w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE

I YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	English – I	3	-	2
2	Mathematics - I	3	-	2
3	Engineering Physics – I	3	-	2
4	Engineering Chemistry I	3	-	2
5	C Programming	3	-	2
6	Mathematical Methods	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	-	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring,)	-	3	2
9	C Programming Lab	-	3	2
10	English Proficiency Lab	-	3	2
	Total			**20**

I YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	English – II	3	-	2
2	Mathematics – II	3	-	2
3	Engineering Physics – II	3	-	2
4	Engineering Chemistry- II	3	-	2
5	Engineering Drawing	3	-	2
6	Environmental Studies	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -II	-	3	2
8	English - Communication Skills Lab	-	3	2
9	IT Workshop	-	3	2
	Total			**18**

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE

II YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Electrical Circuit Analysis-I	4	-	4
2	Fluid Mechanics & Hydraulic Machines	4	-	4
3	Electronic Devices and Circuits	4	-	4
4	Managerial Economics and Financial Analysis	4	-	4
5	Electro Magnetic Fields	4	-	4
6	Electrical Machines-I	4	-	4
7	FM & HM Lab	-	3	2
8	Electronic Devices &Circuits Lab	-	3	2
9	English Communication Practice-I	-	2	1
10	Professional Ethics and Morals-I	2	-	-
	Total			**29**

II YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Electrical Circuit Analysis-II	4	-	4
2	Switching Theory and Logic Design	4	-	4
3	Pulse & Digital Circuits	4	-	4
4	Power Systems-I	4	-	4
5	Electrical Machines-II	4	-	4
6	Control Systems	4	-	4
7	EM-I Lab	-	3	2
8	Electrical Circuits & Simulation Lab	-	3	2
9	English Communication Practice-II	-	2	1
10	Professional Ethics and Morals-II	2	-	-
	Total			**29**

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE

III YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Complex Variables and Statistical Methods	4	-	4
2	Electrical Measurements	4	-	4
3	Power Systems-II	4	-	4
4	Electrical Machines-III	4	-	4
5	Power Electronics	4	-	4
6	Linear & Digital IC Applications	4	-	4
7	Electrical Machines-II Lab	-	3	2
8	Control Systems Lab	-	3	2
9	IPR & Patents-I	2	-	-
	Total			**28**

III YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Electrical Machine Design	4	-	4
2	Microprocessors & Microcontrollers	4	-	4
3	Utilization of Electrical Energy	4	-	4
4	Power System Analysis	4	-	4
5	Power Semiconductor Drives	4	-	4
6	Management Science	4	-	4
7	Power Electronics Lab	-	3	2
8	Electrical Measurements Lab	-	3	2
9	IPR & Patents-II	2	-	-
	Total			**28**

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE STRUCTURE

IV YEAR **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Computer Organization	4	-	4
2	High Voltage Engineering	4	-	4
3	Switch Gear & Protection	4	-	4
4	Power System Operation & Control	4	-	4
5	**Open Elective**	4	-	4
6	**Elective – I**	4	-	4
7	Microprocessors & Microcontrollers Lab	-	3	2
8	Electrical Simulation Lab	-	3	2
	Total			**28**

IV YEAR **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Digital Control Systems	4	-	4
2	**Elective – II**	4	-	4
3	**Elective – III**	4	-	4
4	**Elective – IV**	4	-	4
5	Project	-	-	12
	Total			**28**

Total Credits Obtained: 38+58+56+56 = 208 Credits

Out of 208 Credits a Student who obtains a Minimum of 200 Credits (with the credits of all Laboratories and Project) is Eligible to get Degree.

Open Elective:

1. Energy Audit, Conservation and Management
2. Instrumentation
3. Non Conventional Sources of Energy
4. Optimization Techniques

Elective – I:

1. VLSI Design
2. Electrical Distribution Systems
3. Optimization Techniques

Elective – II:

1. Advanced Control Systems
2. Extra High Voltage Transmission
3. Special Electrical Machines

Elective – III:

1. Non Conventional Sources of Energy
2. Digital Signal Processing
3. FACTS: Flexible Alternating Current Transmission Systems.

Elective-IV:

1. OOPS through Java
2. UNIX and Shell Programming
3. AI techniques

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

COMPLEX VARIABLES AND STATISTICAL METHODS

UNIT-I: Analytic Functions

Functions of a complex variable – Continuity – Differentiability – Analyticity – Properties – Cauchy-Riemann equations in Cartesian and polar coordinates. Harmonic and conjugate harmonic functions – Milne – Thompson method.

UNIT-II: Integration and Series Expansions

Complex integration: Line integral – evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula. Complex power series: Radius of convergence – Expansion in Taylor's series-Maclaurin's series and Laurent series.

UNIT-III: Integration using Residues

Singular point –Isolated singular point – pole of order m – essential singularity. Residue – Evaluation of residue by formula and by Laurent series - Residue theorem. Evaluation of integrals of the type

(a) Improper real integrals $\int_{-\infty}^{\infty} f(x)dx$ (b) $\int_{c}^{c+2\pi} f(\cos\theta, \sin\theta)d\theta$

(c) $\int_{-\infty}^{\infty} e^{imx} f(x)dx$ (d) Integrals by identation.

UNIT-IV : Conformal Mapping

Conformal mapping: Transformation by e^z, lnz, z^2, z^n (n positive integer), Sin z, cos z, z + a/z. Translation, rotation, inversion and bilinear transformation – fixed point – cross ratio – properties – invariance of circles and cross ratio – determination of bilinear transformation mapping 3 given points .

UNIT-V: Statistical Distributions

Conditional Probability – Bayes Theorem, Binomial, Poisson, normal distribution – related properties. Moment generating function.

UNIT-VI: Sampling Distributions

Population and samples. Sampling distribution of mean (with known and unknown variance), proportion, variances. - Sampling distribution of sums and differences. Point and interval estimators for means, variances, proportions.

UNIT-VII: Tests of Hypothesis using Normal Distribution

Statistical Hypothesis – Errors of Type I and Type II errors and calculation. One tail, two-tail tests. Testing hypothesis concerning means, proportions and their differences using Z-test.

UNIT-VIII: Tests of Hypothesis using Non-normal Distributions

Tests of hypothesis using Student's t-test, F-test and χ^2 test.. Test of independence of attributes - ANOVA for one-way and two-way classified data.

Text Books:

1. Engineering Mathematics Volume -III T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
2. Probability and Statistics for Engineers, Miller and John E. Freund, Prentice Hall of India.
3. Higher Engineering Mathematics, B.S.Grewel

References

1. Advanced Engineering Mathematics, Irvin Kreyszig, Wiley India Pvt. Ltd.
2. Probability and statistics by – ATHANASIOS-PAPOULIS-Pearson Edn.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

ELECTRICAL MEASUREMENTS

Objective :
This course introduces principle of operation of basic analog and digital measuring instruments for measurement of current, voltage, power, energy etc. Measurement of resistance, inductance and capacitance by using bridge circuits will be discussed in detail. It is expected that student will be thorough with various measuring techniques that are required for an electrical engineer.

UNIT-I Measuring Instruments
Classification – deflecting, control and damping torques – Ammeters and Voltmeters – PMMC, moving iron type instruments – expression for the deflecting torque and control torque – Errors and compensations.

UNIT –II Instrument transformers and Special Meters
Extension of range using shunts and series resistance -CT and PT: Ratio and phase angle errors – design considerations . Type of P.F. Meters – single phase and three phase dynamometer and moving iron type

UNIT –III Measurement of Power and Energy
Single phase and three phase dynamometer wattmeter, LPF and UPF, expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers – Measurement of active and reactive powers in balanced and unbalanced systems. Single phase induction type energy meter – driving and braking torques – errors and compensations –testing by phantom loading using R.S.S. meter. Three phase energy meter – trivector meter, maximum demand meters.

UNIT – IV Potentiometers
Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance, current, voltage. A.C. Potentiometers: polar and coordinate types - standardization – applications.

UNIT – V Resistance Measurements
Method of measuring low, medium and high resistance – sensitivity of Wheatstone's bridge – Carey Foster's bridge- Kelvin's double bridge for measuring low resistance– loss of charge method for measurement of high resistance.

UNIT –VI A.C. Bridges
Measurement of inductance, Quality Factor - Maxwell's bridge, Hay's bridge, Anderson's bridge, Owen's bridge. Measurement of capacitance and loss angle - Desauty bridge-Wien's bridge – Schering Bridge.

UNIT – V II Magnetic Measurements:
Ballistic galvanometer – equation of motion – flux meter – constructional details. Determination of B-H Loop methods of reversals six point method – A.C. testing – Iron loss of bar samples– core loss measurements by bridges and potentiometers.

UNIT – VIII Digital Meters

Digital Voltmeter-Successive approximation, ramp and integrating type-Digital frequency meter-Digital multimeter-Digital Tachometer

TEXT BOOK:

1. Electrical Measurements and measuring Instruments – by E.W. Golding and F.C. Widdis, fifth Edition, Wheeler Publishing.
2. Electrical & Electronic Measurement & Instruments by A.K.Sawhney Dhanpat Rai & Co.Publications.
3. Modern Electronic Instrumentation and Measurement Techniques – A.D. Helfrick and W.D. Cooper, PHI, 5th Edition, 2002.

REFERENCE BOOKS:

1. Electrical Measurements – by Buckingham and Price, Prentice – Hall
2. Electrical Measurements by Harris.
3. Electrical Measurements: Fundamentals, Concepts, Applications – by Reissland, M.U, New Age International (P) Limited, Publishers.

4 Electrical and Electronic Measurements –by G.K.Banerjee,PHI Learning Private Ltd,New Delhi-2012

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

POWER SYSTEMS-II

Objective :
This course is an extension of power systems-I course. It deals with basic theory of transmission lines modeling and their performance analysis. Transient in power system, improvement of power factor and voltage control are discussed in detail. It is important for the student to understand the mechanical design aspects of transmission lines, cables, insulators. These aspects are also covered in detail in this course.

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 symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems.

UNIT-II Performance of Short and Medium Length Transmission Lines
Classification of Transmission Lines - Short, medium, long line and their model representations -Nominal-T, Nominal-Pie and A, B, C, D Constants for symmetrical & Asymmetrical Networks, Numerical Problems. Mathematical Solutions to estimate regulation and efficiency of all types of lines - Numerical Problems.

UNIT-III Performance of Long Transmission Lines
Long Transmission Line-Rigorous Solution, evaluation of A,B,C,D Constants, Interpretation of the Long
Line Equations, Incident, Reflected and Refracted Waves -Surge Impedance and SIL of Long Lines, Wave Length and Velocity of Propagation of Waves - Representation of Long Lines - Equivalent-T and Equivalent Pie network models (numerical problems).

UNIT – IV 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).

UNIT-V Various Factors Governing the Performance of Transmission line
Skin and Proximity effects - Description and effect on Resistance of Solid Conductors -Ferranti effect - Charging Current - Effect on Regulation of the Transmission Line, Shunt Compensation. Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

UNIT-VI 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-VII Overhead Line Insulators
Types of Insulators, String efficiency and Methods for improvement, Numerical Problems – voltage distribution, calculation of string efficiency, Capacitance grading and Static Shielding.

UNIT-VIII Power Factor Improvement & Voltage Control
Power factor improvement, Voltage Control, introduction to line compensation.

TEXT BOOKS:
1. A Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, U.S.Bhatnagar, A.Chakrabarthy, Dhanpat Rai & Co Pvt. Ltd.
2. Electrical power systems - by C.L.Wadhwa, New Age International (P) Limited, Publishers,1998.

REFERENCE BOOKS:
1. Power system Analysis-by John J Grainger William D Stevenson, TMC Companies, 4th edition
2. Power System Analysis and Design by B.R.Gupta, Wheeler Publishing.
3. Power System Analysis by Hadi Saadat – TMH Edition..
4. Modern Power System Analysis by I.J.Nagaraj and D.P.Kothari, Tata McGraw Hill, 2nd Edition

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

ELECTRICAL MACHINES - III

Objective :

This course is an extension of electrical machines-II. At present, majority of the power plants use synchronous machine as 'ac' generator. It is important to understand the construction, principle of operation, characteristics and operational issues of such machine (synchronous generator). This course covers all these aspects in detail. The issues related to starting and operation of synchronous motors are also covered in this course. It is equally important to study the principle of operation of special machines (viz., single phase induction motor, permanent magnet motor, reluctance motors etc) which are used in several home appliances and electronic gadgets.

UNIT – I Single Phase Motors

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.

UNIT-II Construction and Principle of operation of Synchronous Machines

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.

UNIT – III Synchronous Machine Characteristics

Harmonics in generated e.m.f. – suppression of harmonics – armature reaction - leakage reactance – synchronous reactance and impedance – experimental determination - phasor diagram – load characteristics.

UNIT – IV Voltage Regulation of Synchronous Alternator

Regulation by 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 – V Parallel Operation of Synchronous Alternator

Synchronizing alternators with infinite bus bars – synchronizing power– 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 reactances.

UNIT-VI Synchronous Motors – Introduction

Theory of operation – phasor diagram – Variation of current and power factor with excitation – synchronous condenser – Mathematical analysis for power developed.

UNIT – VII Synchronous Motor Operation and Starting

Excitation and power circles – hunting and its suppression – Methods of starting – synchronous induction motor.

UNIT – VIII Introduction to Special Machines

Principle and performance of A.C. Series motor-Universal motor – Principle of permanent magnet and reluctance motors.

TEXT BOOKS

1. Electric Machines – by I.J.Nagrath & D.P.Kothari, Tata Mc Graw-Hill Publishers, 7th Edition 2005.
2. The Performance and Design of A.C.Machines – by M.G.Say, ELBS and Ptiman & Sons.

REFERENCE BOOKS:

1. Electrical Machines – by P.S. Bimbra, Khanna Publishers.
2. Electric Machinery – by A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw-Hill Companies, 5th
edition, 1990.
3. Theory of Alternating Current Machinery by Langsdorf, Tata Mc Graw-Hill, 2nd edition.
4. Electromachanics-III (Synchronous and single phase machines), S.Kamakashiah, Right Publishers

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

POWER ELECTRONICS

Objective :
The usage of power electronics in day to day life has increased in recent years. It is important for student to understand the fundamental principles behind all these power electronics converters. This course covers characteristics of semi conductor devices, ac/dc, dc/dc, ac/ac and dc/ac converters. The importance of using pulse width modulated techniques to obtain high quality power supply (dc/ac converter) is also discussed in detail in this course.

UNIT – I Power Semi Conductor Devices
Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics – Other thyristors-Basic theory of operation of SCR – Static characteristics – Turn on and turn off methods- Dynamic characteristics of SCR - Turn on and Turn off times - Salient points

UNIT – II Firing and Commutation Circuits of SCR
Two transistor analogy – SCR – UJT firing circuit —– Series and parallel connections of SCR's – Snubber circuit details – Specifications and Ratings of SCR's – Numerical problems – Line Commutation and Forced Commutation circuits.

UNIT – III Single Phase Half Controlled Converters
Phase control technique – Single phase Line commutated converters – Mid point and Bridge connections – Half controlled converters with Resistive, RL loads and RLE load– Derivation of average load voltage and current.

UNIT – IV Single Phase Fully Controlled Converters
Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load– Derivation of average load voltage and current – Line commutated inverters without and with Free wheeling Diode, Effect of source inductance – Derivation of load voltage and current.

UNIT – V Three Phase Line Commutated Converters
Three phase converters – Three pulse and six pulse converters – Mid-point and bridge connections -average load voltage with R and RL loads – Effect of Source inductance–Dual converters (both single phase and three phase).

UNIT – VI AC Voltage Controllers & Cyclo Converters
Single phase AC voltage controllers –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. Cyclo converters – Single phase mid-point cyclo converters with Resistive and inductive load (Principle of operation only) – Bridge configuration of single phase cyclo converter (Principle of operation only).

UNIT – VII DC-DC Convertors

Choppers – Time ratio control and Current limit control strategies – Step down choppers, Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression, High Frequency DC-DC Converter – Buck, Boost, Buck-Boost (Principle of operation only).

UNIT – VIII Inverters

Single Phase and three phase –Basic series inverter, Uni polar, Bi–polar Inverters, PWM Techniques, Sine, Triangular PWM Inverter.

TEXT BOOKS :

1. Power Electronics – by P.S.Bhimbra, Khanna Publishers.
2. Power Electronics : Circuits, Devices and Applications – by M. H. Rashid, Prentice Hall of India, 2nd edition, 1998
3. Power Electronics: converters, applications & design by Nedmohan, Tore M. Undeland, Riobbins by Wiley India Pvt. Ltd.

REFERENCE BOOKS :

1. Power Electronics – by Vedam Subramanyam, New Age International (P) Limited, Publishers
2. Power Electronics - by V.R.Murthy , 1st edition -2005, OXFORD University Press
3. Power Electronics-by P.C.Sen,Tata Mc Graw-Hill Publishing.
4. Thyristorised Power Controllers – by G. K. Dubey, S. R. Doradra, A. Joshi and R. M. K. Sinha, New Age International (P) Limited Publishers, 1996.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

LINEAR & DIGITAL IC APPLICATIONS

UNIT I

INTEGRATED CIRCUITS: Integrated circuits-Types, Classification, Package Types and temperature ranges, Power supplies, Differential Amplifier- DC and AC analysis of Dual input balanced output Configuration, Properties of other differential amplifier configuration (Dual Input Unbalanced Output, Single Ended Input – Balanced/ Unbalanced Output), DC Coupling and Cascade Differential Amplifier Stages, Level translator.

UNIT II

OPERATIONAL AMPLIFIER: Characteristics of OP-Amps, Op-amp Block Diagram, ideal and practical Op-amp specifications, DC and AC characteristics, 741 op-amp & its features, FET input. Op-Amps, Op-Amp parameters & Measurement, Input & Out put Off set voltages & currents, slew rates, CMRR, PSRR, drift, Frequency Compensation technique.

UNIT III

APPLICATIONS OF OP-AMPS: Inverting and Non-inverting amplifier, Integrator and differentiator, Difference amplifier, Instrumentation amplifier, AC amplifier, V to I, I to V converters, Buffers. Comparators, Multivibrators, Triangular and Square wave generators, Log and Anti log amplifiers, Precision rectifiers.

UNIT IV

TIMERS & PHASE LOCKED LOOPS: Introduction to 555 timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger. PLL - introduction, block schematic, principles and description of individual blocks, 565 PLL, Applications of PLL – frequency multiplication, frequency translation, AM, FM & FSK demodulators.

UNIT V

ACTIVE FILTERS: Introduction, 1st order, 2nd order LPF, HPF filters. Band pass, Band reject and all pass filters.

D to A & A to D CONVERTERS : Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, Different types of ADCs - parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC.

UNIT VI

COMBINATIONAL LOGIC DESIGN: Introduction, Design and Analysis procedures, Decoders, encoders, multiplexers and demultiplexers, Code Converters, comparators, adders & sub tractors, Ripple Adder, Binary Parallel Adder, Binary Adder-Subtractor**,** Combinational multipliers, ALU Design considerations of the above combinational logic circuits with relevant Digital ICs.

UNIT VII

SEQUENTIAL LOGIC DESIGN: Introduction, Latches, and flip-flops, Flip-Flop Conversions, Counters, Design of Counters using Digital ICs, Counter applications, Synchronous design methodology, Shift Registers, Modes of Operation of Shift Registers, Ring Counter, Johnson Counter, Design considerations of the above sequential logic circuits with relevant Digital ICs.

UNIT VIII

PROGRAMMABLE LOGIC DEVICES (PLDs): Programmable Read Only Memory, Programmable Logic Array, and Programmable Array Logic Devices, Design considerations of PLDs with relevant Digital ICs.

MEMORIES: ROM: Internal structure, Commercial ROM types, timing and applications,. Static RAM: Internal structure, SRAM timing, standard SRAMS, synchronous SRAMS, Dynamic RAM: Internal structure, timing, synchronous DRAMs.

TEXT BOOKS:

1. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition,2003.
2. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, PHI,1987.
3. Digital IC Applications By Atul P.Godse and Deepali A.Godse, Technical Publications, Pune, 2005.

REFERENCES:

1. Design with Operational Amplifiers & Analog Integrated Circuits - Sergio Franco, McGraw Hill, 1988.
2. Digital Logic and Computer Design By Mano, Pearson Education.
3. Micro Electronics – Millman, McGraw Hill,1988.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

ELECTRICAL MACHINES LAB – II

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

1. O.C. & S.C. Tests on Single phase Transformer
2. Sumpner's test on single phase transformers
3. Scott connection of transformers
4. No-load & Blocked rotor tests on three phase Induction motor
5. Regulation of a three –phase alternator by synchronous impedance & m.m.f. methods
6. V and Inverted V curves of a three—phase synchronous motor.
7. Equivalent Circuit of a single phase induction motor
8. Determination of X_d and X_q of a salient pole synchronous machine

In addition to the above eight experiments, atleast any two of the following experiments are required to be conducted from the following list:

1. Parallel operation of Single phase Transformers
2. Separation of core losses of a single phase transformer
3. Brake test on three phase Induction Motor
4. Regulation of three-phase alternator by Z.P.F. and A.S.A methods
5. Efficiency of a three-phase alternator
6. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers
7. Measurement of sequence impedance of a three-phase alternator.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Electrical and Electronics Engineering – I Sem.

CONTROL SYSTEMS LAB

Any Eight of the following experiments are to be conducted:

1. Time response of Second order system
2. Characteristics of Synchros
3. Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions and application of speed control of motor.
4. Effect of feedback on DC servo motor
5. Effect of P, PD, PI, PID Controller on a second order systems
6. Lag and lead compensation – Magnitude and phase plot
7. Transfer function of DC generator
8. Temperature controller using PID

Any two experiments are to be conducted:-

1. Characteristics of magnetic amplifiers
2. Characteristics of AC servo motor
3. Simulation of Op-Amp based Integrator and Differentiator circuits.
4. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system

REFERENCE BOOKS:

1. Simulation of Electrical and electronics Circuits using PSPICE – by M.H.Rashid, M/s PHI Publications.
2. PSPICE A/D user's manual – Microsim, USA.
3. PSPICE reference guide – Microsim, USA.
4. MATLAB and its Tool Books user's manual and – Mathworks, USA.