ACADEMIC REGULATIONS (R-14)
COURSE STRUCTURE
AND
DETAILED SYLLABI
FOR

B. Tech Regular Four Year Degree Courses

(For the Batches Admitted From 2014-2015)

&

B. Tech (Lateral Entry Scheme)

(For the Batches Admitted From 2015-2016)

ELECTRICAL AND ELECTRONICS ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

R.V.S. Nagar, CHITTOOR – 517 127, A.P

Phones: (08572) 246339, 245044 Fax: (08572) – 245211

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)
R.V.S. NAGAR, CHITTOOR-517127. A.
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
REVISED SCHEME OF INSTRUCTIONS FROM I B.Tech TO IV B.Tech (EEE) – R14

I B.Tech, I Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total
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	14AEE01	Electrical Circuits-I	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		Internal	External	Total
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 & 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 & Circuits Lab	-	-	3	2	30	70	100
		TOTAL	14	3	13	22	240	560	800

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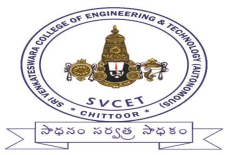
REVISED SCHEME OF INSTRUCTIONS FROM I B.Tech TO IV B.Tech (EEE) – R14

II B.Tech, I Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total
1	14AHS11	Engineering Mathematics –III	3	1	-	3	30	70	100
2	14AHS12	Managerial Economics and Financial Analysis	3	1	-	3	30	70	100
3	14ACE11	Fluid Mechanics and Hydraulic Machinery	3	1	-	3	30	70	100
4	14AEC05	Switching Theory And Logic Design	3	1	-	3	30	70	100
5	14AEE04	Electrical Circuits – II	3	1	-	3	30	70	100
6	14AEE05	Electrical Machines –I	3	1	-	3	30	70	100
7	14AEE07	Electrical Circuits Lab	-	-	3	2	30	70	100
8	14AEE08	Electrical Machines-I 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
1	14AEC15	Analog and Digital Electronic Circuits	3	1	-	3	30	70	100
2	14AEC06	Signals & Systems	3	1	-	3	30	70	100
3	14AEE10	Generation of Electrical Power	3	1	-	3	30	70	100
4	14AEE11	Electromagnetic Fields	3	1	-	3	30	70	100
5	14AEE12	Electrical Measurements and Instrumentation	3	1	-	3	30	70	100
6	14AEE13	Electrical Machines-II	3	1	-	3	30	70	100
7	14AEC16	Pulse and Digital Circuits Lab	-	-	3	2	30	70	100
8	14AEE16	Electrical Measurements and Instrumentation lab	-	-	3	2	30	70	100
		TOTAL	18	6	6	22	240	560	800
	14AHS15	Quantitative Aptitude and Reasoning – I (Audit Course)	3	-	-	-	-	-	-



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
REVISED SCHEME OF INSTRUCTIONS FROM I B.Tech TO IV B.Tech (EEE) – R14

III B.Tech, I Semester

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total
1	14AEE18	Transmission of Electrical Power	3	1	-	3	30	70	100
2	14AEE19	Power Electronics	3	1	-	3	30	70	100
3	14AEE20	Control Systems	3	1	-	3	30	70	100
4	14AEC20	Microprocessors & Microcontrollers	3	1	-	3	30	70	100
5	14AEE21	Electrical Machines –III	3	1	-	3	30	70	100
6	14AEE22	Switch Gear & Protection	3	1	-	3	30	70	100
7	14AEE23	Electrical Machines –II Lab	-	-	4	2	30	70	100
8	14AEE24	Control Systems Lab	-	-	4	2	30	70	100
9	14AEE25	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
1	14AHS13	Technical English –II	3	1	-	3	30	70	100
2	14AEE26	Power Semiconductor Drives	3	1	-	3	30	70	100
3	14AEE27	Power System Analysis	3	1	-	3	30	70	100
4	14AEE28	Electric Power Distribution	3	1	-	3	30	70	100
5	14AEC28	Digital Signal Processing	3	1	-	3	30	70	100
CHOICE BASED INTER DEPARTMENT COURSES									
6	14ACS12	Object oriented programming through java	3	1	-	3	30	70	100
	14AEC30	Basic Communication Systems							
	14AME58	Robotics							
7	14AHS14	Technical English Lab – II	-	-	4	2	30	70	100
8	14AEC32	Microprocessors & Microcontrollers Lab	-	-	4	2	30	70	100
9	14AEE29	Comprehensive online Examination	-	-	-	1	-	100	100
		TOTAL	18	6	6	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
1	14AEE30	Renewable Energy Sources and Smart Grid Technology	**3**	**1**	**-**	**3**	**30**	**70**	**100**
2	14AEE31	Utilization of Electrical Energy	**3**	**1**	**-**	**3**	**30**	**70**	**100**
3	14AEE32	Advanced Control Systems	**3**	**1**	**-**	**3**	**30**	**70**	**100**
4	14ACS15	Data Base Management Systems	**3**	**1**	**-**	**3**	**30**	**70**	**100**
CHOICE BASED CREDIT COURSES (DEPARTMENT SPECIFIC)									
5	14AEE33	Power systems operation & control	**3**	**1**	**-**	**3**	**30**	**70**	**100**
	14AEE34	High Voltage Engineering							
	14AEE35	Design of Electrical Systems							

S. No	Course Code	Subject	Hours / Week			Credits	Maximum Marks		
			L	L	L		Internal	External	Total
CHOICE BASED CREDIT COURSES (DEPARTMENT SPECIFIC)									
6	14AEE36	HVDC Transmission	**3**	**1**	**-**	**3**	**30**	**70**	**100**
	14AEE37	Soft Computing Techniques							
	14AEE38	Energy Auditing and Demand Side Management							
7	14AEE39	Power Electronics & Drives Lab	**-**	**-**	**4**	**2**	**30**	**70**	**100**
8	14AEE40	Electrical systems and Simulation Lab	**-**	**-**	**4**	**2**	**30**	**70**	**100**
		Total	**18**	**6**	**8**	**22**	**240**	**560**	**800**
	14AMB02	Professional Ethics (Audit Course)	**3**	**-**	**-**	**-**	**-**	**-**	**-**

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

14AEE18 TRANSMISSION OF ELECTRICAL POWER L T C

III B.TECH –I SEMESTER EEE 3 1 3

- **OBJECTIVES:**
  1. *To acquire knowledge on Transmission line parameters and their calculation for various configurations of transmission lines.*
  2. *To gain adequate knowledge on performance specifications of Transmission lines such as regulation and efficiency for various models of lines.*
  3. *To study the power system transients and Corona.*
  4. *To study Overhead line insulators and mechanical aspects of Transmission lines such as Sag and Tension effects.*
  5. *To study the constructional features of underground cables and their performance.*

UNIT- I

TRANSMISSION LINE PARAMETERS: Types of conductors - calculation of resistance for solid conductors - Calculation of inductance for single phase and three phase - single and double circuit lines - concept of GMR & GMD - symmetrical and asymmetrical conductor configuration with and without transposition - Numerical Problems - Calculation of capacitance for 2-wire and 3-wire systems - effect of ground on capacitance - Capacitance calculations for single phase and symmetrical three phase lines- Numerical Problems.

UNIT-II

PERFORMANCE OF TRANSMISSION LINES: Classification of Transmission Lines - Short, medium and long transmission lines and their model - representations - Nominal-T, Nominal-∏ and A, B, C, D Constants - Mathematical Solutions to estimate regulation and efficiency of all types of lines - Numerical Problems-Long Transmission Line - Rigorous Solution - evaluation of A,B,C,D Constants - Interpretation of the Long Line Equations – Representation of Long lines–surge Impedance and surge Impedance loading - Ferranti effect .

UNIT- III

POWER SYSTEM TRANSIENTS: Types of System Transients - Travelling or Propagation of Surges - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-Junction, Lumped Reactive Junctions (Numerical Problems).

CORONA: Corona - Description of the phenomenon - factors affecting corona - critical voltages and power loss - Radio Interference.

UNIT- IV

OVERHEAD LINE INSULATORS: Types of Insulators - String efficiency - Methods for improvement - voltage distribution - calculation of string efficiency - Capacitance grading and Static Shielding-numerical problems.

SAG AND TENSION CALCULATIONS: Sag and Tension Calculations with equal and unequal heights of towers - Effect of Wind and Ice on weight of Conductor - Numerical Problems - Stringing chart and sag template and its applications.

UNIT- V

UNDERGROUND CABLES: Types of Cables – Construction - Types of Insulating materials - Calculations of Insulation resistance and stress in insulation - Numerical Problems - Capacitance of single core and three Core belted cables - Numerical Problems - Grading of Cables - Capacitance grading - Numerical Problems - Description of Inter-sheath grading.

- **TEXT BOOKS:**

1.Soni M.L, Gupta P.V, Bhatnagar U.S, Chakrabarthy.A: A Text Book on Power System Engineering, Dhanpat Rai & Co Pvt. Ltd.

2.Wadhwa C.L: Electrical power systems, New Age International (P) Limited, Publishers, 1998.

- **REFERENCE BOOKS:**

1. Rajput R. K: *Power System Engineering*, Laxmi Publications, 1st Edition.

2. Gupta B.R: *Power System Analysis and Design*, 6th Revised Edition, S. Chand & Co, 2010.
3. Nagarath I.J and Kothari D.P: *Modern Power System Analysis*, 2nd Edition, Tata McGraw Hill.

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

14AEE19 POWER ELECTRONICS L T C

III B.TECH –I SEMESTER EEE 3 1 3

- **OBJECTIVES:**
  1. *To understand the basic theory of power semiconductor switches such as power BJT, SCR, MOSFET, IGBT and their triggering and commutation mechanisms.*
  2. *To understand the operation of single phase and three phase controlled rectifiers with R, RL, RLE loads and effect of source inductance and freewheeling diode on converter performance.*
  3. *To know about control strategies of Choppers and their performance with R, RL loads and switched mode regulators*
  4. *To impart knowledge on AC voltage controllers and line commutated converters*
  5. *To understand the operation of inverters and cyclo-converters with R, RL and RLE Loads and their applications.*

UNIT- I

POWER SEMICONDUCTOR DEVICES: Thyristors – Silicon Controlled Rectifiers (SCR's) – Power MOSFET – Power IGBT and their characteristics - Basic theory of operation of SCR - Ratings – Static & Dynamic characteristics of SCR – Turn on and turn off methods -Two transistor analogy – SCR Firing Circuits – R, RC and UJT firing circuits – Series and parallel connections of SCR's – Snubber circuit– Commutation Methods - Line Commutation and Forced Commutation circuits–Numerical problems.

UNIT- II

SINGLE PHASE HALF & FULLY CONTROLLED CONVERTERS: Phase control technique – Single phase Line commutated converters – Midpoint and Bridge connections – Half controlled converters with R, RL and RLC loads – Derivation of average load, voltage and current –Effect of freewheeling diode –Fully controlled converters - Midpoint and Bridge

connections with R, RL loads - Derivation of average load voltage and current – Line commutated inverters –Effect of Freewheeling Diode - Effect of source inductance – Derivation of load voltage and current equations – Numerical problems.

UNIT- III

DC CHOPPERS: Principle and operation of step up and step down chopper circuit- control strategies Time ratio control and Current limit– Types of Chopper Circuits -Derivation of load voltage and currents with R, RL and RLE loads - AC Chopper - Load voltage Expression – Switch mode regulator – Buck and Boost regulators

UNIT- IV

THREE PHASE LINE COMMUTATED CONVERTERS: Three phase converters – Three pulse and six pulse converters – Midpoint and bridge connections average load voltage With R and RL loads – Effect of Source inductance – Dual converters (both single phase and three phase) - Waveforms – Numerical Problems.

AC VOLTAGE CONTROLLERS: AC voltage controllers – Single phase two SCR's in anti parallel with R and RL loads – Modes of operation of Triac – Triac with R and RL loads – Derivation of RMS load voltage, Current and Power Factor wave forms – Firing circuits - Numerical problems.

UNIT- V

CYCLOCONVERTERS: Single phase Midpoint cycloconverters with Resistive and Inductive Load (Principle of operation only) – Bridge configuration of single phase cycloconverter (Principle of operation only) – Waveforms.

INVERTERS: Single phase bridge Inverter – Single phase Half Bridge and Full Bridge configuration - Three phase Half Bridge and Full Bridge configuration - Voltage control techniques for inverters - Pulse Width Modulation Techniques –Numerical problems

- **TEXT BOOKS:**

1. Dr.Bimbhra.P.S: *Power Electronics*, Kanna publishers,2010
2. Singh.M.D & Kanchandhani.K.B: *Power Electronics*, Tata Mc Graw – Hill Publishing Company, 1998.

- **REFERENCE BOOKS:**

1. Rashid.M.H: *Power Electronics Circuits, Devices and Applications*, 2nd edition, Prentice Hall of India, 1998.
2. Dubey.G.K, Doradla.S.R, Joshi.A and Sinha.R.M.K: *Thyristorised Power Controllers*, New Age International (P) Limited Publishers, 1996.
3. Sen.P.C: *Power Electronics*, Tata Mc Graw-Hill Publishing.

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

	L	T	C
14AEE20 CONTROL SYSTEMS			
III B.TECH –I SEMESTER (COMMON TO EEE & 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 steady state errors.*
  3. *To study the different techniques of stability analysis and their limitations.*
  4. *To acquire the knowledge about frequency response analysis and determine the performance parameters.*
  5. *To understand the design of compensating techniques to improve the steady state error and concept of the state space analysis for continuous system*

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, Farid Golnaraghi: *Automatic Control Systems*, 8th edition,2003 John wiley and sons.
3. Nagrath.I.J and Gopal.M: *Control Systems Engineering*, 5th edition, New Age International (P) Limited Publishers, 2007.

- **REFERENCE BOOKS:**

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

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

14AEC20 MICROPROCESSORS AND MICROCONTROLLERS

III B.TECH –I SEMESTER (COMMON TO EEE & ECE)

L	T	C
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 ICROPROCESSOR:

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. Douglas V.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

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14AEE21 ELECTRICAL MACHINES-III

III B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**

1. *To study the construction, working principle and performance of salient pole and non-salient pole types of synchronous generators.*
2. *To Understand the concepts of various types of voltage regulation methods of synchronous generators.*
3. *To acquire knowledge about parallel operation of synchronous generators and load sharing*
4. *To know the principle of operation of synchronous motor, its characteristics, determination of V and inverted V curves and starting methods*
5. *To know the principle of single phase Induction motor and their applications and also study of special machines*

UNIT- I

SYNCHRONOUS GENERATOR: Constructional features of round rotor and salient pole machines – Armature windings – Integral slot and fractional slot windings - Distributed and concentrated windings – Distribution, pitch and winding factors – E.M.F Equation – Characteristics - OCC & SC Test - Harmonics in generated E.M.F – Suppression of Harmonics – Armature reaction - Leakage reactance – Synchronous reactance and Impedance – Experimental Determination - Phasor diagram – Load characteristics .

UNIT- II

REGULATION OF SYNCHRONOUS GENERATOR: Synchronous impedance method - M.M.F method - Z.P.F method and A.S.A methods – Salient-pole alternators – Two reaction

analysis – Experimental Determination of X_d and X_q (Slip test) - Phasor diagrams – Regulation of Salient pole alternators.

UNIT- III

PARALLEL OPERATION OF SYNCHRONOUS GENERATORS: Synchronizing alternators with infinite bus bars – Synchronizing power, Torque – parallel operation and load sharing - Effect of change of excitation and mechanical power input - Analysis of short circuit current wave form – Determination of sub-transient - Transient and steady state Reactance's.

UNIT- IV

SYNCHRONOUS MOTORS: Principle Of Operation - Phasor diagram – Characteristics of Synchronous Motors - Variation of current and power factor with excitation – V and Inverted V Curves - Power developed – Synchronous Condenser - Power Circles - Excitation and power circles – Hunting and its suppression – Methods of starting – Synchronous Induction motor.

UNIT- V

SINGLE PHASE MOTORS: Single phase Induction motor – Constructional features - Double revolving field theory – Elementary idea of cross-field theory – Split-phase motors – Shaded pole motor.

SPECIAL MOTORS: Principle & performance of A.C. Series motor-Universal motor – Principle of Permanent Magnet Synchronous Motor (PMSM) – Brushless DC Motor (BLDC) – Switch Reluctance Motor (SRM) - stepper motor.

- **Text Books:**
  1. *Nagrath.I.J & Kothari.D.P: Electric Machines, 4th Edition, Tata Mc Graw-Hill Publishers, 2010.*
  2. *Bimbra.P.S: Electrical Machines, Khanna Publishers.*

- **REFERENCES:**
  1. *Say.M.G: The Performance and Design of A.C Machines, ELBS and Pitman & Sons*

2. *Langsdorf: Theory of Alternating Current Machinery, 2nd edition, Tata Mc Graw-Hill.*
3. *Fitzgerald.A.E, Kingsley.C and Umans.S: Electric Machinery, 5th edition Mc Graw-Hill Companies, 1990.*

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

14AEE22 SWITCH GEAR & PROTECTION

III B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**
  1. *To know the principles of various types of circuit breakers and their description.*
  2. *To know the basic requirements of different types of relays and their characteristics.*
  3. *To know about the various protection schemes available for protection of generators and transformers.*
  4. *To identify the schemes suitable for feeders and transmission protection.*
  5. *To know over voltage protection, insulation co-ordination and BIL.*

UNIT- I

CIRCUIT BREAKERS: Elementary principles of arc interruption - Restriking Voltage and Recovery voltage - Restriking Phenomenon - Average and Maximum RRRV - Numerical Problems - Current Chopping and Resistance Switching, Description and Operation of Minimum Oil Circuit breakers - Air Blast Circuit Breakers - Vacuum and SF_6 circuit breakers. Introduction to Gas insulated Substation.

UNIT- II

RELAYS: Basic Requirements of Relays – Primary and Backup protection - Construction details – Attracted armature, balanced beam, Induction type and Differential type relays – Universal Torque equation – Characteristics of over current - Directional and Distance relays. Static Relays – Advantages and Disadvantages – Definite time, Inverse and IDMT static relays – Comparators – Amplitude and Phase comparators - Microprocessor based relays – Block Diagram for Over current and Distance relays and their flow charts only.

UNIT- III

PROTECTION OF GENERATOR AND TRANSFORMER: Protection of generators against Stator faults, Rotor faults and abnormal Conditions - Restricted Earth fault and Inter-turn fault Protection - Numerical Problems on Percentage Winding Unprotected. Protection of transformers - Percentage Differential Protection - Numerical Problem on Design of CT's Ratio - Buchholtz relay Protection.

UNIT -IV

PROTECTION OF FEEDERS AND TRANSMISSION LINES: Protection of Feeder (Radial & Ring main) using over current Relays - Protection of Transmission line 3-Zone protection using Distance Relays - Carrier current protection - Protection of Bus bars.Power swing analysis.

UNIT -V:

PROTECTION AGAINST OVER VOLTAGES: Generation of Over Voltages in Power Systems - Protection against Lightning Over Voltages – Types of Lightning Arresters - Insulation Coordination – BIL.

- **TEXT BOOKS:**

1. *Badari Ram, Viswakarma.D.N: Power System Protection and Switchgear, TMH Publications.*
2. *A. Chakrabarti,M.L.Soni,P.V.Gupta,U.S.Bhatnagar: A Text Book on Power system Engineering, Dhanpat Rai & Co.*

- **REFERENCE BOOKS:**

1. *Wadhwa.C.L: Electrical Power Systems, 3rd edition, New Age international (P) Limited.*
2. *Bhuvanesh Oza: Power System protection and switch gear, TMH 2010.*
3. *Paithankar.Y.G: Transmission network protection, Taylor and Francis,2009*

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

14AEE23 ELECTRICAL MACHINES-II LAB

III B.TECH –I SEMESTER EEE

L	T	P	C
-	-	4	2

- **OBJECTIVES:**
  1. *To acquire knowledge about no load test on single phase transformer and three phase induction motor*
  2. *To understand sumpner's test on single phase transformers.*
  3. *To study the Blocked rotor and No-Load test on 3ϕ Induction motor to determine the performance curves*
  4. *To study the EMF, MMF, ZPF and ASA methods of regulation of alternators*
  5. *To study the V and inverted V curves of synchronous motor by conducting No load and Load test.*

PART-A:

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

1. OC and SC test on Single phase Transformer- Determination of equivalent circuit parameters and predetermination of efficiency and regulation.
2. Sumpner's Test on a pair of single phase transformers- Determination of efficiency.
3. Conversion of three-phase to two single phase supply using Scott connection of transformer.
4. No-load and Blocked Rotor tests on a three phase induction motor-Predetermination of performance curves by drawing circle diagram.
5. Load Test on Three-phase Induction Motor-Determination of performance curves.
6. OCC and SC tests on three phase alternator- predetermination of regulation and efficiency by EMF, MMF and Potier triangle methods.

7. No load and load tests on a three phase synchronous motor-Determination of V-Curves and Λ -curves.

PART-B:

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

8. Determination of X_d and Xq on a salient pole synchronous machine.
9. Parallel operation of two single phase transformers.
10. No load and blocked rotor tests on single phase Induction Motor-Determination of equivalent circuit parameters.
11. Separation of core losses of a single phase transformer.
12. Heat run test on single phase transformer.

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

14AEE24 CONTROL SYSTEMS LAB

III B.TECH –I SEMESTER EEE

L	T	P	C
-	-	4	2

- **OBJECTIVES:**
  1. *To acquire knowledge about time response of second order systems using controllers*
  2. *To determine transfer function of DC machine*
  3. *To study the magnitude and phase plots using compensation techniques*
  4. *To study the PLC controller and its applications in electrical system*
  5. *To obtain the characteristics of servomotors, synchros & magnetic amplifiers*

PART-A:

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

1. Time response of Second order system using P,PI & PID controller.
2. Transfer function of DC Motor using Armature voltage control and field control.
3. Characteristics of Synchros
4. Characteristics of AC servo motor
5. Effect of feedback on DC servo motor
6. Lag ,Lead & Lead- Lag compensation – Magnitude and phase plots
7. Simulation of Transfer function using OP-AMP.

PART-B:

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

8. Characteristics of magnetic amplifiers
9. Temperature controller using PID
10. Programmable logic controller-study and verification of truth tables of logic gates simple Boolean expressions and application of speed control of the motor

11. Transfer function of DC generator
12. Effect of P,PI,PID controllers on a second order systems

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

14AEE25 COMPREHENSIVE ONLINE EXAMINATION

III B.TECH –I SEMESTER EEE

L	T	P	C
-	-	-	1

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

14AHS16 QUANTITATIVE APTITUDE AND REASONING -II

III B.TECH –I SEMESTER (COMMON TO ALL BRANCHES)

L	T	P	C
3	-	-	-

OBJECTIVES:

The main objectives of this course are

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

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 Comparisons

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.

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

14AHS13 TECHNICAL ENGLISH-II

III B.TECH –II SEMESTER (COMMON TO EEE, ECE,CSE & IT)

L	T	C
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 serves 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 been courage 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 One self and Others(Forma land 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 time and Advising

R- Readingfordetails-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, form at s-types-technical reportwriting

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

- **TEXT BOOKS:**

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

2.A Course in Communication Skills-Kiranmai Dutt& co.FoundationBooks,2012.

- **REFERENCE BOOKS:**

1. Raymond Murphy's English Grammar with CD, Murphy, Cambridge University Press,2012.

2. English Conversation Practice–Grant Taylor, Tata Mc-GrawHill,2009.

3. Communication SKILLS, Sanjay Kumar & Pushpa latha Oxford Universityy Press,2012.

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

14AEE26 POWER SEMICONDUCTOR DRIVES **L T C**

III B.TECH –II SEMESTER EEE **3 1 3**

- **OBJECTIVES:**
  1. *To understand the concept of single phase and three phase DC Motor converters and control methods.*
  2. *To acquire the knowledge about closed loop operation of single quadrant, two quadrant and four quadrant chopper drives.*
  3. *To understand the concept of control of Induction motor on stator side using AC voltage controllers and cycloconverters*
  4. *To Know the concept of control of Induction motor from rotor side using different methods*
  5. *To acquire the knowledge about of control of synchronous motor using Inverters and cycloconverters.*

UNIT- I

CONTROL OF DC MOTORS BY SINGLE PHASE & THREE PHASE CONVERTERS: Introduction to Thyristor controlled Drives - Single Phase semi and Fully controlled converters connected to DC separately excited and DC series motors – continuous current operation – output voltage and current waveforms – Speed and Torque expressions – Speed-Torque Characteristics - Problems on Converter fed DC motor- Three phase semi and fully controlled converters connected to DC separately excited and DC series motors – output voltage and current waveforms – Speed and Torque expressions – Speed-Torque characteristics - Four quadrant operation of DC motors by dual converters – Problems.

UNIT- II

CHOPPER CONTROLLED DC DRIVES: Introduction to Four quadrant operation – Motoring operations, Electric Braking, Plugging, Dynamic and Regenerative Braking

operations– Closed loop operation of DC motor (Block Diagram Only)- Single quadrant, Two quadrant and four quadrant chopper fed DC separately excited and series excited motors – Continues current operation – Output voltage and current wave forms – Speed torque expressions – speed torque characteristics – Problems on Chopper fed D.C Motors – Closed Loop operation (Block Diagram Only)

UNIT- III

CONTROL OF INDUCTION MOTOR THROUGH STATOR VOLTAGE & FREQUENCY: Variable voltage characteristics - Control of Induction Motor by AC Voltage Controllers – Waveforms – speed torque characteristics- Variable frequency characteristics - Variable frequency control of induction motor by Voltage source and current source inverter and Cyclo converters - PWM control – Comparison of VSI and CSI operations –

UNIT- IV

CONTROL OF INDUCTION MOTOR FROM ROTOR SIDE: Speed torque characteristics – Numerical Problems on induction motor drives – Closed loop operation of induction motor drives (Block Diagram Only)Static rotor resistance control – Slip power recovery – Static Scherbius drive – Static Kramer Drive, performance and speed torque characteristics – Advantages - Applications – Numerical problems

UNIT- V

CONTROL OF SYNCHRONOUS MOTORS: Separate control & self control of synchronous motors – Operation of self controlled synchronous motors by VSI and CSI cycloconverters - Load commutated CSI fed Synchronous Motor – Operation – Waveforms – speed torque characteristics – Applications – Advantages - Numerical Problems – Closed Loop control operation of synchronous motor drives (Block Diagram Only).

- **TEXT BOOKS:**

1. Dubey.G .K: *Fundamentals of Electric Drives*, Narosa Publications.
2. Rashid.M.H: *Power Electronics - Circuits, Devices and applications*, Pearson Publications.

- **REFERENCE BOOKS:**

1. Singh. M.D and Khanchandani.K.B: *Power Electronics*, Tata McGraw-Hill Publishing company, 1998
2. Bose.B.K: *Modern Power Electronics and AC Drives*, PHI Publishers.
3. Pillai.S.K: *Analysis of Thyristor Power – conditioned motors*, 1st Edition, Universities press.

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

14AEE27 POWER SYSTEM ANALYSIS	**L**	**T**	**C**
III B.TECH –II SEMESTER EEE	**3**	**1**	**3**

14AEE27 POWER SYSTEM ANALYSIS

Objectives:

1. *To study the graph theory, incidence matrices, formation of bus impedance and bus admittance matrices*
2. *To Understand Per unit representation and symmetrical component theory for analyzing different types symmetrical and unsymmetrical faults*
3. *To study the Gauss siedel, Newton Raphson, Decoupled and Fast Decoupled methods for load flow studies and their comparison.*
4. *To Understand the concept of power system stability, Swing equation, Equal area criterion, and methods to improve stability.*

UNIT I POWER SYSTEM NETWORK MATRICES: Representation of power systems elements – graph theory –Incidence matrices - formation of Y_{bus} matrix - direct and singular transformation methods - formation of Z_{bus} matrix - partial network - addition of a branch and link - modification of the impedance matrix for changes in the network - Numerical problems

UNIT II SYMMETRICAL FAULT ANALYSIS: Representation of power systems components - per unit system representation - per unit equivalent reactance network - symmetrical faults analysis - short circuit current and MVA calculation - LLL, LLLG on an unloaded generators - sequence network of synchronous machine - sequence impendence of transformer – Numerical problems

UNIT III UNSYMMETRICAL FAULT ANALYSIS: Symmetrical components of unsymmetrical phasors - phase shift of symmetrical components in star - delta transformer banks - power in terms of symmetrical components - sequence impedance and sequence networks- unsymmetrical faults (LG,LL and LLG) on an unloaded generator - Numerical problems

UNIT IV LOAD FLOW ANALYSIS: Formation of load flow problem - Gauss –siedel method - Newton Raphson method - decoupled and fast decoupled method - comparison of load flow methods -Numerical problems

UNIT V STABILITY ANALYSIS: Elementary concepts of Steady State, Dynamic and Transient Stabilities - Power Angle Curve – Transfer Reactance – Development of Swing Equation – Inertia constant – Steady state stability Transient stability: General considerations and Assumptions – Reduction of Two machine system to one machine system – Equal Area Criterion – Applications of Equal Area Criterion – Critical Clearing Angle - Point by Point solution of Swing equation – Methods of improving steady state and transient stabilities.

Text Books:

1. Stagg El – Abiad & Stags: *Computer Methods in Power Systems*, Mc Graw-hill.
2. Nagrath.I.J & Kothari.D.P: *Modern Power system Analysis*, 3rd edition, TataMcGraw-Hill Publishing Company.
3. William D steveson -: Elements of power system analysis, 4th edition , McGraw-Hill international edition

References:

1. L.P. Singh: *Advanced methods in power system analysis and dynamics*, Wiley Eastern.
2. Hadi Saadat: *Power system Analysis*, TMH, 2002.
3. Grainger and Stevenson: *Power System Analysis*, Tata McGraw Hill.

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

14AEE28 ELECTRIC POWER DISTRIBUTION

III B.TECH –II SEMESTER EEE

L	T	C
3	1	3

Objectives:

1. *To introduce the overall distribution system planning, types of tariffs and load forecasting.*
2. *To study the substation distribution and bus schemes.*
3. *To study the basics of substation protection and automation.*
4. *To study the coordination of protective devices and voltage control.*
5. *To study the importance of compensation for power factor improvement.*

UNIT - I

GENERAL ASPECTS OF DISTRIBUTION SYSTEM: Distribution system- Classification of Distribution Systems-A.C Distribution –D.C Distribution -Types of D.C Distributors-D.C Distribution calculations –A.C Distribution calculations

UNIT - II

DISTRIBUTION SYSTEM PLANNING: Planning and forecasting techniques - load characteristics - Definitions – Load forecasting - Load management – Tariffs - Types of Distribution Transformers - Single phase and Three phase transformers - Y/Δ and Δ/Y connections - Dry type and Self protected type transformers - Regulation and Efficiency.

UNIT - III

SUB STATION DISTRIBUTION AND PROTECTION: Substation location and rating - Primary systems and installation - Bus schemes Sub transmission lines. Voltage drop and power loss calculations - Capacitors in distribution systems - Distribution system protection - - Grounding.

UNIT - IV

COORDINATION AND VOLTAGE CONTROL: Coordination of protective Devices – General Coordination Procedure – Voltage Control – Equipment for voltage control – Effect of Series Capacitors – Effect of AVB/AVR – Line drop compensation.

UNIT- V

COMPENSATION FOR POWER FACTOR IMPROVEMENT: Capacitive Compensation for Power Factor Control – Different types of power capacitors – Shunt and Series capacitors – Effect of shunt capacitors (Fixed and Switched) – Power factor correction – Capacitor allocation – Economic Justification – Procedure to determine the best capacitor location.

Text Books:

1. Turan Gonen: *Electrical Power Distribution System Engineering,* 2nd Edition, CRC Press Publications, 2007.
2. S.Sivanagraju and V.Shankar: *Electrical Power Distribution and Automation,* Dhanapti ray and Co, 2010.
3. *V.K.Mehta: Principles of Power Systems, 2nd Edition, S Chand Publications, 2005.*

References:

1. Pabla A.S: *Electric Power Distribution Systems,* 4th Edition, Tata Mc Graw Hill Publishers, 2006.
2. Sunil S Rao: *Transmission and Distribution,* Khana Publishers, 2011.

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

14AEC28 DIGITAL SIGNAL PROCESSING **L T C**

III B.TECH –II SEMESTER (COMMON TO ECE & EEE) **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 multi rate 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. John G. Proakis & Dimitris G. Manolakis, Digital signal processing, Principles, Algorithms and Applications, Pearson Education/PHI, 4th edition, 2007.
2. Sanjit K. Mitra, Digital Signal Processing, A computer base approach, Tata McGraw Hill, 3rd edition, 2009.

- **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.

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

14ACS12 OBJECT ORIENTED PROGRAMMING THROUGH JAVA	**L**	**T**	**C**
	3	**1**	**3**

III B.TECH –II SEMESTER EEE

Objectives:

The objectives of this course are as follows:

1. To provide students an in-depth theoretical base of the object oriented programming using JAVA.

2. To introduce the students to the programming statements of Java to manage execution flow control.

3. To provide knowledge about the benefits of object oriented programming over Procedure oriented programming.

4. To inculcate knowledge to students to use various concepts like Inheritance, file access techniques, polymorphism and memory management techniques.

UNIT I

OBJECT ORIENTED CONCEPTS: OOP principles-Encapsulation, Inheritance and Polymorphism, Class fundamentals, declaring objects, introducing methods, usage of static with data and methods.

JAVA BASICS: History of Java, Java buzzwords, JVM architecture, data types, variables, scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors, string and String Buffer handling functions.

UNIT II

INHERITANCE AND POLYMORPHISM: Basic concepts, types of inheritance, member access rules, usage of this and super key word, method overloading, method overriding, abstract classes, dynamic method dispatch, usage of final keyword, Garbage Collection.

PACKAGES AND INTERFACES: Defining package, access protection, importing packages, defining and implementing interface, and variables in interface and extending interfaces.

UNIT III

EXCEPTION HANDLING: Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes.

MULTI THREADING: Concepts of thread, thread life cycle, creating threads using thread class and runnable interface, synchronization, thread priorities, inter thread communication.

UNIT IV

AWT CONTROLS: The AWT class hierarchy, user interface components- labels, button, text components, check box, check box groups, choices, list box, panels - scroll pane, menu, scrollbars. Working with frame windows, color, font.

EVENT HANDLING: Events, event sources, event listeners, relationship between event sources and listeners, delegation event model, handling mouse and keyboard events, adapter classes.

UNIT V

SWINGS: Introduction to swings, hierarchy of swing components. Containers, top level containers- JFrame, JWindow, JDialog- JPanel, swing components - JButton, JToggleButton, JCheckBox,JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JTable, JTree, JTabbedPanes, JScrollPane.

APPLETS: Life cycle of an applet, inheritance hierarchy for applets, differences between applets and applications, developing applets, simple applet display methods, passing parameters to applets.

TEXT BOOK:

Herbert schildt, "*The complete reference JAVA"*, 7th edition, Tata Mcgraw Hill, New Delhi, 2010.

REFERENCE BOOKS:

1. T. Budd, "*An Introduction to Object Oriented Programming"*, 3rd edition, Pearson Education, India, 2009.

2. J. Nino, F. A. Hosch, *An Introduction to programming and OO design using Java*, John Wiley & sons, New Jersey,2002.

3. Y. Daniel Liang, *Introduction to Java programming*, 7th edition, Pearson education, India, 2010.

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

14AEC30 BASIC COMMUNICATION SYSTEMS **L T C**

III B.TECH –II SEMESTER EEE **3 1 3**

- **OBJECTIVES:**

The course will provide the student:

1. *To introduce different amplitude modulation and demodulation methods.*
2. *To introduce different frequency modulation and demodulation methods.*
3. *To introduce different analog pulse modulation and demodulation methods and multiplexing.*
4. *To introduce digitization techniques for analog messages and various digital modulation schemes.*
5. *To introduce satellite and optical fiber communications*

UNIT-I

AMPLITUDE MODULATION: Need of modulation – Mathematical representation of AM (AM, DSB SC AM, SSB SC AM, VSB AM) – frequency spectrum- band width – power relation – generation of AM – square law modulator – balanced modulator- generation of SSB-SC AM – Detection of AM - square law detector – Envelope detector – Synchronous detector.

UNIT-II

FREQUENCY MODULATION: Angle modulation – mathematical representation of FM, PM – frequency spectrum – bandwidth- generation of FM –varactor diode modulator, Armstrong modulator - FM detection – foster seeley discriminator – ratio detector.

UNIT-III

ANALOG PULSE MODULATION: Sampling – Sampling of low pass signals, Pulse Amplitude Modulation- Generation and Detection, Pulse Time Modulation Schemes: PWM and

PPM Generation and Detection, Multiplexing – TDM – FDM- Quadrature multiplexing – comparison.

UNIT-IV

DIGITAL MODULATION: Advantages & Disadvantages of digital communication, Elements of digital communication systems, Generation and Reconstruction- Pulse Code Modulation, Delta Modulation.

DIGITAL MODULATION TECHNIQUES: Introduction, Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying.

UNIT-V

SATELLITE AND OPTICAL FIBER COMMUNICATIONS: Orbital satellites, Geostationary satellites, Look angles, Satellite system link models, Satellite system link equations; Advantages & Disadvantages of optical fiber communication, Optical fiber communication system block diagram, Light propagation through an optical fiber, Losses in optical fiber cables, Operation of light emitting diodes and PIN diodes.

- **TEXT BOOKS:**

1. Wayne Tomasi, "Electronic Communication Systems", Pearson Education, 3rd Edition, 2001.
2. A. Bruce Carlson & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.

- **REFERENCE BOOKS:**

1. R.P.Singh & Saphre, "Communication Systems", Tata McGraw Hill Publication, 2009.
2. Dennis Roddy and John Coolen, "Electronic communication", Prentice Hall, 1995.
3. Simon Haykins, "Communication Systems", John Wiely, 1990.

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

14AME58 ROBOTICS **L T C**

III B.TECH –II SEMESTER (COMMON TO EEE, CSE & AE) **3 1 3**

- **OBJECTIVES:**

To make the students learn*:*

1. *The basic concepts of robots.*
2. *The various robot drives and power transmission systems.*
3. *The fundamentals of robot sensors and its vision system.*
4. *The concept of arm kinematics and Programming Languages.*
5. *The applications of robot in various fields.*

UNIT- I

INTRODUCTION TO ROBOTICS: Automation versus Robotic technology, Laws of robot, Progressive advancements in Robots, Robot Anatomy, Classification of robots - coordinate method, control method; Specification of robots. End Effectors: Classification of End effectors – Tools as end effectors, Mechanical-adhesive-vacuum-magnetic-grippers.

UNIT- II

ROBOT ACTUATORS AND MOTION CONVERSION SYSTEMS: Robot Actuators-hydraulic, pneumatic and electric, its comparison, Motion Conversion: Rotary-to-Rotary motion conversion - Gears, Harmonic Drives, Belt-and- pulley systems, Rotary-to-Linear motion conversion- Lead screws, Rack and Pinion systems, cams.

UNIT- III

ROBOTIC SENSORS: Meaning of sensing, selection of sensor for a robot, types of sensors - Position sensors, range sensors, velocity sensors, touch sensors, force and torque sensors. **ROBOT VISION-** Block diagram of vision system, lighting techniques and devices, analog to

digital conversion, Image storage, Image processing and Analysis, Object recognition, Feature extraction.

UNIT- IV

ROBOT ARM KINEMATICS: Homogeneous transformations, Basics of forward kinematics, Inverse kinematics.

ROBOT PROGRAMMING: Requirements of good programming language, Types of Robot programming, Robot programming languages and features- AL, AML, RPL, and VAL.

UNIT- V

ROBOTIC APPLICATIONS: Present applications-Material Transfer, Material handling, loading and unloading, processing, welding, spray painting, Assembly and Inspection; Future applications.

- **TEXT BOOKS:**

1. Richard D. Klafter, Robotics Engineering, Bangalore, New Delhi, Prentice Hall, Eastern Economy Edition, 1989.
2. R.K. Mittal & I.J. Nagrath, Robotics and Control, New Delhi, 3rd Edition, Tata McGraw Hill, 2007.

- **REFERENCE BOOKS:**

1. Ganesh S. Hegde, Industrial Robotics, Lakshmi Publications (P), LTD
2. M.P. Groover, Industrial Robotics, New Delhi, Tata McGraw Hill, 2008.

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

14AHS14 TECHNICAL ENGLISH LAB-II

III B.TECH –II SEMESTER (COMMON TO EEE, ECE, CSE & IT)

L	T	P	C
-	-	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 EL CS 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:

- K-Van Advanced Communication Skills
- TOEFL&GRE (KAPLAN,AARCO&BARRONS,USA, Cracking GRE by CLIFFS)
- *DELTA' s key to the Next Generation TOEFL Test: Advanced Skill Practice.*
- Lingua TOEFLCBT Insider, by Dream tech
- Cambridge Advanced Learners' English Dictionary with CD.
- Oxford AdvancedLearner'sCompass,8thEdition
- SanjayKumar&PushpLata.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.

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

14AEC32 MICROPROCESSORS & MICROCONTROLLERS LAB

III B.TECH –II SEMESTER (COMMON TO ECE AND EEE)

L	T	P	C
-	-	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.

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

14AEE29 COMPREHENSIVE ONLINE EXAMINATION

III B.TECH –II SEMESTER EEE

L	T	P	C
-	-	-	1

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

14AMB01 MANAGEMENT SCIENCE

III B.TECH –II SEMESTER (COMMON TO EEE, ECE, CSE & IT)

L	T	P	C
3	-	-	-

OBJECTIVES:

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 analyse the importance of production in the organisation*

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, 2004.
2. Stoner, Freeman, Gilbert:*Management Science*, 6th Edition, Pearson Education, New Delhi, 2004.

- ## REFERENCE BOOKS:

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

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

14AEE30 RENEWABLE ENERGY SOURCES AND SMART GRID TECHNOLOGY

L	T	C
3	1	3

IV B.TECH –I SEMESTER EEE

- **OBJECTIVES:**
  1. *To understand the Principles of solar radiation and Energy Collection.*
  2. *To acquire the knowledge about direct energy conversion ,solar energy storage and applications*
  3. *To understand the principles of wind and Bio-conversion, methods of biogas digesters and applications.*
  4. *To study the architecture of smart grid and its design features*
  5. *To know the smart grid techniques and concept of micro grid*

UNIT- I

SOLAR RADIATION AND ENERGY COLLECTION: Solar Radiation- The solar energy option, Environmental aspects, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation - sun shine Recorder, solar radiation data. Solar Energy Collectors- Flat plate and concentrating collectors, classification of concentrating collectors.

UNIT- II

SOLAR ENERGY STORAGE AND DIRECT ENERGY CONVERSION: Different methods, Sensible, latent heat and solar ponds, Solar Energy Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion, Direct Energy Conversion- Need for DEC, principles of DEC, Carnot cycle, limitations.

UNIT- III

WIND ENERGY & BIO-MASS: Sources and potentials, power in the wind, horizontal and vertical axis windmills, performance characteristics, Betz coefficient. Generating systems: Constant speed –constant frequency system, Variable speed with constant frequency systems.

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, Factors affecting generation of biogas, Types of Bio-gas digesters, combustion characteristics of bio-gas

UNIT- IV

SMART GRID TECHNOLOGY: Introduction to Smart Grid – Smart Grid Functions – Advantages – Indian Smart Grid – Key Challenges for Smart Grid – Smart Grid Architecture – Components and Architecture of Smart Grid Design.

UNIT -V

SMART GRID TECHNIQUES: Transmission, Distribution and Automation – Computational Intelligence Techniques – Distribution, Generation Technologies – Renewable Energy Technologies – Concept of Micro grids – Control of Smart Grid System – Case Study.

- ## Text Books:

1. Rai.G.D: Non-Conventional Energy Sources, Khanna Publishers
2. Twidell & Wier: Renewable Energy Resources, CRC Press(Taylor & Francis)

- ## REFERENCE BOOKS:

1. Mittal.K, Wheeler: Non-Conventional Energy Systems
2. Kothari.D.P, Singhal.K.C: Renewable energy sources and emerging technologies
3. Gil Masters: Renewable and Efficient Electric Power system,Wilay-IEEE Press,2004

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

14AEE31 UTILIZATION OF ELECTRICAL ENERGY

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**
  1. *To study the laws of illumination and different types of lamps.*
  2. *To study the different types of Electric heating , electric welding and Electrolytic Process.*
  3. *To study the operation of electric drives and their applications.*
  4. *To study the Electric traction system and Electric Braking.*
  5. *To study the speed-time curves, calculation of tractive Efforts etc related to Electric traction.*

UNIT- I

ILLUMINATION: Definition – Laws of illumination – Polar curves – Calculation of Mean Horizontal Candle power(MHCP) and Mean Spherical Candle Power(MSCP)

LAMPS: Incandescent lamp, Sodium Vapour lamp, LED lamp luminars Fluorescent lamp. Requirement of good lighting scheme – Types, Design and Calculation of illumination - Street lighting and Factory lighting – comparison between Sodium Vapour lamp, LED lamp - Numerical Problems.

UNIT- II

ELECTRIC HEATING & WELDING : Advantages - Methods of Electric heating – Resistance, Arc, Induction and Dielectric heating. Types of welding – Resistance, Electric arc, gas welding - Ultrasonic, Welding electrodes of various metals, Defects in welding.

ELECTROLYTIC PROCESS: Electrolysis - Faradays laws, Application of Electrolysis, Power supply for Electrolysis Lead acid batteries.

UNIT-III

ELECTRIC DRIVES: Types of DC and AC Motors and their Characteristics – Applications - Electric Braking - Speed Control of DC and AC Motors – Temperature rise and Load Equalization – Selection of Motors.

UNIT- IV

ELECTRIC TRACTION–I: Introduction – Systems of Electric Traction - Comparison between AC and DC Traction – Special features of Traction Motors - Methods of Electric Braking – Plugging, Rheostatic and Regenerative types -Mechanics of train movement.

UNIT- V

ELECTRIC TRACTION – II: Speed-time curves of different services – trapezoidal and quadrilateral, speed-time curves – Numerical Problems. Calculations of tractive effort, Power, specific energy consumption - effect of varying acceleration and braking retardation - Adhesive weight and coefficient of adhesion – Problems.

- **Text Books:**

1. Partab: *Art & Science of Utilization of electrical Energy*, Dhanpat Rai & Co.
2. J.B.Gupta: *Utilization of Electric Power and Electric traction,* S.K.Kataria & sons

- **REFERENCE BOOKS:**

1. Openshaw Taylor.E and Rao. V.V.L: *Utilization of Electric Energy*, Universities Press.
2. Suryanarayana.N.V: *Utilization of Electrical Power including Electric drives and Electric traction*, New Age International (P) Limited, Publishers, 1996.
3. Uppal.S.L: *Power systems*

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

14AEE32 ADVANCED CONTROL SYSTEMS

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**
  1. *To study the state space analysis which includes canonical forms, solution of state equations, feedback control systems and tests for controllability & observability.*
  2. *To understand the concepts of Non-Linear system and study the analysis of non linear control systems.*
  3. *To study different types of stability for linear and non linear systems.*
  4. *To acquire the knowledge about control variable inequality constraints and minimum principles for minimization of function.*
  5. *To formulate optimal control problems and study different optimal control problems.*

UNIT- I

STATE SPACE ANALYSIS: State Space Representation - Solution of State Equation - State Transition Matrix - Canonical Forms – Controllable Canonical Form - Observable Canonical Form - Jordan Canonical Form - Controllability and Observability -Tests for controllability and observability for continuous time systems – Time varying case - Jordan canonical form - Effect of state feedback on controllability and observability - Design of State Feedback Control through Pole placement - Full order observer and reduced order observer.

UNIT -II

ANALYSIS OF NON-LINEAR SYSTEMS: Introduction to nonlinear systems - Types of nonlinearities - Describing functions - Describing function analysis of nonlinear control systems - Introduction to phase-plane analysis - Method of Isoclines for Constructing Trajectories - singular points - phase-plane analysis of nonlinear control systems.

UNIT- III

STABILITY ANALYSIS: Stability in the sense of Lyapunov - Lyapunov's stability and Lypanov's instability theorems - Direct method of Lypanov for the Linear and Nonlinear continuous time autonomous systems.

UNIT- IV

CALCULUS OF VARIATIONS: Minimization of functionals of single function - Constrained minimization - Minimum principle - Control variable inequality constraints - Control and state variable inequality constraints - Euler Lagrangine Equation.

UNIT -V

OPTIMAL CONTROL: Formulation of optimal control problem - Minimum time, Minimum energy, minimum fuel problems - State regulator problem - Output regulator problem - Tracking problem, Continuous - Time Linear Regulators.

- ## TEXT BOOKS:

1. Gopal.M: *Modern Control System Theory*, 2nd edition, New Age International (P) Ltd, 1996
2. Nagoor Kani: *Advanced Control Systems.*

- ## REFERENCE BOOKS:

1. Ogata.K: *Modern Control Engineering*, 5th edition, Prentice Hall of India, 1998
2. Nagarath.I.J and Gopal.M: *Control Systems Engineering*, New Age International (P) Ltd.
3. Stainslaw H. Zak: *Systems and Control*, Oxford Press, 2003.

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

14ACS15 DATABASE MANAGEMENT SYSTEMS

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**

The objective of this course is to make students to:

1. *Understand the importance of DBMS and explain how DBMS is better than traditional File Processing Systems and analyze the basic structure of Database and recognize the different views of the database.*
2. *Draw and Investigate Data Flow and Entity Relationship Diagrams. & analyze and use Relational Data Model, while comparing with other data models.*
3. *Formulate data retrieval queries in SQL and the Relational Algebra and Calculus.& Describe the semantics of a SQL query in set-theoretic terms.*
4. *Understand terms like Deadlocks, Transaction Processing and Concurrency Control.*
5. *Understand the database storage structures and access the techniques like indexing and hashing.*

UNIT- I

INTRODUCTION: History of database systems- Database system applications - Database system vs file systems - Purpose of Database System – Describing and storing data in a DBMS- Structure of a DBMS.

ENTITY-RELATIONSHIP MODEL (E-R MODEL): E-R Diagrams-Features of ER Model-conceptual Database design with the ER model-conceptual design for large enterprises.

UNIT- II

RELATIONAL MODEL: Introduction to relational model - Integrity constraints -Querying relational data-Logical Database design- Introduction to views- Destroying/Altering Tables and views-Relational Algebra - Relational Calculus.

SQL: The form of a basic SQL query-Union, Intersect and Except operators-Nested queries-Aggregate operators-Null values-Complex integrity constraints in SQL-Triggers and active databases-Designing active databases- Embedded SQL-Triggers – Cursors- Procedures-Functions in PL/SQL.

UNIT- III

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement-Functional Dependencies – reasoning about FDs-Normal Forms: 1NF,2NF,3NF,Boyce-Codd Normal Form-Properties of decompositions-Multi-valued Dependencies and Fourth Normal Form – Join Dependencies and Fifth Normal Form.

UNIT- IV

TRANSACTIONS: Transaction Concepts – Transaction state- Implementation of Atomicity and Durability-concurrent executions– Implementation of Isolation- Serializability- Recoverability.

CONCURRENCY: Concurrency control: Lock based protocols- Time stamp based protocols-Validation based protocols-Multiple granularity-Deadlock handling.

UNIT- V

STORAGE AND FILE STRUCTURE: Overview of Physical Storage Media- Magnetic Disks-RAID-Tertiary storage-Storage Access -File Organization –Organization of Records in Files.

INDEXING AND HASHING: Ordered Indices- B+ Tree Index Files- B- Tree Index Files-Multiple Key Access- Static Hashing- Dynamic Hashing- Comparison of Ordered Indexing and Hashing- Bitmap Indices.

- ## TEXT BOOKS:

1. Ragurama Krishnan, Johannes Gehrke , "*Data base Management Systems"* TATAMcGraw-Hill 3rd Edition,2007.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, *"Database System Concepts"*, Fifth Edition, Tata McGraw Hill, 2006.

- **REFERENCE BOOKS:**

1. Peter Rob,Carlos Coronel, *Database Systems Design Implementationand Management*, 7th edition, 2009.
2. S.K.Singh, "*Database Systems Concepts, Design and Applications*", First edition,Pearson Education, 2006.
3. RamezElmasri, Shamkant B. Navathe, "*Fundamentals of DatabaseSystems*", Fourth Edition, Pearson / Addisionwesley, 2007.

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

14AEE33 POWER SYSTEM OPERATION AND CONTROL

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**
  1. *To understand an overview of economic operation of power system and control.*
  2. *To study the optimal scheduling of hydro thermal system.*
  3. *To understand the modeling of turbine and governor systems.*
  4. *To study the load frequency control, economic dispatch and tie-line bias control.*
  5. *To understand the concepts related to reactive power control and compensation techniques in transmission systems.*

UNIT- I

ECONOMIC OPERATION OF POWER SYSTEMS: Optimal operation of Generators in Thermal Power Stations - Heat rate curve – cost curve – Incremental fuel and Production costs, Input-Output characteristics, Optimum generation allocation with line losses neglected, Optimum generation allocation including the effect of transmission line losses – Loss Coefficients, General transmission line loss formula.

UNIT- II

HYDROTHERMAL SCHEDULING: Optimal scheduling of Hydrothermal System - Hydroelectric power plant models - Scheduling problems - Short term and Long term Hydrothermal scheduling problem.

UNIT- III

MODELING OF TURBINE AND GOVERNOR: Modeling of Turbine - First order Turbine model, Block Diagram representation of Steam Turbines and Approximate Linear Models - Modeling of Governor- Mathematical Modeling of Speed Governing System – Derivation of small signal transfer function – Block Diagram.

UNIT- IV

LOAD FREQUENCY CONTROL: Necessity of keeping frequency constant - Definitions of Control area – Single area control – Block diagram representation of an isolated power system – Steady state analysis – Dynamic response – Uncontrolled case. Proportional plus Integral control of single area and its block diagram representation - steady state response – Load Frequency Control and Economic dispatch control - Load frequency control of two Area system – uncontrolled case and controlled case, tie-line bias control.

UNIT- V

REACTIVE POWER CONTROL: Overview of Reactive Power control – Reactive Power compensation in transmission systems – Advantages and disadvantages of different types of compensating equipment for transmission systems - load compensation – Specifications of load compensator - Uncompensated and compensated transmission lines - shunt and Series Compensation.

- **TEXT BOOKS:**

1. Chakravarthi.A and Halder.S: *Power System Operation and Control*, 3rd Edition, PHI.
2. Nagrath.I.J & Kothari.D.P: *Modern Power System Analysis*, 2nd edition, Tata M Graw – Hill Publishing Company Ltd.

- **REFERENCE BOOKS:**

1. Duncan Glover.J and Sarma.M.S: *Power System Analysis and Design*, 3rd Edition.
2. Nasar.S.A: *Electric Power Systems*, Revised 1st Edition, Schaum's Outline Series TMH.
3. Elgerd.O.I: *Electric Energy Systems*, Mc Graw-hill Edition.

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

14AEE34 HIGH VOLTAGE ENGINEERING

L	T	C
3	1	3

IV B.TECH –I SEMESTER EEE

- **OBJECTIVES:**

1. *To know about the need of generation of high voltages in the laboratory and the industrial applications of high voltage.*
2. *To apply the breakdown phenomena in gases, liquid and solid dielectrics.*
3. *To study the generation of high AC, DC and Impulse voltages.*
4. *To learn the measurement of high AC, DC and Impulse voltages.*
5. *To study the discharge measurements ,methods of discharge detection and high voltage testing methods of power system components.*

UNIT- I

INTRODUCTION: Introduction to HV technology, need for generating high voltages in laboratory, Industrial applications of high voltage, Electrostatic precipitation, separation.

UNIT- II

BREAKDOWN IN GASES, LIQUIDS AND SOLID DIELECTRICS: Gases as insulating media, collision process, Ionization process, Townsend's criteria of breakdown in gases, Paschen's law. Liquid as Insulator, breakdown in pure and commercial liquids. Breakdown of solid dielectrics, Breakdown in composite dielectrics- Intrinsic breakdown, electromechanical breakdown, thermal breakdown, Partial discharge.

UNIT- III

GENERATION OF HIGH AC, DC AND IMPULSE VOLTAGES: Generation of High AC voltages- cascade connection of Transformers- Resonant Transformers - Tesla coil - Generation of High DC voltages Cockcroft - Walton voltage doubler - Calculation of high voltage regulation, ripple and voltage drop.

Generation of Impulse voltage- Introduction to standard lightning and switching impulse voltages – single and Multi stage impulse generator Circuits- Triggering methods of impulse generator circuits- Generation of high impulse current.

UNIT- IV

MEASUREMENT OF HIGH AC, DC AND IMPULSE VOLTAGES: Measurement of High AC voltages-Electrostatic voltmeter- Chubb and Fortescue method - Measurement of High DC voltages- Generating voltmeter- Series resistance micro ammeter - Standard sphere gap measurements of HVAC, HVDC and impulse voltages - Measurement of Impulse voltages- Potential dividers-resistance dividers, capacitance dividers and mixed RC potential dividers - Measurement of high impulse currents - Rogowsky coil.

UNIT- V

HIGH VOLTAGE TESTING TECHNIQUES: Dielectric loss and loss angle measurements using Schering Bridge – Partial discharge measurements – Factors affecting the discharge detection – Methods of Discharge detection – Straight and balanced methods. HV Testing of isolators, circuit breakers, cables, insulators and transformers.

- **TEXT BOOKS:**

1. Naidu.M.S and Kamaraju.V: *High Voltage Engineering*, 4th Edition, TMH Publications
2. C.L.Wadhwa: *High Voltage Engineering*, New Age Internationals (P) Limited, 1997.

- **REFERENCE BOOKS:**

1. Begamudre.R.D: *High Voltage Engineering Problems & Solutions*, First Edition, New Age International Publishers, 2010.
2. Kuffel.E, Zaengl.W.S, Kuffel.J: *High Voltage Engineering: Fundamentals*, 2nd Edition, Elsevier Publications.
3. L.L.Alston " High Voltage Technology", Oxford University Press, New Delhi , First Indian Edition

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

14AEE35 DESIGN OF ELECTRICAL SYSTEMS

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**
  1. *To understand the design aspects of electrical lightning, ventilation, servicing, electric wiring in building.*
  2. *To acquire knowledge in design of industrial installations.*
  3. *To acquire knowledge in improvement of power factor, using compensation techniques and optimal location of capacitor.*
  4. *To study the earthing phenomenon, types of earthing, their characteristics and measurement of earth resistance.*
  5. *To understand power quality issues, resonance problems and energy economics in system design.*

UNIT- I

DESIGN ASPECTS AND INSTALLATIONS OF ELECTRICAL SYSTEMS: Role of Statutes in Electrical System Design - Classification of Building Services - Design Aspects of Lighting - Design Aspects of Ventilation - Design Aspects of Climate Control - Design Aspects of Vertical Transportation - Design Aspects of Minor Building Services. Classification - Estimation of Load Requirements - Selection of Type of Wiring - Special Features Applicable for High -Rise Apartment Buildings - Pre-commissioning Tests.

UNIT-II

INDUSTRIAL INSTALLATIONS: Classification of Industrial Installation - General Characteristics - Selection of Distribution Architecture - Selection of Transformers and Sub Stations. Short Circuit Studies - Fault Current Calculations - Earthing Design - Selection of

Switch Gears - Electrical Protection, Protection of Circuit Elements, Persons & Life stack, Equipment, Electrical Isolation, Switch Gear Control, Switching Devices, Uses, Selective Co-ordination, Circuit Breakers and their Selection.

UNIT- III

POWER FACTOR IMPROVEMENT: Nature of Reactive Energy - Power Factor, How to Improve Power Factor - Economics of Power Factor Improvement - Location of Capacitors - Installation Precautions - Optimal Compensation - PF Correction of Induction Motors - Protection and Control, Voltage Transients, Switching Considerations.

UNIT- VI

POWER SYSTEM EARTHING: Introduction – Earthing - Types of System Earthing - Reasons for Grounding/ Earthing - TN System, TT System, IT System, Protective Measures and Protective Devices in IT System - Main Characteristics of Earthing Systems - Selection Criteria for Earthing - Design Considerations of Earthing - Measurement of Earth Resistance - Earth Leakage Protection - Neutral Earthing for Generators and Transformers.

UNIT-V

POWER QUALITY ISSUES, RESONANCE PROBLEMS AND ENERGY ECONOMICS IN SYSTEMS DESIGN: Power Quality Issues - Harmonics, Sources of Harmonics - Disturbances Caused by Harmonics - Methods to reduce the Impact of Harmonics - Design the Detuned Capacitor Bank - IEEE Standard 519-1992 and Limits. Introduction - Time Value of Money - Single Payment Compound Amount Model (SPCA) - Uniform Series Compound Amount Model (USCA) - Uniform Series Present Worth Model (USPW) - Depreciation, Tax Considerations - After Tax Analysis.

- ## TEXT BOOKS:

1. Giridharan.M.K: *Electrical Systems Design*, I. K. International Publishing House Pvt. Ltd.

2. Er. V. K. Jain and Er.Amitabh Bajaj: *Design of Electrical Installations*, University Science Press.

- **REFERENCE BOOKS:**

1. Turangonen: *Electrical Distribution System*

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

14AEE36 HVDC TRANSMISSION

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**

1. *To understand the concept and planning of HVDC power transmission system.*
2. *To study the analysis of HVDC Converters and their characteristics.*
3. *To study the principle of DC link control, effect of source inductance and reactive power control in the steady state on the systems.*
4. *To study the power flow analysis in AC/DC system converter faults and protection against over voltage and current.*
5. *To study the generation, characteristics and adverse effect of harmonics and design of AC filters.*

UNIT- I

INTRODUCTION TO HVDC TRANSMISSION: Economics & Terminal equipment of HVDC transmission systems - Types of HVDC Links – Apparatus required for HVDC Systems – Comparison of AC & DC Transmission - Application of DC Transmission System – Planning & Modern trends in DC Transmission.

UNIT- II

ANALYSIS OF HVDC CONVERTERS: Choice of Converter configuration – Analysis of Graetz – characteristics of 6 Pulse & 12 Pulse converters – Cases of two 3 phase converters in star – star mode operation and their performance.

UNIT- III

CONVERTER AND HVDC SYSTEM CONTROL AND REACTIVE POWER CONTROL: Principle of DC Link Control – Converters Control Characteristics – Firing angle

control – Current and extinction angle control – Effect of source inductance on the system - Starting and stopping of DC link - Power Control - Reactive Power Requirements in steady state - Sources of reactive power

UNIT- IV

POWER FLOW ANALYSIS IN AC/DC SYSTEMS, CONVERTER FAULT & PROTECTION: Modeling of DC Links - DC Network - DC Converter - Controller Equations - Solution of DC load flow – P.U System for DC quantities - solution of AC-DC Power flow - Simultaneous method - Sequential method - Converter faults – Protection against over current and over voltage in converter station – surge arresters – smoothing reactors – DC breakers

UNIT- V

HARMONICS AND FILTERS: Generation of Harmonics – Characteristics harmonics, calculation of AC Harmonics, Non- Characteristics harmonics, adverse effects of harmonics – Calculation of voltage & Current harmonics – Effect of Pulse number on harmonics.
Types of AC filters - Design of Single tuned filters – Double and High pass filters.

- **TEXT BOOKS:**

1. Padiyar.K.R: *HVDC Power Transmission Systems: Technology and system Interactions,* New Age International (P) Limited, and Publishers.
2. Sunil S.Rao: *EHVAC and HVDC Transmission Engineering and Practice*.

- **REFERENCE BOOKS:**

1. Arrillaga.J: *HVDC Transmission*.
2. Kimbark.E.W: *Direct Current Transmission*, John Wiley & Sons.
3. Collin Adamson & Hingorani N.G " HVDC Power Transmission " Garraway Ltd , London 1960.

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14AEE37 SOFT COMPUTING TECHNIQUES

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**
  1. *To understand the basic concepts of Artificial Neural networks and study the model including applications of ANN.*
  2. *Study the learning strategies of Artificial Neural networks and their training algorithms.*
  3. *To acquire knowledge about associate memory and training algorithms of various associate memory networks.*
  4. *To understand fuzzy logic control and its applications to motor control.*
  5. *To know the basics of genetic algorithm and its application in power system.*

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.

- ## REFERENCE BOOKS:

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.

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14AEE38 ENERGY AUDITING AND DEMAND SIDE MANAGEMENT

IV B.TECH –I SEMESTER EEE

L	T	C
3	1	3

- **OBJECTIVES:**
  1. *To acquire the knowledge about energy auditing and energy conservation.*
  2. *To study the analysis of energy efficient motors for conservation of energy and reduce losses of the motor.*
  3. *Design good lighting system and acquire knowledge of energy instruments.*
  4. *To acquire the knowledge about energy economic analysis such as payback analysis, Depreciation methods etc.*
  5. *To understand the different techniques of demand side management.*

UNIT- I

INTRODUCTION OF ENERGY AUDITING: Introduction-Energy situation in world and India, energy consumption, conservation, Codes, standards and Legislation. - Energy audit- Definitions, concept, types of audit, energy index, cost index, pie charts, Sankey diagrams, load profiles, Energy conservation schemes. Measurements in energy audits, presentation of energy audit results.

UNIT- II

ENERGY EFFICIENT MOTORS: Energy efficient motors- factors affecting efficiency, loss distribution, constructional details, characteristics - variable speed , variable duty cycle systems, RMS hp- voltage variation-voltage unbalance- over motoring- motor energy audit, power factor motor controllers.

UNIT- III

LIGHTING AND ENERGY INSTRUMENTS: Good lighting system design and practice, lighting control ,lighting energy audit - Energy Instruments- wattmeter, data loggers, thermocouples, pyrometers, lux meters, tong testers ,application of Programmable Logic Control(PLC).

UNIT- IV

ENERGY ECONOMIC ANALYSIS: The time value of money concept, developing cash flow models, payback analysis, depreciation, taxes and tax credit – numerical problems.

UNIT- V

DEMAND SIDE MANAGEMENT: Introduction to DSM, concept of DSM, Benefits of DSM, different techniques of DSM – Time of day pricing, Multi-utility power exchange model, time of day models for planning, Load priority technique, peak clipping, peak shifting, valley filling, strategic conservation, energy efficient equipment, Management and Organization of Energy Conservation awareness Programs.

- **TEXT BOOKS:**

1. Arry C. White, Philip S. Schmidt, David R. Brown: *Industrial Energy Management Systems,* Hemisphere Publishing Corporation, New York.
2. Albert Thumann, Englewood Cliffs: *Fundamentals of Energy Engineering,* Prentice Hall Inc, New Jersey.

- **REFERENCE BOOKS:**

1. Paul o' Callaghan: *Energy management,* 1st edition, Mc-graw Hill Book company, 1998
2. Sen.D.P, Padiyar.K.R, Indrane Sen, Pai.M.A: *Recent Advances in Control and Management of Energy Systems*, Interline Publisher, Bangalore, 1993.
3. Ashok V. Desai: *Energy Demand – Analysis*, Management and Conservation, Wiley Eastern, 2005.

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14AEE39 POWER ELECTRONICS & DRIVES LAB

IV B.TECH –I SEMESTER EEE

L	T	P	C
-	-	4	2

- **OBJECTIVES:**
  1. *To determine the characteristics of power semi conductor devices.*
  2. *To understand the different types of firing and commutation circuits for silicon control rectifiers.*
  3. *To know the operation of single phase and three phase converter with R and RL Loads.*
  4. *To obtain the speed control of DC and AC machines using control rectifier.*
  5. *To understand the operation of DC choppers, inverter, cycloconverter and buck boost regulators.*

PART-A:

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

1. Characteristics of SCR, MOSFET & IGBT.
2. Gate firing circuits for SCR's- R, RC and UJT firing circuits.
3. Forced Commutation circuits (Class A, Class B, Class C, and Class D)
4. Single Phase Half wave & controlled rectifier with R & RL load.
5. Single Phase fully controlled bridge converter with R and RL loads.
6. Single Phase AC Voltage Controller with R and RL Loads.
7. Single Phase Cycloconverter with R and RL loads.

PART-B:

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

8. Three phase half and full controlled bridge converter with R & RL loads
9. Closed loop speed control of DC shunt motor using single phase control rectifier
10. Speed control of inverter fed single phase induction motor

11. Buck & Boost converter with R and RL loads.
12. Speed control of single phase Cycloconverter fed induction motor

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14AEE40 ELECTRICAL SYSTEMS AND SIMULATION LAB

IV B.TECH –I SEMESTER EEE

L	T	P	C
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- **OBJECTIVES:**

1. *To acquire knowledge about different types of software like PSPICE, PSIM and MATLAB*
2. *To design electrical circuits, power system control, control system and speed control of electrical machines using PSPICE and MATLAB*
3. *To analysis of electrical parameters using MATLAB editor and mdl file*
4. *To understand the operation of single phase and three phase converter and controller*
5. *To emphasize single and two area control and analysis of three phase circuits in transmission line .*

PART-A:

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

1. PSPICE simulation of DC circuits (Thevenin's equivalent, Transfer function).
2. PSPICE simulation of transient and parameter analysis of RLC circuits to an input i) Pulse ii) Step and iii) sinusoidal signals
3. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system using MATLAB
4. Time domain analysis of second order system-Determination of time domain specifications and steady state error using MATLAB.
5. PSPICE simulation of single phase full converter using RLE loads and single phase AC voltage controller using RLE loads
6. Simulation of Dynamical systems (Single area and Two area power systems) using SIMULINK
7. Simulation of speed control of separately excited dc motor using MATLAB Simulink.

PART-B:

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

8. Simulation of single phase two level PWM inverter.
9. PSPICE Simulation of switch mode regulators
10. Analysis of 3-phase circuit representing the generator transmission line and load. Plotting three phase currents & Neutral current using PSPICE
11. Simulation of Tellegan's & Compensation theorems.
12. Simulation of RL & RC series circuits.

- ## TEXT BOOKS:

1. N. Yadaiah and G. Tulasi ram das: *Simulation tools for Electrical Engineers*, pearson Education

- ## REFERENCE BOOKS:

1. M.H. Rashid: *PSPICE for circuits and Electronics using PSPICE*, PHI publications
2. *MATLAB and its tool boxes user's manual and math works*, USA

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14AMB02 PROFESSIONAL ETHICS

IV B.TECH –I SEMESTER EEE

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- **OBJECTIVES:**
  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.*

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MOOC – I

IV B.TECH –II SEMESTER EEE

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MOOC – II

IV B.TECH –II SEMESTER EEE

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14AEE42	**COMPREHENSIVE VIVA - VOCE**				
IV B.TECH –II SEMESTER EEE		**-**	**-**	**-**	**2**

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14AEE43 PROJECT WORK

IV B.TECH –II SEMESTER EEE

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