs
- Problems on Pie Charts

SYLLABUS FOR REASONING

COMPETENCY 3:

Deductions

- Finding the conclusions using Venn diagram method
- Finding the conclusions using syllogism method

Connectives

- Definition of a simple statement
- Definition of compound statement
- Finding the Implications for compound statements
- Finding the Negations for compound statements

COMPETENCY 4:

Analytical Reasoning puzzles

- Problems on Linear arrangement
- Problems on Circular arrangement
- Problems on Double line-up
- Problems on Selections
- Problems on Comparisions

COMPETENCY 5:

Blood relations

- Defining the various relations among the members of a family
- Solving Blood Relation puzzles
- Solving the problems on Blood Relations using symbols and notations

TEXT BOOKS:

1. GL Barrons,Tata Mc Graw Hills, *'Thorpe's Verbal reasoning'*, LSAT Materials.

2. R S Agarwal, '*A Modern approach to Logical reasoning'* , S chand Company Ltd 2002.

REFERENCE BOOKS:

1. Abhjit Guha *'Quantitative Aptitude'* Tata Mc Graw Hills, 4th Edition, 2011.

2. R S Agarwal, '*Quantitative Aptitude'* S. Chand Company Ltd 2008.

3. G.L BARRONS '*Quantitative Aptitude'.*Tata Mc Graw Hills.

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14AEC27 MICROWAVE ENGINEERING

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To analyze micro-wave transmission lines such as rectangular waveguides.
2. To Use microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
3. To give students an understanding of basic microwave tube devices (both amplifiers and oscillators).
4. To give basic knowledge on solid state devices such as Gunn diode, Varactor diode etc.
5. To give maximum knowledge on micro wave bench setup for measurement purpose.

UNIT-I :

MICROWAVE TRANSMISSION LINES

Introduction, Microwave spectrum and bands, applications of Microwaves. Rectangular Waveguides-Wave Equation in Rectangular Coordinates, TE/TM mode analysis, Expressions for fields, Characteristic equation and cutoff frequencies, filter characteristics, dominant and degenerate modes, sketches of TE and TM mode fields in the cross-section. Mode characteristics - Phase and Group velocities, wavelengths and impedance relations.

Rectangular Waveguides – Power Transmission and Power Losses, Impossibility of TEM Modes, Types of microwave transmission lines, Micro strip lines-introduction, Z_0 relations, effective dielectric constant, losses, Q-factor.

UNIT-II :

WAVEGUIDE COMPONENTS AND APPLICATIONS

Coupling mechanisms- probe, loop, aperture types. Wave guide discontinuities - waveguide Windows, tuning screws and posts, matched loads. Waveguide attenuators - resistive card, rotary vane Attenuators; waveguide phase shifters-dielectric, rotary vane phase shifters. Wave guide multiport junctions- E plane and H plane Tees, Magic Tee, Directional couplers-2 hole and Bethe hole types.

Ferrites-composition and characteristics, Faraday rotation, Ferrite components-Gyrator, Isolator, Circulator, Scattering Matrix-Significance, Formulation and properties. S Matrix

calculations for 2-port junction, E plane and H plane Tees, Magic Tee, Directional coupler, circulator and Isolator.

UNIT-III :

MICROWAVE TUBES

Limitations and losses of conventional tubes at microwave frequencies, Microwave tubes-O type and M type classifications.

O-type tubes: Two cavity Klystrons-structure, Reentrant cavities, velocity modulation process and Applegate diagram, bunching process and small signal theory-Expressions for output power and efficiency, Reflex Klystrons-structure, Velocity Modulation, Applegate diagram, mathematical theory of bunching, power output, efficiency , oscillating modes and output characteristics, Effect of Repeller Voltage on Power Output.

Slow Wave Structures: Significance, types and characteristics of slow wave structures, structure of TWT and amplification process (qualitative treatment only)

M-Type Tubes: Introduction, cross field effects, Magnetrons-different types, cylindrical travelling wave magnetron-Hull cutoff, modes of resonance and PI-mode operation (qualitative treatment only).

UNIT-IV :

MICROWAVE SOLID STATE DEVICES

Introduction, classification, applications, Transfer Electronic Devices, Gunn diode - principles, RWH theory, characteristics, basic modes of operation - Gunn oscillation modes. LSA Mode, Varactor Diode, Parametric Amplifier. (qualitative treatment only).

UNIT-V :

MICROWAVE MEASUREMENTS

Description of Microwave bench-different blocks and their features, errors and precautions; Microwave power measurement - Bolometers, Measurement of attenuation, frequency, standing wave measurements –measurement of low and high VSWR, cavity-Q, impedance measurements.

TEXT BOOKS:

1. Samuel Y. Liao, Microwave Devices and Circuits, Pearson, 3rd Edition, 2008.
2. M. Kulkarni, Microwave and RADAR Engineering, Umesh Publications, 3rd Edition, 2009.

REFERENCES BOOKS:

1. Herbert J.Reich, J.G.Skalnik, P.F.Ordung and H.L.Krauss, Microwave Principles, CBS publishers and distributors, New Delhi, 2009.
2. R.E.Collin, Foundations for Microwave Engineering, IEEE press, John Wiley, 2nd Edition, 2007.
3. L.Sisodia and G.S.Raghuvanshi, Microwave Circuits and Passive Devices, Wiley Eastern Ltd., New age International publishers Ltd., 2005.
4. A. Das, Microwave Engineering, TMH, 2nd Edition, 2009.

Outcomes:

On completion of the course the student will be able to:

1. Understand the various mode of a rectangular waveguide.
2. Understand the usage microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
3. Understand the various principles involved in various Microwave oscillators and amplifiers such as Klystron tubes, TWT and magnetron.
4. Understand the various principles involved in various Microwave solid state devices.
5. Set up the microwave bench for measurement of various parameters such as microwave frequency, VSWR, Impedance of *unknown load etc.*

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√	√										
CO-2	√	√	√		√							
CO-3	√	√		√	√							
CO-4	√	√		√								
CO-5	√	√	√		√					√		

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14AHS13 TECHNICAL ENGLISH-II

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Preamble:

English is an international language as well as a living and vibrant one. People have found that knowledge of English is a passport for better career and for communication with the entire world. As it is a language of opportunities in this global age, English is bound to expand its domain of use everywhere. The syllabus has been designed to enhance communication skills of the students of Engineering and Technology. The prescribed book serve the purpose of preparing them for everyday communication and to face global competitions in future.

The prescribed text focuses on LSRW skills and vocabulary development. The teachers should encourage the students to use the target language. The classes should be interactive and student-centered. They should be encouraged to participate in the classroom activities keenly.

Objectives:

1. To enable the students to communicate in English for academic and social purpose.
2. To make the students to master LSRW skills to meet the challenges in the society.
3. To strengthen the students to have good command of English Language and thereby to have good command of subject.
4. To develop the skills in students for societal service and the love for work.
5. To make the students to be humane.

UNIT – I

Chapter entitled 'Humour' from "Using English"

Listening - Techniques - Importance of phonetics

L- Meet & Greet and Leave taking, Introducing Oneself and Others (Formal and Informal situations)

R- Reading Strategies -Skimming and Scanning

W- Writing strategies- sentence structures

G-Parts of Speech –Noun-number, pronoun-personal pronoun, verb- analysis

V-Affixes-prefix and suffix, root words, derivatives

UNIT –II

Chapter entitled 'Inspiration' from "Using English"

L- Listening to details

S- Apologizing, Interrupting, Requesting and Making polite conversations

R- Note making strategies

W- Paragraph-types- topic sentences, unity, coherence, length, linking devices

G-Auxiliary verbs and question tags

V- synonyms-antonyms, homonyms, homophones, homographs, words often confused

UNIT –III

Chapter entitled 'Sustainable Development' from "Using English"

L- Listening to themes and note taking

S- Giving instructions and Directions, making suggestions, Accepting ideas, fixing a time and Advising

R- Reading for details -1

W- Resume and cover letter

G- Tenses – Present tense, Past tense and Future tense

V-Word formation and One-Word Substitutes

UNIT –IV

Chapter entitled 'Relationships' from "Using English"

L- Listening to news

S- Narrating stories, Expressing ideas and opinions and telephone skills

R- Reading for specific details and Information

W- Technical Report writing-strategies, formats-types-technical report writing

G- Voice and Subject – Verb Agreement

V- Idioms and prepositional Phrases

UNIT –V

Chapter entitled 'Science and Humanism' from "Using English"

L- Listening to speeches

S- Making Presentations and Group Discussions

R- Reading for Information

W- E-mail drafting

G- Conditional clauses and conjunctions

V- Collocations and Technical Vocabulary and using words appropriately

Remedial Grammar:

1. Adjectives and Adverbs.
2. Use of Articles.
3. Review of prepositions and conjunctions.
4. Transformation of sentences
    (a) Active and Positive Voice.
    (b) Synthesis and analysis.
    (C) Direct and indirect speech.
5. Common errors in English.

Vocabulary:

1. Synonyms and antonyms.
2. One word substitutions.
3. Phrasal verbs and idioms.
4. Commonly confused words
5. Verbal ability.

Writing practice (composition):

1. Essay writing
2. Report writing
3. Resume writing
4. Creative writing
5. Letter writing

Question Paper pattern: **Max Marks: 70**

PART – I

From the prescribed text book without leaving any lesson

1. 2 marks questions – 5	(Any five out of eight)	5 x 2 = 10M
2. 8 marks questions – 2	(Any two out of four)	2 x 8 = 16M

PART – II

3. General essay – 1	(Any one out of three)	1 x 8 = 8.M

4. Report Writing – 1	(Any one out of two)	1 x 8 = 8.M
5. Resume Writing – 1	(No choice)	1 x 8 = 8.M
6. Idioms – 5	(Any five out of eight)	5 x 1 = 5.M
7. Vocabulary - 5	(Any five out of eight)	5 x 1 = 5.M
8. Correction of sentences - 10	(Any ten out of fifteen)	10 x1 = 10.M

Total = 70Marks

Text Book:

1. **" Using English; A Coursebook for Undergraduate Learners"** published by Orient Black Swan, 2013.

Reference Books:

1. Raymond Murphy's English Grammar with CD, Murphy, Cambridge University Press, 2012.
2. English Conversation Practice –Grant Taylor, Tata McGraw Hill, 2009.
3. Communication SKILLS, Sanjay Kumar & Pushpalatha Oxford Universityy Press, 2012.
4. A Course in Communication Skills- Kiranmai Dutt & co. Foundation Books, 2012.

Outcomes:

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

1. Enrich their communication skills both in academic and social arena.
2. Master LSRW skills.
3. Become proficient in English language and make use of it to be good in his subject.
4. Cultivate skills for societal service and inculcate passion for work.
5. Understand the human values of life and work.

MAPPPING OF COs WITH POs:

COURSE OUTCOMES	**PROGRAMME OUTCOMES**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		✓				✓	✓	✓	✓	✓	✓	✓
CO2		✓				✓	✓	✓	✓	✓	✓	✓
CO3		✓				✓	✓	✓	✓	✓	✓	✓
CO4		✓				✓	✓	✓	✓		✓	✓
CO5		✓				✓	✓	✓	✓		✓	✓

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14ACS07 COMPUTER ORGANIZATION

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The objective of this course is to make students to

1. Understand the structure of Computers.
2. Acquire knowledge in register transfer and micro operations
3. Understand address sequencing and computer arithmetic's.
4. Understand memory system and I/O organization.
5. Understand parallelism and pipeline concepts.

UNIT - I

STRUCTURE OF COMPUTERS: Computer types, functional units, basic operational concepts, Von-Neumann architecture, bus structures, software, performance, multiprocessors and multicomputer, data representation, fixed and floating point and error detecting codes.

UNIT – II

REGISTER TRANSFER AND MICRO-OPERATIONS: Register transfer language, register transfer, arithmetic micro-operations, logic micro-operations, shift micro-operations, arithmetic logic shift unit, computer registers, computer instructions, instruction cycle, instruction formats, addressing modes, data transfer and manipulation instructions.

UNIT - III

MICRO-PROGRAMMED CONTROL: Control memory, address sequencing, micro-program example, and design of control unit.

COMPUTER ARITHMETIC: Addition and subtraction, multiplication and division algorithms, floating-point arithmetic operations.

UNIT - IV

THE MEMORY SYSTEM: Basic concepts, semiconductor RAM, types of read - only memory (ROM), cache memory, virtual memory, secondary storage, RAID,direct memory access.

INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts, Direct Memory Access, Modes of transfer, Peripheral devices.

UNIT – V

PIPELINING: Basic Concepts, Parallel processing, Pipelining, Arithmetic pipelining, Instruction pipelining, RISC pipelining, Data Hazards, Instruction hazards, Vector processing, Array processors, Characteristics of multiprocessors, interconnection structures, inter processor communication and synchronization.

Text Books:

1. M. Moris Mano, Computer System Architecture, 3rd edition, PHI, India,2006.
2. Carl Hamacher, ZvonksVranesic, SafeaZaky, Computer Organization, 5th edition, McGraw Hill, New Delhi, India,2002.

Reference Books:

1. William Stallings, Computer Organization and Architecture- designing for performance, 8th edition, Prentice Hall, New Jersy,2010.
2. Andrew S. Tanenbaum, Structured Computer Organization, 5th edition, Pearson Education Inc, New Jersy,2006.
3. Sivarama P. Dandamudi, Fundamentals of Computer Organization and Design, **Springer** Int. Edition, USA,2003.

Outcomes:

At the end of the course the student will be able to:

1. Evaluate computer architecture and organization.
2. Understand computerinstructions cycle and addressing modes.
3. Understand micro programmed control arithmetic.
4. Understand memory system and accessing I/O devices.
5. Obtain technical knowhow of the advantage of instruction level parallelism and pipelining for high performance processor design.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√	√			√							
CO-2						√		√			√	
CO-3					√		√				√	
CO-4	√			√						√		
CO-5			√						√			

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14AEC28 DIGITAL SIGNAL PROCESSING (Common to ECE & EEE)

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To have an overview of discrete time signals and systems.
2. To familiarize with DFT and FFT computations.
3. To design various types of IIR and FIR filters.
4. To realize digital filters using different structures.
5. To know about multirate signal processing

UNIT-I

DISCRETE TIME SIGNALS AND SYSTEMS: Discrete time signals -sequences, Elementary discrete time signals, Basic operations on sequences, classification of discrete time signals, classification of discrete time systems-static and dynamic, causal and non causal, linear and nonlinear, shift invariant and shift variant, stable and unstable, FIR and IIR systems. Impulse response and linear convolution, condition for BIBO stability, Difference equation of a discrete time LTI system. System function H(Z). Stability analysis using system function. Response of a digital system using Z- transforms- Natural response, Forced response and total response. Frequency spectrum of discrete time systems.

UNIT-II

DISCRETE FOURIER TRANSFORM AND FAST FOURIER TRANSFORM: Discrete Fourier Transforms (DFT)- DFT and IDFT, Properties of DFT, Direct Computation of DFT and IDFT, circular convolution, Linear convolution using circular convolution, overlap-add and overlap – save methods for long sequences.

Fast Fourier transforms (FFT) - Radix2 decimation in time and decimation in frequency FFT algorithms, computation of IDFT through FFT.

UNIT-III

REALIZATION OF DIGITAL FILTERS: IIR Filter structures: Direct form-I realization, Direct form-II realization, Transposed forms, Cascade form structure, Parallel form structure, Lattice structure for first and second order IIR systems, Ladder structure.

FIR Filter structures: Direct form, Transposed form and Cascade form structures, Minimum multiplier structure for linear phase FIR filters, Lattice structure for first order and second order FIR systems.

UNIT-IV

DESIGN OF IIR FILTERS: Analog filter approximations - Butterworth and Chebyshev, Analog to analog transformation to transform low pass to high pass, bandpass and bandstop filters, Design of IIR filters from analog filters: Backward difference method, Impulse invariant technique and Bilinear transformation, Illustrative Problems.

UNIT-V

DESIGN OF FIR FILTERS & INTRODUCTION TO MULTIRATE SIGNAL PROCESSING: Design of FIR digital Filters - Fourier series method, Windowing method - Rectangular window, Bartlett window, Hamming window, Hanning window, Blackman window, Illustrative Problems.

Introduction to Multirate Digital Signal Processing: Decimation and Interpolation, Sampling rate conversion by a rational factor.

TEXT BOOKS:

1. Sanjit K. Mitra, Digital Signal Processing, A computer base approach, Tata McGraw Hill, 3rd edition, 2009.
2. A.Anand Kumar, Digital Signal Processing, PHI Learning Private Limited, 2013.

REFERENCE BOOKS:

1. A.V. Oppenheim and R.W. Schaffer, Discrete Time Signal Processing, Pearson Education, 2012.
2. Andreas Antoniou, Digital Signal Processing, TATA McGraw Hill, 2006.
3. M. H. Hayes, Digital Signal Processing, Schaum's Outlines, TATA Mc-Graw Hill, 2007.

Outcomes:

On completion of the course the student will be able to:

1. Analyze and process signals in the discrete time domain.
2. Design digital filters to suit specific requirements for specified applications.
3. Find frequency spectrum of discrete time systems.
4. Check the stability of a digital filter.
5. Outline the concepts of decimation and interpolation.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	**PROGRAM OUTCOMES**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√											
CO-2			√									
CO-3							√					
CO-4	√											
CO-5									√			

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC29 OPTICAL COMMUNICATIONS

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To learn the basic concepts of ray & mode theory and optical fiber fabrication.
2. To introduce various signal degradation factors in optical fibers and their interconnections.
3. To make the students learn about the optical sources with various components or processes for applications.
4. To enlighten the student with optical signal detection process and signal impediments.
5. To understand optical amplification, wavelength conversion and regeneration techniques.

UNIT-I

INTRODUCTION: Historical development, Optical fiber communication system, Advantages of optical fiber communication, Ray theory transmission, Electromagnetic mode theory for optical propagation, Cylindrical fiber, Single-mode fibers,Fiber Materials -Fiber Fabrication, MechanicalProperties of Fibers, Fiber Optic Cables.

UNIT-II

TRANSMISSION CHARACTERISTICS OF OPTICAL FIBERS: Attenuation, Material absorption losses in silica glass fibers, Linear scattering losses, Nonlinear scattering losses, Fiber bend loss, Mid-infrared and far-infrared transmission, Dispersion, Chromatic dispersion, Intermodal dispersion, Overall fiber dispersion, Polarization, Optical fiber connections - joints, couplers and isolators, Fiber alignment and joint loss, Fiber splices, Fiber connectors, Expanded beam connectors, Fiber couplers, Optical isolators and circulators.

UNIT-III

OPTICAL SOURCES: Introduction, The light emitting diode - LED power and efficiency, LED structures, LED characteristics, The laser – Introduction,Basic concepts, Optical emission from semiconductors, The semiconductor injection laser, Injection laser structures, Single-frequency injection lasers.

UNIT-IV

OPTICAL DETECTORS: Introduction, Device types, Optical detection principles, Absorption, Quantum efficiency, Responsivity, Long-wavelength cutoff, Semiconductor photodiodes without internal gain, Semiconductor photodiodes with internal gain,Mid-infrared and far-infrared photodiodes, Phototransistors, Metal–semiconductor–metal photo-detector, Direct detection receiver performance considerations – Introduction, Noise, Receiver noise.

UNIT-V

OPTICAL AMPLIFICATION, WAVELENGTH CONVERSION AND REGENERATION: Introduction, Optical amplifiers, Semiconductor optical amplifiers, Fiber and waveguide amplifiers, Wavelength conversion, Optical regeneration.

INTEGRATED OPTICS AND PHOTONICS - Integrated optics and photonics technologies, Planar waveguides, Integrated optical devices.

TEXT BOOKS:

1. John M. Senior, "Optical Communication, Principles and Practice", Prentice Hall of India, 3rd edition 2009.
2. Gerd Keiser, "Optical Fiber Communication", McGraw– Hill International, Singapore, 3rdedition 2000.

REFERENCE BOOKS:

1. Max Ming-Kang Liu, "Principles and Applications of Optical Communications", TMH, 2010.
2. S.C.Gupta, "Text book on optical fiber communication and its applications", PHI,2005.
3. Satish Kumar, "Fundamentals of Optical Fiber communications", PHI, 2009.

Outcomes:

On completion of the course the student will be able to:

1. Understand optical signal propagation in optical fiber.
2. To enumerate attenuation, scattering, dispersion and polarization in OFC system.
3. To use appropriate optical sources LEDs, LASER as the communication system warrants.
4. Enable to decide correct detectors for optical receiver design.
5. Decide the type of optical amplifiers and wavelength converters required for acceptable BER.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√		√									
CO-2	√	√		√								
CO-3	√	√							√		√	
CO-4	√	√		√	√		√	√				√
CO-5	√	√	√	√		√				√		√

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14AME58 TOTAL QUALITY MANAGEMENT

(Choice based Credit Course) (Inter Department)

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Objectives:

To make the students learn:

1. The developments in tools of quality and their impact on production.
2. Comprehending the ISO 9000 and ISO 14000 series of quality standards.
3. Recognize the use of non statistical and statistical tools in real life situations.
4. The application of value improvement elements and six sigma.
5. The reliability concepts associated with the quality management system

UNIT I

TQM: Overview, concepts, elements, History-Quality management philosophies-Juran, Deming, Crosby , Feigenbaum, Ishikawa, Stages of Evolution, continuous improvement, objectives, internal and external customers.

QUALITY STANDARDS: Need of standardization, Institutions, bodies of standardization, ISO 9000 series – ISO 14000 series, other contemporary standards, ISO certification process, Third party audit.

UNIT II

PROCESS MANAGEMENT: Quality Measurement Systems (QMS),developing and implementing QMS, non-conformance database, TQM tools & techniques- 7 QC tools, 7 New QC tools.

PROBLEM SOLVING TECHNIQUES: Problem Solving process, corrective action, order of precedence, System failure analysis approach, flow chart, fault tree analysis, failure mode assessment and assignment matrix, organizing failure mode analysis.

UNIT III

QUALITY CIRCLES: Organization, focus team approach, statistical process control, process chart, Ishikawa diagram, preparing and using control charts.

QUALITY FUNCTION DEPLOYMENT (QFD): Elements of QFD, benchmarking-Types, Advantages & limitations of benchmarking, Taguchi Analysis, loss function, Taguchi design of experiments. Poka-yoke, Kaizen, Deming cycle.

UNIT IV

VALUE IMPROVEMENT ELEMENTS: Value improvement assault, supplier teaming. Business process reengineering & elements of supply chain management.

SIX SIGMA APPROACH: Application of six sigma approach to various industrial situations.

UNIT V

INTELLECTUAL PROPERTY RIGHTS AND PATENTS: Introduction, Basic laws, Types, Registration agencies, Copy Rights - Introduction, Principles, Rights afforded by Copyright law, ownership, Patent – Introduction, Rights, requirements. Application process.

FUNDAMENTAL CONCEPTS OF RELIABILITY: Reliability definitions, failure, failure density, failure Rate, hazard rate, Mean Time To Failure (MTTF), Mean Time Between Failure (MTBF), maintainability, availability, pdf, cdf, safety and reliability, quality, cost and system effectiveness, life characteristic phases, modes of failure, areas of reliability, quality and reliability assurance rules, product liability, importance of reliability.

TEXT BOOKS:

1. Dale H. Besterfield, C. Bestefield Michno & et.al., Total Quality Management, New Jercy, 3rd Edition, Pearson Edition, 2010.
2. Senthil Arasu & J. Praveen Paul, Total Quality Management, Chennai, 4th Edition, SciTech Publishers, 2007.

REFERENCES:

1. Hand Book, John Hradesky, Total Quality Management, 1st Edition, Tata McGraw Hill Professional, 1994.
2. A Road map to quality, WWW.unido.org. Australia, 2012.
3. Prabhuddha Ganculi., Intelluctual Property Rights, TataMc-Graw-Hill, New Delhi.

Outcomes:

After completion of the course the student will be able to

1. Summarize TQM concepts with quality standards, tools, value addition and reliability concept.

2. Select the best solution for problem solving in QC tools, QFD model and abtain patents for innovative idea and models.
3. Solve industry problems with available sources, software tools, modern TQM techniques with system approach.
4. Judge the solutions to sustain customer trust-worth-ship besides industry growth.
5. Organize a team and play a key role in decision making with interpretation skills besides continuous learning.

MAPPING:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	2											
CO2	1	2										2
CO3		2	2		2	2	3			2	2	2
CO4		3	2		2	3		2			2	
CO5				2				2	3	2		3

Competency addresses outcome: - 1 = slightly; 2 = moderately; 3 = substantially

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14ACS35 CLOUD COMPUTING

(Choice based Credit Course) (Inter Department)

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The Objective of this course is to make students to

1. To analyze the components of cloud computing and its business perspective..
2. Understand the various services of cloud and to identify various relations in cloud based information systems
3. To collaborate with real time cloud services...
4. Understand various cloud virtualization applications.

UNIT I

OVERVIEW OF CLOUD COMPUTING: Meaning of the terms cloud and cloud computing, cloud based service offerings, Grid computing vs Cloud computing, Benefits of cloud model, limitations, legal issues, Key characteristics of cloud computing, Challenges for the cloud, The evolution of cloud computing.

UNIT II

WEB SERVICES DELIVERED FROM THE CLOUD: Infrastructure as a service, Platform-as-a-service, Software-as-a-service. Building Cloud networks: Evolution from the MSP model to cloud computing and software -as-a-service, The cloud data center, SOA as step toward cloud computing, Basic approach to a data center based SOA.

UNIT-III

CLOUD SERVICES: Collaborating on calendars, Schedules, and Task Management, Exploring online scheduling applications, Exploring online planning and task management. Collaborating on Word Processing, Storing and sharing files and Other Online Content. Exploring Online Photo-Editing Applications.

UNIT IV

INTRODUCTION TO VIRTUALIZATION History of virtualization, objectives of virtualization, benefits of virtualized technology, VIRTUALIZATION TECHNOLOGIES

VMware, Microsoft Hyper-V, Virtual Iron, Xen, Ubuntu (Server Edition), Software Virtualization, Para Virtualization, OS Virtualization, Oracle Virtualization, Storage Virtualization Technologies, Virtualization and Storage Management.

UNIT V

SECURITY IN THE CLOUD: Cloud security challenges, Software-as-a-service security. Common Standards in Cloud computing: The open cloud consortium, The distributed management task force, standards for application developers, standards for messaging, standards for security.

Outcomes:

At the end of course student should be able to

1. Use practical cloud applications in daily life.
2.Apply various cloud services in real time applications.
3. Collaborate with different practical web applications for business management.
4. Differentiate cloud security services and standards.

TEXT BOOKS:

1."*Cloud Computing implementation, management and security*", John W. Rittinghouse, James F. Ransome ,CRC Press, Taylor &Francis group, 2010.

2. "Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book" ,Ivanka Menken and Gerard Blokdi j k, , EmereoPvt Ltd, April 2009.

3. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008.

REFERENCES:

1. Cloud Application Architectures Building Applications and Infrastructure in the Cloud, George Reese, and O'Reilly Media Released, April 2009.

2. Cloud Computing and SOA convergence in your enterprise", David S. Linthicum, Addison- Wesley,2009.

3. "Cloud Computing: A practical approach", Anthony T.velte, TobJ.velte Robert Elsenpeter ,Tata Mc Graw Hill , 2010.

Mapping Course Outcomes with Program outcomes

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓	✓			✓			✓			✓	✓
CO2									✓	✓		
CO3			✓	✓			✓					
CO4					✓	✓				✓		

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEE37 SOFT COMPUTING TECHNIQUES

(Choice based Credit Course) (Inter Department)

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**1**	**-**	**3**

Objectives:

1. To understand the basic concepts of neural networks, Artificial Neural networks, Fuzzy Logic and Genetic Algorithm
2. To know the essentials of Artificial Neural networks with single and Multi-Layer feed forward networks.
3. To acquire knowledge about associate memory, fuzzy sets.
4. To know the concepts of fuzzy logic systems components Genetic Algorithms.
5. To study the applications of soft computing techniques in electrical systems.

UNIT I

ARTIFICIAL NEURAL NETWORKS: Introduction - Biological Neuron - Artificial Neuron - Basic concepts of Neural Networks - Basic Models of ANN Connections - McCulloch-Pitts Model - Characteristics of ANN - Applications of ANN - Artificial Neuron Model - Operations of Artificial Neuron - Types of Neuron Activation Function - ANN Architectures - Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic),

UNIT II

SUPERVISED LEARNING NETWORKS: Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules - Types of Application Perceptron Network - Perceptron Learning Rule – Architecture - Perceptron Training Algorithm - ADALINE, MADALINE - Back Propagation Network - BP Learning Rule, Input Layer Computation, Hidden Layer Computation, Output Layer Computation - Radial Basis Function.

UNIT III

ASSOCIATIVE MEMORY NETWORK: Training Algorithms for Pattern Association - Auto Associative Memory Network - Hetero Associative Memory Network – Bidirectional Associate Memory - Hopfield Networks.

UNIT IV

CLASSICAL & FUZZY SETS: Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

Fuzzy Logic System Components: Fuzzification - Membership value assignment - Development of rule base and decision making system - Defuzzification to crisp sets - Defuzzification methods.

UNIT V

GENETIC ALGORITHMS: Introduction - Basic Operators and Terminologies in GA - Traditional Vs Genetic Algorithm - Encoding, Fitness Function, Reproduction, Crossover, Mutation Operator.

Applications to Electrical Systems: ANN based Short term Load Forecasting - Load flow Studies - Fuzzy logic based Unit Commitment and Genetic Algorithm based Economic Dispatch.

Text Books:

1. Sivanandam.S.N and Deepa.S.N: *Principles of – Soft Computing*, Wiley India.
2. Rajasekharan and Pai: *Neural Networks, Fuzzy logic, Genetic algorithms: synthesisand Applications*, PHI Publications.

References:

1. James A Freeman and Davis Skapura: *Neural Networks*, Pearson Education, 2002.
2. Assad Abu-Jasser: *Solving the unit commitment problem using Fuzzy Logic*, International Journal of Computer and Electrical Engineering, Vol. 3, No.6, December 2011.
3. Pradeepta Kumar Sarangi, Nanhay Singh, R.K.Chauhan and Raghuraj Singh: *Short term load forecasting using Artificial Neural Network: A comparison with Genetic Algorithm Implementation*, ARPN Journal of Engineering and Applied Sciences, Vol. 4, No. 9, November 2009.
4. T.Yalcinoz, H.Altun and M.Uzam: *Economic dispatch solution using a Genetic Algorithm based on Arithmetic crossover*, IEEE Porto Power Tech Conference, 10th – 13th September 2001.

5. Rudresh.B.Magadum, G.Suchitra, Dr.S.H.Jangamshetti: *Fuzzy logic solution for Unit commitment*, International Journal of scientific & Engineering Research, Vol. 3, Issue 4, April 2012.

Outcomes:

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

1. Understand the principles of the control model in electrical systems using Biological and artificial Neural Networks, fuzzy logic systems and genetic algorithms
2. Impart knowledge about single and multilayer feed forward networks.
3. Acquire knowledge about the applications of SCT in electrical systems.
4. Acquire knowledge about classical and fuzzy sets and fuzzy logic system components.
5. Design power systems Electrical Machines , Power Electronics and domestic and Industrial appliances using SCT.

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√	√		√		√	√	√	√	√		√
CO-2	√		√	√	√	√	√				√	
CO-3				√	√		√				√	
CO-4									√	√	√	
CO-5	√			√	√	√	√	√	√		√	√

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AHS14 TECHNICAL ENGLISH LAB- II

(Common to all branches)

	L	T	P	C
III B.Tech-II Semester ECE	-	-	4	2

Objectives:

1. To inculcate the confidence of using correct pronunciation (recollecting the sounds of Monophthongs, diphthongs, consonants and identifying the rules of accent/stress and intonation).
2. To enable the students to improve the proficiency in English (based on the previous learning) at all levels.
3. To train the students to use English effectively in participating group discussions, interviews & in public speaking.
4. To enhance the confidence in problem solving while facing the career.
5. To train the students to face job interviews with confidence.

1. **Listening comprehension:** Listening to passage – Understanding the passage – answering the questions – personal and professional situations.

2. **Resume writing:** Structure – format style – defining career objective – projecting the strengths – preparing covering letter.

3. **Speaking Activities:**

   Just A Minute (JAM) – importance – rules – etiquette – body language.

   Debates – importance – rules - beginning – taking a stand – supporting & defending.

   Describing objects/people/situations: how to describe – physical properties – material-functions – features - complexion - Attire - situation – place – time – theme.

4. **Interview:** Preparing for interview – physically and mentally – answering strategy – face-to-face interview – panel interview - tele interview – video conferencing.

5. **Oral & PowerPoint Presentation:** Importance – developing and organizing the presentations – verbal and visual support - using body language – how to make it effective.

MINIMUM REQUIREMENT FOR ELCS LAB:

1) Computer aided language lab for 70 students, 70 systems – one master console software for self-study.

2) T.V, digital stereo – audio – visual system.

3) Computer laboratory with LAN Connectivity of minimum 70 multimedia systems with the following configuration.

a) Intel Pentium® D 3.00GHZ

b) RAM-1GB minimum

c) Hard disk – 160GB

d) Headphones of durable quality.

Prescribed Software – Globarena

Suggested Software:

6. K-Van Advanced Communication Skills
7. TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
8. DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
9. Lingua TOEFL CBT Insider, by Dreamtech
10. Cambridge Advanced Learners' English Dictionary with CD.
11. Oxford Advanced Learner's Compass, 8th Edition
12. Sanjay Kumar & Pushp Lata. 2011. Communication Skills, OUP

Reference Books:

1 Meenakshi Raman – Technical Communication,2/e, Oxford University Press, New Delhi.
2 Krishna Mohan & Meera Benerji Developing Communication Skills by (Macmillan)
3 English Skills for Technical Students, WBSCTE with British Council, OL
4 TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
5 Robert J Dixson, Everyday Dialogues in English by Prentice – Hall of India Ltd.
6 Koneru, Professional Communication by McGraw Hill.

Outcomes:

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

1. Use English fluently in communication by following LSRW.
2. Develop the art of oral presentation to develop leadership qualities.
3. Assimilate the importance of English in the modern world to compete with the career in the challenging world.
4. Strengthen the required skills to be employable.
5. Face the interviews confidently and improve the chances of getting a job.

MAPPPING OF COs WITH POs:

COURSE OUTCOMES	**PROGRAMME OUTCOMES**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1		✓				✓	✓	✓	✓	✓	✓	✓
CO2		✓					✓	✓	✓	✓	✓	✓
CO3		✓				✓	✓	✓	✓	✓	✓	✓
CO4						✓	✓	✓	✓	✓	✓	✓
CO5									✓	✓	✓	✓

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC32MICROPROCESSORS & MICROCONTROLLERS LAB (Common to ECE & EEE)

	L	T	P	C
III B.Tech-II Semester ECE	-	-	4	2

Objectives:
The course will provide the student:

1. To become skilled in 8086 Assembly Language Programming.
2. To understand different applications of 8086 Microprocessor.
3. To use microprocessor for any type of waveform generation including pattern generation.
4. To learn 8051 Microcontroller Assembly Language Programming.
5. To learn about built – in timer of 8051 Microcontroller.

Note: Minimum Twelve Experiments to be conducted

(Any **Nine** from **Part A** and **Three** from **Part B**)

PART A

8086 Microprocessor Programs using MASM/8086 Kit:

1. ALPs (8086) for addition and subtraction.
2. (a) ALPs (8086) for multiplication and Division.
   (b) ALPs (8086) to determine GCD and LCM of two 16-bit numbers.
3. ALPs(8086) to evaluate arithmetic expressions.
4. ALPs (8086) for sorting and searching.
5. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
6. String operations – Move block, Reverse string, String comparison, Length of string.

Interfacing:

7. ALPs (8086) for square wave and rectangular wave generation using 8255 in I/O mode and BSR mode.
8. ALPs (8086) for ADC and DAC interfacing boards and drawing output Vs input characteristics.

9. ALPs (8086) for generating ramp wave, triangular wave, and stair case wave forms using DAC.
10. ALP (8086) for pattern generation using dual DAC interfacing board.
11. ALP (8086) for traffic light controller.
12. ALP (8086) for stepper motor control.
13. ALP (8086) for temperature measurement.

PART B

Microcontrollers:

1. ALP (8051) to determine the largest and smallest of N bytes.
2. (a) ALP (8051) to multiply a 16-bit number by an 8-bit number.
   (b) ALP (8051) to find square root of an 8-bit number.
3. (a) ALP (8051) to determine LCM of two 8- bit numbers.
   (b)ALP (8051) to determine GCD of two 8- bit numbers.
4. Timer/Counters (8051) in different modes.

Outcomes:

Atthe end of the course student will be

1. Able to write 8086 Assembly Language Programs.
2. Able to use 8086 Microprocessor for any application.
3. Able to generate any type of waveforms.
4. Able to write 8051 Assembly Language Programs.
5. Able to use built – in timer of 8051 Microcontroller.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√	√										
CO-2			√									
CO-3		√										
CO-4	√	√										
CO-5			√									

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC33 COMPREHENSIVE ONLINE EXAMINATION

	L	T	P	C
III B.Tech-II Semester ECE	**-**	**-**	**-**	**1**

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AMB01 MANAGEMENT SCIENCE (Common to ECE,EEE,CSE & IT)

(Audit Course)

	L	T	P	C
III B.Tech-II Semester ECE	**3**	**-**	**-**	**-**

Objectives:

The course will provide the student:

1. To learn the principles of management.
2. To apply concepts in administering technology driven industrial units.
3. To gain an understanding of management functional areas like Production, HR, Marketing etc.
4. To develop knowledge using OR techniques for project management.
5. To analyze the importance of production in the organization.

UNIT I

INTRODUCTION TO MANAGEMENT: Nature, importance and Functions of Management, Approaches to Management - Taylor's Scientific Management - Henry Fayol's Principles of Management, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Leadership Styles – Introduction to Organization –Types of Mechanistic and organic structures.

UNIT II

OPERATIONS MANAGEMENT: Principles and Types of Plant Layout - Methods of production (Job, batch and Mass Production), Work Study - Basic procedure involved in Method Study and Work Measurement-Statistical Quality Control: $\bar{x}$ chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling, TQM Concept - Deming's principles, Six sigma, Bench marking.

UNIT III

MATERIALS MANAGEMENT: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records, MRP, JIT, Marketing: Functions of Marketing, Marketing Mix, Product Life Cycle, Channels of Distribution.

UNIT IV

HUMAN RESOURCES MANAGEMENT (HRM): Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Wage and Salary Administration, Job Evaluation and Merit Rating, Performance Appraisal.

UNIT V

PROJECT MANAGEMENT (PERT/CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (Simple
Problems)

TEXT BOOKS:

1. Aryasri, "Management Science", TMH 4/e, 2009.
2. Stoner, Freeman, Gilbert, Management, 6th Edition, Pearson Education, New Delhi, 2004.
3. PannerSelvem, "Production and Operations Management", 3/e, Prentice Hall of India, 2012

REFERENCES BOOKS:

1. Kotler Philip & Keller Kevin Lane, "Marketing Management", 12/e, PHI, 2005.
2. Koontz &Weihrich, "Essentials of Management", 6/e, TMH, 2005.
3. SubbaRao. P, "Personnel and Human Resource Management", Himalaya Publishing House, 2000

Outcomes:

After completion of this course students will be able to:

1. Apply various areas of functional management for the prospects of businessorganization.
2. Apply management principles for decision making.
3. Handle intricacies of projects efficiently.
4. Use tools and techniques to become an effective manager.
5. Apply production tools and techniques in every area of business.

MAPPING OF COs WITH POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√											
CO-2												
CO-3												
CO-4												
CO-5												

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC34 EMBEDDED SYSTEMS

(Common to ECE, CSE & IT)

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To know the fundamental concepts of embedded systems.
2. To study state machine models and concurrent process models.
3. To study processor peripherals and communication interfaces.
4. To learn the kernel, RTOS.
5. To study the hardware and software design

UNIT-I

INTRODUCTION: Embedded systems overview, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Custom Single purpose processors- RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors. General Purpose Processors - Basic architecture, operation- Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

UNIT-II

STATE MACHINE AND CONCURRENT PROCESS MODELS: Introduction, models Vs. languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT-III

STANDARD SINGLE PURPOSE PROCESSORS: PERIPHERALS: Timers, counters and watch dog timers, real time clock. Communication Interface - Need for communication interfaces, RS232 / UART, RS422/ RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, IEEE 802.11, Blue tooth.

UNIT-IV

EMBEDDED / RTOS CONCEPTS: Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex. Mailboxes, Message Queues, Event Registers, Pipes, Signals, Timers, Memory Management, Priority inversion problem, Embedded operating systems- Embedded Linux, Real-time operating systems- RT Linux, Handheld operating systems- Windows CE.

UNIT -V

DESIGN TECHNOLOGY: Introduction, Automation, synthesis, parallel evolution of compilation & synthesis, logic synthesis, RT synthesis, Behavioral synthesis, system synthesis & Hardware/software Co-design, verification, Hardware/software co-simulation, Reuse of intellectual property codes.

TEXT BOOKS:

1. Frank Vahid, Tony D. Givargis, "Embedded System Design – A Unified Hardware/Software Introduction", John Wiley, 2002.
2. KVKK Prasad, "Embedded / Real Time Systems", Dreamtech Press, 2005.

REFERENCE BOOKS:

1. Jonathan W. Valvano, Brooks / Cole, "Embedded Microcomputer Systems", Thompson
   Learning.
2. David E. Simon, "An Embedded Software Primer", Pearson Ed., 2005.
3. Raj Kamal, "Introduction to Embedded Systems", TMS, 2002.

Outcomes:

On completion of the course the student will

1. Understand the fundamental concepts of Embedded systems.
2. Know the state machine models and concurrent process models.
3. Know the watch dog timer, real time clock and communication interfaces.
4. Understand the RTOS and Kernel.
5. Understand the hardware and software design.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1			√	√								
CO-2			√		√							
CO-3					√		√					
CO-4			√		√							
CO-5					√						√	

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC35 DIGITAL DESIGN THROUGH VERILOG

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To understand the basics of Verilog HDL.
2. To understand Gate level & Switch level of abstraction for modeling digital hardware systems.
3. To understand Behavioral level & dataflow level of abstraction for modeling digital hardware systems.
4. To understand system tasks, functions & UDP's.
5. To design and modeling of digital system using FPGA, CPLD and State Machines.

UNIT I

INTRODUCTION TO VERILOG: Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Functional Verification, System Tasks, Programming Language Interface (PLI), Module, Simulation and Synthesis Tools and Test Benches.

LANGUAGE CONSTRUCTS AND CONVENTIONS: Introduction, Keywords, Identifiers, Whitespace Characters, Comments, Numbers, Strings, Logic Values, Data Types, Scalars and Vectors, Parameters, Memory, Operators and System Tasks.

UNIT II

GATE LEVEL MODELLING: Introduction, AND Gate Primitive, Module Structure, Other Gate Primitives, Tri-state Gates, Array of instances of Primitives, Design of flip-flops with Gate Primitives, Delays, Strengths and Contention Resolution, Net Types and Design of basic circuits.

SWITCH LEVEL MODELLING: Introduction, Basic Transistor Switches, CMOS Switch, Bidirectional gates, Time Delays with Switch Primitives, Instantiations with Strengths and Delays, Strength Contention with Tri-reg nets.

UNIT III

BEHAVIORAL MODELLING: Introduction, Operations and Assignments, Functional Bifurcation, Initial Construct, always Construct, Examples, Assignments with delays, wait

Construct, Multiple always blocks, Designs at Behavioral Level, Blocking and Non-blocking Assignments, case Statement, Simulation Flow, if and if-else Constructs, Assign and De-assign Construct, Repeat Construct, for loop, The Disable Construct, while loop, forever loop, Parallel blocks, force-release Construct and Event.

MODELLING AT DATAFLOW LEVEL: Introduction, Continuous Assignment Structures, Delays and Continuous Assignments, Assignment to Vectors and Operators

UNIT IV

SYSTEM TASKS, FUNCTIONS AND COMPILER DIRECTIVES: Introduction, Parameters, Path Delays, Module Parameters, System Tasks and Functions, File–Based Tasks and Functions, Compiler Directives and Hierarchical Access.

FUNCTIONS, TASKS, AND USER-DEFINED PRIMITIVES: Introduction, Function, Tasks, User- Defined Primitives (UDP), FSM Design (Moore and Mealy Machines).

UNIT V

DIGITAL DESIGN WITH SM CHARTS:

State Machine Charts, Derivation of SM Charts, Realization of SM Charts, Implementation of the Dice Game, Alternative realizations for SM Charts using Microprogramming and Linked State machines.

DESIGNING WITH FPGAS AND CPLDS: Xilinx 3000 Series FPGAs, Designing with FPGAs, Using a One-Hot State Assignment, Altera Complex Programmable Logic Devices (CPLDs), Altera 7000 and Altera FLEX 10K Series CPLDs.

TEXT BOOKS:

1. T.R. Padmanabhan and B. Bala Tripura Sundari, "*Design through Verilog HDL"*, WSE, IEEE Press, 2004.
2. Charles H. Roth Jr., *"Digital System Design Using VHDL,* PWS Publications", 2nd edition, 2008.

REFERENCE BOOKS:

1. Stephen. Brown and Zvonko Vranesic, "*Fundamentals of Logic Design with Verilog"*, TMH, 2005.
2. Michael D. Ciletti, "*Advanced Digital Design with Verilog HDL"*, PHI, 2005.
3. J. Bhasker, "*A Verilog Prime"*, BSP, 2008.

Outcomes:

On completion of the course the student will be able to understand

1. The constructs & conventions of Verilog HDL program.
2. The design, simulation and synthesis of digital system using Gate level & Switch level modeling.
3. The design, simulation and synthesis of digital system using Behavioral level & dataflow level modeling.
4. Usage of system tasks, functions and UDP's in Verilog HDL.
5. The design and modeling of digital system using FPGA, CPLD and State Machines.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1					√							
CO-2		√	√									
CO-3	√	√	√									
CO-4					√							
CO-5			√									

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

14ACS19 COMPUTER NETWORKS	L	T	P	C
IV B. Tech I Semester ECE	3	1	-	3

Objectives:

The objective of the course is to make students to:

1. Understand the basic working of computer networking components.
2. Understand channel allocation problem in medium access control sub layer.
3. Understand design issues of network layer, Routing and Congestion control.
4. Understand the concepts of internet transport protocols (TCP, UDP), DNS, Network security.
5. Understand application layer concepts and issues in network security.

.

UNIT 1

INTRODUCTION: Uses of Computer Networks, Network Hardware, Network Topologies, Network Software, References Models. Examples of Networks: Internet, ARPANET, Third Generation Mobile Phone Networks.

THE DATA LINK LAYER: Data link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, and Sliding Window Protocols.

UNIT II

THE MEDIUM ACCESS CONTROL SUBLAYER: The Channel allocation Problem, Multiple Access Protocols, Ethernet- Ethernet Cabling, The Ethernet MAC Sublayer Protocol. The Binary Exponential Back off Algorithm, Ethernet Performance, Wireless LANs- the 802.11 Protocol Stack, The 802.11 Physical Layer, The 802.11 MAC Sublayer Protocol, The 802.11 Frame Structure, Broad Band Wireless.

UNIT III

THE NETWORK LAYER: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking, the Network Layer in the Internet.

UNIT IV

THE TRANSPORT LAYER: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP.

UNIT V

THE APPLICATION LAYER: DNS-The Domain Name System, Electronic Mail. The World Wide Web.

NETWORK SECURITY: Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms.

Outcomes:

After completing this course the student will be able to:

1 Describe various components and topologies of computer networks
2 Use the network reference model layered structure for real time applications.
3 Implement various routing protocols from different layers.
4 Design, implement and test an efficient algorithmic solution for the give problem.
5 Analyze network security mechanics and other issues in the application layer

TEXT BOOK:

1. *Computer Networks, Fifth Edition, Andrew S. Tanenbaum,David J Wetherall Pearson Education,2011.*

REFERENCE BOOKS:

1. Computer *Communications and NetworkingTechnologies*,Michael A. Gallo, William M. Hancock, Cengage Learning.
2. *Data Communications and Networking, Fifth Edition*,Behrouz A. Forouzan,Tata McGraw Hill.
3. *Computer Networking*: A Top-Down Approach Featuring the Internet, Six Edition,James F.Kurose, K.W.Ross, Pearson Education,2013.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1			✓		✓							
CO-2			✓									
CO-3					✓							
CO-4									✓			
CO-5											✓	

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC36 DIGITAL IMAGE PROCESSING

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To learn the fundamentals of Image Processing.
2. To learn sampling and reconstruction procedures.
3. To learn the various transforms used in image Processing.
4. To learn how image information are modeled analytically.
5. To learn how to analyze and implement image processing algorithms

UNIT I

DIGITAL IMAGE FUNDAMENTALS:

Digital Image representation – Digital image processing System –Visual Perception- Sampling and Quantization - Basic relationships between pixels, and imaging geometry.

UNIT II

IMAGE TRANSFORMS:

Discrete Fourier Transform – Properties of 2 – D Fourier Transform – Fast Fourier Transform, Walsh, Hadamard, Discrete cosine transforms.

UNIT III

IMAGE ENHANCEMENT:

Background enhancement by point processing Histogram processing, Spatial filtering, Enhancement in frequency Domain, Image smoothing, Image sharpening, Colour images

UNIT IV

IMAGE RESTORATION:

Degradation model, Algebraic approach to restoration – Inverse filtering – Least Mean Square filters, Constrained Least square restoration.

UNIT V

IMAGE CODING AND SEGMENTATION:

Fidelity criteria, Encoding process, transform encoding,, detection and discontinuities, Edge linking and Boundary detection, Boundary description.

TEXT BOOKS:

1. R. C .Gonzalez & R.E. Woods, "Digital Image Processing", Addison Wesley/Pearson education, 3rd Edition, 2010.
2. S jayaraman, S Esakkirajan, T Veerakumar, "Digital Image processing",Tata McGraw Hill

REFERENCE BOOKS:

1. Rafael C. Gonzalez, Richard E woods and Steven L.Eddins, "Digital Image processing using MATLAB", Tata McGraw Hill, 2010.
2. William K. Pratt, "Digital Image Processing", John Wilely, 3rd Edition, 2004.

Outcomes:

On completion of the course the student will be able to:

1. Develops ability to identify, formulate & solve problems involving images.
2. Develops ability to design &conduct experiments, analyze &interpret image data.
3. Design a software, Component or process as per needs &specifications.
4. Understand how image are analyzed to extract features of interest.
5. Understand various filters in image processing.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√											
CO-2			√									
CO-3					√							
CO-4						√						
CO-5						√					√	

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC37 WIRELESS COMMUNICATIONS & NETWORKS

Choice based Credit Course I (Department Specific)

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To understand the basic principles of wireless communication.
2. To provide an overview on wireless networking.
3. To provide the basic background in wireless data services, Access protocol, Mobile IP.
4. To provide the basic concept in Wireless LANs Technologies and Bluetooth technologies.
5. To provide the basic knowledge on mobile data networks in related areas.

UNIT-I

MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION: Introduction, FDMA, TDMA, Spread Spectrum, Multiple Access, SDMA, Packet Radio, Packet Radio Protocols, CSMA Protocols, Reservation Protocols

UNIT-II

INTRODUCTION TO WIRELESS NETWORKING: Introduction, Difference between Wireless and Fixed Telephone Networks, Development of Wireless Networks, Traffic Routing in Wireless Networks.

UNIT-III

WIRELESS DATA SERVICES: Common Channel Signaling, ISDN, BISDN and ATM, SS7, SS7 User Part, Signaling Traffic in SS7. Mobile Ip And Wireless Access Protocol - Operation of Mobile IP, Co-Located Address, Registration, Tunneling, WAP Architecture, Overview, WML scripts, WAP Service, WAP Session Protocol, Wireless Transaction, Wireless Datagram Protocol.

UNIT-IV

WIRELESS LAN TECHNOLOGY: Infrared LANs, Spread Spectrum LANs, Narrow Band Microwave LANs, IEEE 802 Protocol Architecture, IEEE 802 Architecture and Services, 802.11 Medium Access Control, 802.11 Physical Layer. Bluetooth - Overview, Radio

Specification, Base Band Specification, Links Manager Specification, Logical Link Control and Adaptation Protocol, Introduction to WLL Technology.

UNIT-V

MOBILE DATA NETWORKS: Introduction, Data oriented CDPD Network, GPRS and Higher Data Rates, Short Messaging Service in GSM, Mobile Application Protocol. Wireless ATM & Hi-Per LAN - Introduction, Wireless ATM, Hi-Per LAN, Ad-hoc Networking and WPAN.

TEXT BOOKS:

1. Wireless Communications and Networks – William Stallings, PHI, 2009.
2. Wireless Communications, Principles, Practice – Theodore, S. Rappaport, PHI, 2nd Edn., 2008.

REFERENCE BOOKS:

1. Principles of Wireless Networks – Kaveh Pah Laven and P. Krishna Murthy, Pearson Education, 2012.
2. Wireless Communications and Networks- Jon W. Mark, Weihua Zhuang, 2006.
3. Wireless Digital Communications – Kamilo Feher, PHI, 1999.
4. Mobile Communications – Jochen Schiller, Pearson Education.

Outcomes:

On Completion of the Course, the student will be able to understand and gain complete knowledge about

1. Basic wireless, cellular concepts.
2. Wireless Networking.
3. Wireless data services, Wireless Application Protocol and Mobile IP.
4. Wireless LANs Technologies and Bluetooth Technologies.
5. GPRS, WATM, Hi-Per LAN

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√					√						
CO-2			√		√							
CO-3			√									
CO-4						√					√	
CO-5			√								√	

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC38 SATELLITE COMMUNICATIONS

Choice based Credit Course I (Department Specific)

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To introduce the basic principles of Satellite Communication system, orbital mechanics and launchers.
2. To know about various satellite subsystem design.
3. To introduce about earth station technology and GEO satellite systems.
4. To know the basic concepts of various multiple access techniques.
5. To introduce the basic concepts of GPS technology.

UNIT I

INTRODUCTION TO SATELLITE COMMUNICATIONS: Origin of satellite communications, Historical background, basic concepts of satellite communications, frequency allocations for satellite services, applications, future trends of satellite communications. Orbital Mechanics - Orbital Mechanics, look angle determination, orbital perturbations, orbit determination, launches and launch vehicles, orbital effects in communication systems performance.

UNIT II

SATELLITE SUBSYSTEMS AND LINK DESIGN: Attitude and orbital control system, Telemetry, Tracking, command and monitoring, power systems, communication subsystems, satellite antenna equipment reliability and space qualification. Basic transmission theory, system noise temperature and G/T ratio, design of down links, uplink design, design of satellite links for specified C/N, system design example.

UNIT III

EARTH STATION TECHNOLOGY: Introduction, transmitters, receivers, Antennas, tracking systems, terrestrial interface, primary power test methods. Low Earth Orbit And Geo-Stationary Satellite Systems - Orbit consideration, coverage and frequency considerations, delay and throughput considerations, system considerations, operational NGSO constellation designs.

UNIT IV

MULTIPLE ACCESS: Frequency division multiple access (FDMA) Intermediation, calculation of C/N, Time Division multiple access (TDMA) frame structure. Satellite switched TDMA onboard processing, DAMA, code division multiple access (CDMA), spread spectrum transmission and reception.

UNIT V

SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM: Radio and satellite navigation, GPS position location principles, GPS receivers and codes, satellite signal acquisition, GPS navigation message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, differential GPS.

TEXT BOOKS:

1. Timothi Pratt, Charles Bostian and Jeremy Allnutt, "Satellite communications", WSE, Wiley publications, 2nd Edition, 2003.
2. Wilbur L.Prichard, Robert A. Nelson & Henry G.Suyderhoud, "Satellite communications Engineering", Pearson Publications, 2nd Edition, 2003.
3. D.C.Agarwal, "Satellite communications", Khanna publications, 5th Ed.

REFERENCE BOOKS:

1. Dennis Roddy, "Satellite communications", McGraw Hill, 2nd Edition, 1996.
2. M. Richharia, "Satellite communications: Design principles", BS publications, 2nd Edition, 2003.
3. K.N.Raja rao, "Fundamentals of Satellite communications", PHI, 2004.

Outcomes:

On completion of the course the students will be able to

1. Understand the basic principles of Satellite Communication system, orbital mechanics and launchers.
2. Understand various satellite subsystem design.
3. Analyze earth station technology and GEO satellite systems.
4. Understand the basic concepts of various multiple access techniques.
5. Understand basic concepts of GPS technology.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√											
CO-2			√									
CO-3			√	√								
CO-4	√		√									
CO-5					√							

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC39 CELLULAR AND MOBILE COMMUNICATIONS

Choice based Credit Course (Department Specific)

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. Basics of Cellular concepts and components of Cellular systems.
2. To Know about Channel interference and antenna parameters.
3. To Focus on the concept of signal reflection and mobile propagation.
4. To know Frequency management and channel assignment.
5. To know Different handoff mechanisms and GSM.

UNIT -I

CELLULAR MOBILE RADIO SYSTEMS: Introduction to Cellular Mobile system, Performance Criteria, Uniqueness of Mobile Radio environment, Operation of Cellular Systems, Hexagonal shaped cells, Analog and Digital Cellular systems. Elements Of Cellular Radio System Design - General description of the problem, Concept of frequency channels, Co-channel Interference Reduction Factor, Desired C/I from a normal case in a Omni directional Antenna system, Cell splitting, Consideration of the Components of Cellular System.

UNIT -II

INTERFERENCE: Introduction to Co-channel Interference, Real Time Co-channel Interference, Co-channel measurement, Design of Antenna System, Antenna Parameters and their effects, Diversity Receiver, Non-Co-channel Interference-Different Types.

UNIT -III

CELL COVERAGE FOR SIGNAL AND TRAFFIC: Signal Reflections in Flat and Hilly Terrain, Effect of Human Made Structures, Phase Difference Between Direct and Reflected Paths, Constant Standard Deviation, Straight Line Path Loss Slope, General formula for Mobile Propagation Over Water and Flat Open Area, Near and Long Distance Propagation Antenna Height Gain, Form of a Point to Point Model.

UNIT -IV

FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT: Frequency Management, Set-up Channels, Channel Assignments to Cell Sites and Mobile Units, Fixed Channel Assignment, Non Fixed Channel Assignment.

UNIT –V

HANDOFFS AND DROPPED CALLS: Handoff, Types of Handoff, Initiation of a Handoff, Delaying Handoff, Forced Handoff, Mobile Assigned Handoff (MAHO) and Soft Handoff, Intersystem Handoff, Dropped Calls, Dropped Call Rates and their Evaluation. Digital cellular networks - GSM architecture, GSM channels.

TEXT BOOKS:

1. W .C. Y. Lee, "Mobile Cellular Telecommunications", Tata Mc- Graw Hill, 2nd Edition, 2006.
2. Theodore. S. Rappaport, "Wireless Communications", Pearson Education, 2nd Edition, 2002.

REFERENCES BOOKS:

1. Gordon L. Stuber, "Principles of Mobile communications", Springer International 2nd Edition, 2007.
2. R. Blake, "Wireless Communication Technology", Thompson Asia Pvt. Ltd., 2004.
3. Das, Mullick & Chatterjee , "Principles of Mobile Communication", Wiley Eastern Ltd.

Outcomes:

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

1. Understand basics of Cellular concepts and components of Cellular systems.
2. Analyze the significance of Channel interference and antenna parameters.
3. Focus on the concept of signal reflection and mobile propagation.
4. Analyze the concept of Frequency management and channel assignment.
5. Understand different mechanisms and GSM.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√										√	√
CO-2		√					√					
CO-3				√	√				√			√
CO-4	√	√									√	
CO-5			√							√		√

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC40 RF SYSTEM DESIGN

Choice based Credit Course (Department Specific)

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student to:

5. Know about various filter realizations.
6. Know about the construction and functionality of BJT, FET and HEMT.
7. Know about various matching and biasing networks.
8. Design various RF transistor amplifier circuits.
9. Know about the design aspects of various Oscillator and Mixer circuits.

UNIT – I

AN OVERVIEW OF RF FILTER DESIGN: Basic Resonator & Filter configurations, Special filter realizations: Butterworth type and Chebyshev type, Filter implementation and Coupled filters.

UNIT-II

ACTIVE RF COMPONENTS AND ITS MODELING: Bipolar Junction Transistors, RF Field Effect Transistors and High Electron Mobility Transistors: Construction, Functionality, Frequency response and Temperature behavior. Transistor Model - Large signal and Small signal model of BJT and FET.

UNIT-III

MATCHING AND BIASING NETWORKS: Impedance Matching using discrete components, Microstripline matching networks, Amplifier- classes of operation and Biasing networks.

UNIT-IV

RF TRANSISTOR AMPLIFIER DESIGN: Characteristics of amplifiers, Amplifier power relations, Stability considerations, Constant gain, Broad-band, High power and Multi stage amplifiers.

UNIT-V

OSCILLATORS AND MIXERS: Basic oscillator model, Dielectric resonator oscillator, YIG Tuned oscillator and Voltage Controlled Oscillator. Characteristics of Mixers: Basic concepts, Frequency domain considerations, Single ended mixer design, Single balanced mixer and Double balanced mixer.

TEXT BOOKS:

1. Reinhold Ludwig & Pavel Bretchko, "RF Circuit Design, Theory and Applications", Prentice Hall, 2002.
2. Mathew M. Radmanesh, "Radio Frequency and Microwave Electronics Illustrated" Pearson Higher Education, First Edition, 2009.

REFERENCE BOOKS:

1. Thomas H. Lee "The Design of CMOS Radio-Frequency Integrated Circuits" Second Edition, Cambridge University press, 2008.
2. B.Razavi, "RF Microelectronics", Second Edition, Prentice Hall, 2011.

Outcomes:

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

5. *Understand* various filter realizations.
2. Understand the construction and functionality of BJT, FET and HEMT.
3. Design matching and biasing networks.
4. Design a RF transistor amplifier for different applications.
5. Design Oscillator and Mixer circuits.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√		√								√	√
CO-2	√		√								√	√
CO-3			√		√							
CO-4			√		√							
CO-5			√		√							

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC41 BIO-MEDICAL INSTRUMENTATION

Choice based Credit Course (Department Specific)

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To know about the basic medical instrumentation system, its requirements and various electrodes used in measurements.
2. To know about the importance of various biomedical recorders.
3. To understand the importance of Cardiac Pacemakers, Defibrillators, and Haemodialysis machine.
4. To know about electric shock hazards and safety codes for electromedical equipment.
5. To understand the operation of X-ray machine, X-ray CT and Nuclear Magnetic Resonance system etc.

UNIT – I

BIO-ELECTRIC SIGNALS AND ELECTRODES: Basic Medical Instrumentation System and Performance requirements of Medical Instrumentation Systems, Origin of Bioelectric signals, Recording Electrodes, Silver-silver Chloride electrodes, Electrodes for ECG, Electrodes for EEG, Electrodes for EMG, Electrical Conductivity of Electrode Jellies and Creams and Microelectrodes.

UNIT-II

BIOMEDICAL RECORDERS: Electrocardiograph, Vectorcardiograph, Phonocardiograph, Electroencephalograph, Electromyograph and Other Biomedial Recorders-BCG, EOG and ERG.

UNIT-III

THERAPEUTIC AND PROSTHETIC DEVICES: Cardiac Pacemakers: Need for Cardiac Pacemaker, External Pacemakers, Implantable Pacemakers and Recent developments in Implantable Pacemakers. Cardiac Defibrillators: Need for a Defibrillator, DC Defibrillator and Implantable Defibrillators. Schematic Diagram of a Haemodialysis Machine, High frequency Heat Therapy, Short-wave Diathermy and Microwave Diathermy.

UNIT-IV

PATIENT SAFETY: Electric Shock Hazards, Leakage Currents, Safety Codes for Electromedical Equipment, Electrical Safety Analyzer and Testing of Biomedical Equipment.

UNIT-V

MEDICAL IMAGING SYSTEMS: Basic Principle and Block diagram of X-ray machine, Basic Principle and Technique of X-ray Computed Tomography, Basic Nuclear Magnetic Resonance components, Positron Emission Tomography, Ultrasonography: A-Scan, M-Mode, B-Scanner and Real Time Ultrasonic Imaging Systems.

TEXT BOOKS:

1. R.S.Khandpur, "Handbook of Bio-Medical instrumentation", Third Edition, McGraw Hill Education (India) Private Limited, 2014.
2. Leslie Cromwell, Fred J.Weibell, Erich A.Pfeiffer, "Bio-Medical Instrumentation and Measurements" Second Edition, Prentice Hall of India, 2004.

REFERENCE BOOKS:

1. John G.Webster, "Medical Instrumentation Application and Design", Forth Edition, John Wiley & Sons, 2009.
2. M.Arumugam, "Bio-Medical Instrumentation", Anuradha Agencies, 2010.

Outcomes:

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

1. Understand the basic medical instrumentation system, its requirements and different electrodes used in recording.
2. Understand the working principle of various biomedical recorders.
3. Understand the importance of Cardiac Pacemakers, Defibrillators, and Haemodialysis machine and its usage.
4. Understand various electric shock hazards and importance of safety codes for electromedical equipment.
5. Understand the working principle of various medical imaging systems such as X-ray machine, X-ray CT and Nuclear Magnetic Resonance system etc.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√	√	√		√						√	√
CO-2	√	√	√		√						√	√
CO-3	√		√		√						√	√
CO-4	√		√		√						√	√
CO-5	√		√		√						√	√

Sri Venkateswara College of Engineering and Technology (Autonomous), Chittoor.

14AEC42 ADVANCED MICROCONTROLLERS AND APPLICATIONS

Choice based Credit Course (Department Specific)

	L	T	P	C
IV B.Tech-I Semester ECE	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To know the Architecture of 8051 microcontroller.
2. To know the Assembly Language Programming using 8051 microcontroller.
3. To know how to interface external devices with microcontroller.
4. To study about 16/32 bit microcontrollers.
5. To study about RTOS concepts for microcontrollers.

UNIT-I

OVERVIEW OF ARCHITECTURE AND MICROCONTROLLER RESOURCES: Architecture of a microcontroller – Microcontroller resources – Resources in advanced and next generation microcontrollers – 8051 microcontroller – Internal and External memories – Counters and Timers – Synchronous serial-cum asynchronous serial communication - Interrupts.

UNIT-II

8051 FAMILY MICROCONTROLLERS INSTRUCTION SET: Basic assembly language programming – Data transfer instructions – Data and Bit-manipulation instructions – Arithmetic instructions – Instructions for Logical operations, Internal RAM, and SFRs – Program flow control instructions – Interrupt control flow.

UNIT-III

REAL TIME CONTROL: Interrupts, Interrupt handling structure of an MCU – Interrupt Latency and Interrupt deadline – Multiple sources of the interrupts – Non-maskable interrupt sources – Enabling or disabling of the sources – Polling to determine the interrupt source and assignment of the priorities among them – Interrupt structure in Intel 8051. Real Time Control Timers - Programmable Timers in the MCU's – Free running counter and real time control – Interrupt interval and density constraints. Real Time OS For Microcontrollers: Real Time operating system – RTOS of Keil (RTX51) – Use of RTOS in Design – Software development tools for Microcontrollers.

UNIT-IV

SYSTEMS DESIGN: DIGITAL AND ANALOG INTERFACING METHODS: Switch, Keypad and Keyboard interfacings – LED and Array of LEDs – Keyboard-cum-Display controller (8279)–Alphanumeric Devices – Display Systems and its interfaces – Printer interfaces – Programmable instruments interface using IEEE 488 Bus – Interfacing with the Flash Memory – Interfaces – Interfacing to High Power Devices – Analog input interfacing – Analog output interfacing –Prototype MCU based Measuring instruments – Robotics and Embedded control – Digital Signal Processing and Digital Filters.

UNIT-V:

16/32 - BIT MICROCONTROLLERS : Hardware – Memory map in Intel 80196 family MCU system – IO ports –Progammable Timers and High-speed outputs and input captures – Interrupts – instructions. ARM 32 BIT MCUS - Introduction to 16/32 Bit processors – ARM architecture and organization – ARM / Thumb programming model – ARM / Thumb instruction set – Development tools.

TEXT BOOKS:

1. Raj Kamal, "Microcontrollers Architecture, Programming, Interfacing and System Design" Pearson Education, 2005.
2. Mazidi and Mazidi, "The 8051 Microcontroller and Embedded Systems", PHI, 2000.

REFERENCE BOOKS:

1. A.V. Deshmuk, "Microcontrollers (Theory & Applications)" WTMH, 2005.
2. John B. Peatman, "Design with PIC Microcontrollers", Pearson Education, 2005.
3. Wayne Wolf, "Computer as components: Principals of Embedded System Design".

Outcomes:

On completion of the course the students will be able to

1. Write assemble language programs using 8051 microcontroller
2. Interface various devices with microcontrollers
3. Design various embedded systems using Microcontrollers.
4. Use ARM Microcontroller in various Applications.
5. Use RTOS concepts for microcontrollers.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO-1	√	√										
CO-2			√		√							
CO-3			√									
CO-4		√										
CO-5						√						

Sri Venkateswara College of Engineering and Technology, (Autonomous), Chittoor.

14AEC43 DIGITAL SIGNAL PROCESSING LAB	**L**	**T**	**P**	**C**
	-	**-**	**4**	**2**

IV B.Tech-I Semester ECE

Objectives:

To enable the students to

1. Understand circular convolution, its relationship to linear convolution.
2. Understand the FFT algorithm for efficient computation of the DFT.
3. Use the Fast Fourier Transform algorithm in a variety of applications.
4. Design digital FIR filters using the window method.
5. Design digital IIR filters by designing prototype analog filters.

LIST OF EXPERIMENTS

1. To study the architecture of DSP chips – TMS 320C 5X/6X Instructions.
2. Compute linear convolution using CC Studio and verify using MATLAB.
3. Compute circular convolution using CC Studio and verify using MATLAB.
4. To design FIR filter (LP/HP) using windowing technique
   a) Using rectangular window
   b) Using triangular window
   c) Using Hamming window
5. To Design IIR filter (LP/HP)
6. Implement 8-point FFT algorithm and verify using MATLAB.
7. MATLAB program to generate sum of sinusoidal signals.
8. To compute Auto-Correlation/Cross-Correlation.
9. MATLAB program to find frequency response of analog LP/HP filters.
10. To compute power density spectrum of a sequence.
11. To find the FFT of given 1-D signal and plot.
12. To Compute DFT and IDFT of the given Sequence.

Outcomes:

On completion of the lab the student will be able to

1. Perform Circular convolution and linear convolution.
2. Apply FFT algorithm for efficient computation of the DFT and IDFT.
3. Apply the FFT algorithm to find FFT of 1-D signal, to compute power density spectrum of a sequence.
4. Design digital FIR filters using the window method.
5. Design digital IIR filters by designing prototype analog filters and then applying analog to digital conversion techniques.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√	√			√				√	√	√	
CO-2					√				√	√		√
CO-3	√	√			√	√						
CO-4	√	√			√	√			√	√	√	√
CO-5	√	√			√	√			√	√	√	√

Sri Venkateswara College of Engineering and Technology, (Autonomous), Chittoor.

14AEC44 MICROWAVE AND OPTICAL COMMUNICATIONS LAB	L	T	P	C
IV B.Tech-I Semester ECE	-	-	4	2

Objectives:

To enable the students
1. To analyze the micro-wave bench setup to measure characteristics of different components.
2. To analyze the scattering parameters of different microwave components.
3. To educate the students about the basic concepts of optical communication links.
4. To analyze the behaviour microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
5. To educate the students about LASER diode.

Note: Minimum **Ten** Experiments to be conducted
(Minimum **Seven** from **Part A** and **Three** from **Part B**)

Part – A

1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Attenuation Measurement.
4. Directional Coupler Characteristics.
5. VSWR Measurement.
6. Impedance Measurement.
7. Waveguide parameters measurement.
8. Scattering parameters of Directional Coupler.
9. Scattering parameters of Magic Tee.

Part – B

1. Characterization of LED.
2. Characterization of Laser Diode.
3. Intensity modulation of Laser output through an optical fiber.
4. Measurement of Data rate for Digital Optical link.
5. Measurement of NA.
6. Measurement of losses for analog Optical link.

Outcomes:

On completion of the lab the student will be

1. Able to understand the microwave bench setup to measure different parameters like VSWR, attenuation, impedance etc.
2. Able to understand the S - parameters of Directional Coupler, E-Plane Tee, H-Plane Tee, Magic Tee and Circulators.
3. Able to design a simple optical communication link.
4. Able to understand the usage of microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
5. Able to understand the basic characteristics of LASER diode.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√	√							√	√		
CO-2	√	√							√	√		
CO-3		√			√				√	√		
CO-4	√	√	√		√				√	√		
CO-5		√			√				√	√		

Sri Venkateswara College of Engineering and Technology, Chittoor.
(Autonomous)

14AMB02 PROFESSIONAL ETHICS	L	T	P	C
(Audit Course)				
IV B.Tech-I Semester ECE	3	-	-	-

Objectives:

The course will provide the student:

1. To understand the fundamental concepts of professional ethics.
2. To impart and inculcate ethical decision making.
3. To apply ethical and human values in engineering profession.
4. To prepare engineering students to meet global demands on human values.
5. To explain the importance of environmental protection in engineering activities

UNIT-I

INTRODUCTION: Professionalism-models of professionalism-Ethics-Types of ethics and morality-Engineering ethics-Positive and negative faces of ethics-Responsibility for safety-Technology pessimism and perils of technological optimism.

UNIT-II

ETHICAL CONCEPTS: Human Values – morals-integrity-work ethics-Respect for others-respect for authority-conflicts of interests-moral dilemmas-honesty- courage-cooperation-valuing time-commitment-collegiality-loyalty-self -interest-Professional accountability-royalty-Problem of bribery, extortion and grease payments-problem of nepotism, excessive gifts-confidentiality-uses of ethical theories-Kohlberg's Theory- Gilligan`s Theory-Ethical codes of IEEE and Institution of Engineers.

UNIT- III

ENGINEERS ROLE IN SAFETY: Safety and risks-risk and costs-risk benefit analysis-Testing methods for safety-The promise of technology-Computer Technology Privacy-Social policy-Engineering standards-the standards care-Social and value dimensions of technology-communicating risk and public policy-occupational crime-professional rights and employee rights-whistle blowing.

UNIT- IV

ROLES OF ENGINEERS: Engineers as managers, Advisors, Consultants, Experts and witnesses- Engineers role in industry and society- models of professional roles-Theories about right action-paternalism-different business practices-Moral leadership- Cases - Bhopal gas tragedy, Nuclear power plant disasters.

UNIT –V

ENVIRONMENTAL ETHICS: Global Issues-Multinational corporations-Living in harmony with NATURE-Holistic technology-Eco friendly production system-sustainable technology and development-weapon development-Four orders of living, their interconnectedness-Eco system-Ozone depletion-,pollution

TEXT BOOKS:

1. Subramanian R, Professional Ethics,1st Edition, Oxford University Press. 2013.
2. Naagarazan , R.S., A Textbook on Professional Ethics and Human Values,1st edition, New Age International (P) Limited, Publishers New Delhi.,2014

REFERENCE BOOKS:

1. Fundamentals of Ethics for scientists and Engineers, Edmond G Seebauer and Robert L. Barry, 1st edition Oxford University Press, 2008.
2. R. R. Gaur, R. Sangal and G. P. Bagaria, Human Values and Professional Ethics:, Eecel Books,New Delhi.2010.
3. Professional Ethics and Human Values – M.Govindrajan, S.Natarajan and V.S. Senthil Kumar, PHI Learning Pvt. Ltd. Delhi.
4. Professional Ethics and Human Values: Prof. D.R. Kiran, TATA McGraw Hill Education, 2007.
5. Charles D Fleddermann, “Engineering Ethics”, Prentice Hall.
6. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning.

Outcomes:

After completion of this course students will be able to:

1. Understand human values and ethical standards to lead career accordingly.
2. Able to incorporate appropriate safety measures in designing systems.
3. Play the role of "responsible engineer" in the society.
4. Use natural resources in a sustainable manner and be conscious of environment.
5. Incorporate safety measures in engineering and product design aspects.

MAPPING OF COs with POs:

COURSES OUTCOMES	PROGRAM OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO-1	√								√	√		√
CO-2	√						√		√	√		
CO-3		√			√				√	√		
CO-4	√	√	√		√				√	√		
CO-5		√			√			√	√	√		