WITH EFFECT FROM THE ACADEMIC YEAR 2008-2009

SCHEME OF INSTRUCTION AND EXAMINATION

B.E. IIIrd YEAR

ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER - I

Sl. No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination		
			Periods per Week		Duration in Hrs	Maximum Marks	
			L	D/P		Univ. Exam	Sessionals
		THEORY					
1.	EE 301	Power Systems - I	4	-	3	75	25
2.	EE 302	Electrical Machinery - II	4/1	-	3	75	25
3.	EE 303	Power Electronics	4/1	-	3	75	25
4.	EE 304	Digital Electronics and Logic Design	4	-	3	75	25
5.	EE 305	Linear Integrated Circuits	4	-	3	75	25
6.	EE 306	Linear Control Systems	4/1	-	3	75	25
		PRACTICALS					
1.	EE 331	Electrical Machines Lab-I	-	3	3	50	25
2.	EE 332	Control Systems Lab	-	3	3	50	25
		TOTAL	**24/3**	**6**	**-**	**550**	**200**

EE 301

POWER SYSTEMS - I

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Thermal Power Stations: Choice of site, layout, various parts of the station-Boilers, turbines, super heaters, economizers, air pre-heaters etc. and their functions-Pulverized fuel-Coal handling and ash disposal,gas turbine,combined cycle power plants.

Hydroelectric Power Plants: Estimation of Power-Hydrograph, flow duration curve-Mass curve-Storage, Pondage-Types of Hydroelectric plants and layouts-Prime movers for hydroelectric plants-Specific speed-Choice of prime mover and number of units.

UNIT-II

Nuclear Power Plants: Fissile materials-working principle of nuclear power plant and reactor control-Shielding.

Renewable Energy Sources: Tidal Power, Wind Power: Characteristics of wind power-wind wheels. Solar Energy: Solar power plant - Solar Concentrators-flat plate Collector. Fuel cells, Introduction to hybrid power plants.

UNIT-III

Construction of Overhead lines: Overhead line materials-Supports-Sag and Tension Calculations-effect of wind and ice, errection conditions.

Insulators and Overhead Lines: Types of Insulators-Potential distribution over a string of suspension insulators-Methods of equalizing the potential-testing of insulators.

Insulated Cables: Conductors for cables-Insulating Materials-Mechanical protection-Low voltage cables-Grading of cables-3-phase high voltage cables and super voltage cables. Capacitance of 3-core cables.

UNIT-IV

Inductance and Capacitance of Transmission Lines: Inductance and Capacitance of overhead line conductors-Single phase and three phase with symmetrical composite conductors- GMR and GMD spacings -Transposition-bundled conductors-effect of earth on capacitance.

UNIT-V

Economics of Power Generation: Load curve, load, demand and diversified factors, base load & peak load operation, types of costs and depreciation Fund calculations. Methods of power factor improvement, economics of power factor improvement, tariffs.

Distribution: 2-wire and 3-wire distributors –Ring mains –AC distributions, calculations. Choice of voltage for AC and DC transmission.

Suggested Reading:

1. C.L.Wadhwa-*Electrical Power Systems*-Wiley Eastern Ltd., 4th Edition, 2006.
2. C.L.Wadhwa-*Generation, Distribution and utilization of Electrical Energy*- Wiley Eastern Ltd, 2nd Edition, 2006.
3. S.N.Singh- *Electrical Power Generation, Transmission and Distribution*-Prentice Hall of India Pvt.ltd. New-2003.
4. M.V. Deshpande, *Elements of Electric Power Station Design*, Wheeler Publishers, Third Edition.
5. G D Rai, *Non Conventional Energy Sources,* Khanna Publishers,New Delhi,1999.

EE 302

ELECTRICAL MACHINERY - II

Instruction	4/1	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Parallel operation of Single phase Transformer and load sharing. Insulation of Windings and terminals. Cooling arrangement in Transformers. Testing of Transformers —Routine Tests and Special tests —Measurement of Voltage ratio and check for voltage- vector relationship. Measurement of No- load loss and current. Measurement of Insulation resistance. Maintenance of Transformers.

UNIT-II

Poly-phase Transformer — Connections — Choice of Transformer Connections, Third harmonic voltages — Phase Conversion — 3phase to 2-phase transformation — Scott connection. Constructional features of three-phase transformers, tertiary winding, parallel operation of transformer, Auto Transformer — Comparison with two winding transformers-Conversion of two winding transformer in to auto transformer. Tap changers on transformers-No-load tap changer-on-loac tap changer.

UNIT-III

Three-phase Induction Motor — Constructional features — Rotating Magnetic field theory -- Principle of operation of squirrel cage and slip ring motors — Vector Diagram Equivalent circuit - Expression for torque — Starting torque, Maximum torque — slip/Torque characteristics — Performance characteristics — Equivalent circuits from test — Current loci circle diagram — Predetermination of characteristics of Induction Motors

UNIT-IV

Starting methods of Induction motors .Modes of operation, torque and power limits of Induction motors-Speed control methods — Resistance Control, Voltage control, pole changing, Cascading, variable frequency control- Slip

power recovery schemes Kramer drive. Scherbius drive- Double cage Induction motors. Induction generator

UNIT-V

Unbalanced Operation: Voltage Unbalance - Unbalanced Operation of 3-phase Induction Motor - Per Phase Equivalent Circuits — Single Phasing – Unbalanced Operation of 3-Phase Transformers — Single phase load on Three phase transformers Single Phasing in 3 phase transformers — Delta/ Star and Star/Delta transformers.

Suggested Reading:

1. I.J. Nagarath, D.P.Kothari, *Electrical Machines,* 3rd Edition Tata McGraw Hill, 2004.
2. J.B. Gupta, *Theory and Performance of Electrical Machines*, S.K. Kataria. & Sons, 2003.
3. P.S. Bimbhra, *Generalised theory of Electrical Machines*, Khanna Publishers Fifth Edition 1995
4. M.G.Say, *The performance and Design of A.C. Machines*- Pitman, 1985.
5. Fitzerald A E and Kingzley *"Electrical Machines"* 3rd Edition.

EE 304

DIGITAL ELECTRONICS AND LOGIC DESIGN

(Common to IE & EEE)

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Boolean Algebra and combinational logic -AND,OR and NOT operations-Laws of Boolean Algebra-minimization of Boolean expressions-Truth tables and maps sum of products and product of sums - map method of reduction – incompletely specified functions multiple output minimization

UNIT-II

Tabular minimization -Digital logic families and IC's— Characteristics of Digital IC's, Introduction to RTL, DTL, TTL, CMOS, ECL families, Details of TTL logic family -totem pole, open collector outputs. Wired AND operation, comparison of performance, TTL subfamilies, multiplexer and de-multiplexer, encoder and decoder, code converters, implementation of combinational logic using standard logic gates and multiplexers.

UNIT-III

Binary arithmetic and circuits -Half and Full adder-subtractor and Magnitude comparator, number complements-two's complement arithmetic, carry look ahead adder, decimal numbers and their codes, BCD and Excess-3 arithmetic.

UNIT-IV

Synchronous Sequential Circuits - Basic latch circuit -debouncing switch -SR., JK , D and T flip-flops-truth table and excitation table - ripple and synchronous counters up/down counter -general BCD counter- Counter decoding-shift registers, ring counters.

UNIT-V

Design of Digital Systems - Concept of state. State diagram-design of counters Sequence detector and generators – Design procedure, synthesis

using D, JK, T flip-flops -applications of registers -concepts of programmable, logic - PROM, PLA, PAL.

Suggested Reading:

1. Donald Pleach /Albert Paul Malvino / Goutam saha *"Digital Principles and Applications"* McGraw- Hill, 2006.
2. Tocci & Widmer-*Digital Systems*-Pearson Education-Eigth Edition, 2003.
3. Morris Mano M. - *Digital Design*, Prentice Hall of India, Third Edition, 2002.
4. B. Somnath Nair, *Digital Electronics and Logic Design*, Prentice Hall, India, 2002.

WITH EFFECT FROM THE ACADEMIC YEAR 2008-2009

EE 305

LINEAR INTEGRATED CIRCUITS

(Common to IE & EEE)

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Operational amplifiers -Characteristics, open loop voltage gain, output impedance, input impedance, common mode rejection ratio - Offset balancing techniques -Slew rate, Frequency response – Stability, frequency compensation of Op-amp, basic applications - inverter summer, analog integrator, differentiator, current to voltage converter, voltage to current converter, voltage follower, a-c amplifier.

UNIT-II

Voltage limiter, clipper and clamper, precision rectifier-full wave and half wave, peak detector, comparator, zero crossing detector, Schmitt trigger, monostable, astable, bistable multiplier, divider, difference amplifier instrumentation amplifier circuits using Op-amps.

UNIT-III

Waveform generation using Op-amps- Sine, Square, Triangular and Quadrature oscillators, voltage controlled oscillator / multivibrator, voltage to frequency converter, 555 timer functional diagram, operation as monostable and astable. phase locked loop, A/D and D/A converters.

UNIT-IV

Series voltage regulator using Op-amp- shunt regulators using Op-amp switching regulators using Op-amp -dual voltage regulator - fixed voltage regulators –dual tracking regulators - hybrid regulator- current sensing and current feed back protection.

UNIT-V

RC active filters -low pass - high - band pass - band reject -notch - first order - second order -transformation - state variable filter - switched capacitor filter -universal filter. Balanced modulator/demodulator.

Suggested Reading:

1. D.Roy Choudhury, *Linear Integrated Circuits*, Shail B.Jain, 3rd Edition, New Age International(P) Ltd., 2007.
2. Malvino Albert Paul, *Electronic Principles*, 7th Edition, Tata McGraw Hill, 2006
3. Coughlin and Driscoll, *Operational Amplifiers and Linear integrated Circuits*, 6th Edition, Prentice hall of India 2003.
4. David A. Bell, *Operational Amplifiers and Linear IC's*, PHI, 2003.
5. Gayakwad R.A. *Op-Amps and Linear Integrated Circuits*, 4th Edition, Prentice Hall of India, 2002.

EE 306

LINEAR CONTROL SYSTEMS

(Common to IE & EEE)

Instruction	4/1	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Open and Closed loop Systems-Continuous time and discrete time control systems. Control system components-Error sensing devices-Potentiometers. Synchros, AC-DC servo motors-Block diagram representation, Transfer function and impulse response-Signal flow graphs.

UNIT-II

Time Response: Types of Input, Transient response of second order system for step input. Time diagram specifications - Types of system-static error coefficients, Error Series-Routh-Hurwitz criterion of stability. Root Locus Technique-Typical systems analyzed by root locus technique-Effect of location of roots on system response PID Controller.

UNIT-III

Frequency Response Plots: Bode Plots, Frequency domain specifications. MP, wP for a second order system, Nyquist criterion for a stability, relative stability gain and phase margin, Compensation: Cascade Compensation using Bode plots.

UNIT-IV

State Space Representation: Concept of State, State Variable, State Models of linear time invariant systems. Derivation for state models from transfer functions and differential equations. State Transition matrix-Solution of State equations by time domain method.Observability and Controllability.

UNIT-V

Discrete Control Analysis: The Z-transformation, digital control, advantages and disadvantages. Digital control system architechture.The discrete transfer function. Sample data system. Transfer function of sample data systems-Z-plane specifications of control system design.Z-domain stability.

Suggested Reading:

1. I.J.Nagrath, M.Gopal, *Control System Engineering*, New Age International (P) Limited Publishers, 5th Edition, 2007.
2. M.Gopal, *Control Systems Principles and Design*-Tata McGraw Hill, 2nd Edition, 2003.
3. K.Ogata, *Modern Control Systems*, 3rd Edition.PHI, 2000.
4. J.F.Franklin and J.D.Powell-*Digital Control of Dynamic Systems*, Addison Wesley, 1980.

EE 331

ELECTRICAL MACHINES LAB - I

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

List of Experiments:

1. Magnetization characteristics and the speed Vs voltage curve of separately and self excited D.C. generator
2. Load characteristics of separately excited and Shunt Generators
3. Load characteristics of Compound generator
4. Performance characteristics of Series Motor
5. Performance characteristics of D.C. shunt motor
6. Performance characteristics of Compound motor
7. Separation of iron and friction losses and estimation of parameters in D.C. machines.
8. (a)Speed control of D.C. shunt motor by shunt field control and armature resistance control (b) Swinburn's Test
9. Separation of core losses in a Single Phase transformer
10. Open circuit and short circuit tests on a Single Phase transformer
11. Sumpner's test on two identical transformers
12. Estimation of efficiency of DC Machine by Hopkinson test.

Note: ATLEAST 10 EXPERIMENTS SHOULD BE CONDUCTED IN THE SEMESTER

EE 332

CONTROL SYSTEMS LAB

(Common to IE & EEE)

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

List of Experiments:

1. Characteristics of D.C. and A.C. Servo motors.
2. Characteristics of Synchro Pair.
3. Frequency response of compensating networks.
4. Step response of second order system.
5. D.C.position Control System.
6. A.C.position Control System.
7. Closed loop PPI and PID Controller.
8. Step response and Frequency response of a given plant.
9. Design of lag and lead compensation for the given plant.
10. ON/OFF Temperature Control systems.
11. Temperature control system
12. Level Control system

Note : ATLEAST 10 EXPERIMENTS SHOULD BE CONDUCTED IN THE SEMESTER.

SCHEME OF INSTRUCTION AND EXAMINATION

B.E. IIIrd YEAR

ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER - II

Sl. No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination		
			Periods per Week		Duration in Hrs	Maximum Marks	
			L	D/P		Univ. Exam	Sessionals
		THEORY					
1.	EE 351	Digital Signal Processing	4	-	3	75	25
2.	EE 352	Electrical Machinery - III	4/1	-	3	75	25
3.	EE 353	Power Systems - II	4/1	-	3	75	25
4.	EE 354	Microprocessors & Microcontrollers	4	-	3	75	25
5.	CM 371	Managerial Economics and Accountancy	4	-	3	75	25
		PRACTICALS					
1.	EE 381	Electrical Machines Lab-II	-	3	3	50	25
2.	EE 382	Power Electronics Lab	-	3	3	50	25
3.	EE 383	Integrated Circuits Lab	-	3	3	50	25
4.	EE 384	Industrial Visit	-	-	-	-	*Gr
		TOTAL	20/2	9	-	525	200

*Excellent / Good / Satisfactory / Unsatisfactory

Minimum two visits to the industry.

EE 351

DIGITAL SIGNAL PROCESSING

(Common to IE & EEE)

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT-I

Introduction to Digital Signal Processing: Classification of Signals & Systems. Linear shift invariant systems, stability and causality, Sampling of Continuous signals – Signal Reconstruction, quantizing & encoding, linear constant co-efficient difference equations. Frequency domain representation of discrete time system DTFT & DFT. Applications of DSP

UNIT-II

Fourier Analysis: Distinguishing Fourier transform of discrete singular & discrete Fourier transform, Discrete Fourier series, Phase and amplitude spectra, Properties of Discrete Fourier Transform, Linear Convolution of sequence using DFT, Computation of DFT. Fast Fourier transform: Radix-2 decimation in time and decimation in frequency FFT algorithms, Inverse FFT.

UNIT-III

Z-Transform: Application of Z-Transforms for solution of difference equations of digital filters system function – stability criterion, Realization of filters – direct, canonic. Cascade and parallel form, linear phase realization.

UNIT-IV

IIR Filters: Design of Butterworth Chebyshev filters, IIR filter design by impulse invariant bilinear transformation, impulse invariance method, step invariance method

UNIT-V

FIR Filters: Characteristics of FIR Digital Filters. Frequency response, comparison of FIR, IIR filters – Window techniques, Design of these filters

using – Rectangular, Hamming, Bartlet, Kaiser windows, Architecture and features of TMS & ADSP signal processing chips.

Suggested Reading:

1. P.VenkataRamani, M.Bhaskar, *"Digital Signal Processor, Architecture, Programming & Application"*, TataMcGrawHill-2004
2. Avatar Singh, S.Srinivasan, *"Digital Signal Processing"*, Thomson Publication, 2004.
3. Lafley, *"DSP Processing, fundamentals, architecture & features"*, SChand publishers & Co. 2000
4. Jackson L.B. *Digital Filters and Signal Processing,* Second edition, Kluwer Academic Publishers.1989
5. Oppenheim AV, and Schafer R.W. *Digital Signal Processing* - Prentice Hall Inc. 1975.

EE 352

ELECTRICAL MACHINERY - III

Instruction	4/1	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Synchronous Machines: Constructional Details, Types of windings - Winding factors —e.m.f. equation — Fractional pitch and fractional slot windings — Suppression of harmonics and tooth ripple — Armature reaction and reactance - Synchronous impedance.

UNIT-II

Synchronous Generator: Voltage Regulation — Phasor diagram of alternator with non-salient poles - O.C. and S.C characteristics - Synchronous impedance, Ampere turn, ZPF methods for finding regulation — Principle of two reaction theory and its application for the salient pole synchronous machine analysis — Synchronsing and parallel operation.

UNIT-III

Synchronous Motor: Theory of operation — Vector diagram — Variation of current and p.f. with excitation — Hunting and its prevention — Current and power diagram Predetermination of performance — Methods of Starting and Synchronizing. Synchronising Power. Synchronous Condenser.

UNIT-IV

Transient Stability Studies of Synchronous Machines: Elementary ideas of transient behaviour of an Alternator — Three phase short circuit of an Alternator — Elementary ideas of the stability of synchronous machine connected to infinite Bus. Special Machines - Permanent Magnet Motors, Switched Reluctance Motors, Hysteresis Motors.

UNIT- V

Two phase servo motor characteristics- Single phase motors- Theory and operation of single phase motors-Shaded pole ,Split phase and capacitor

motors – Compensated and uncompensated series and repulsion motors. Linear Induction motors.

Suggested Reading:

1. I.J.Nagrath & D.P. Kothari, *Electrical Machines*, Tata McGraw 2004, 3rd Edition
2. S.K.Bhattacharya, *Electrical Machines*, Tata McGraw Hill, 2002.
3. P.S.Bhimbhra, *Generalized Theory of Electrical Machines*, Fifth Edition, Khanna Publishersl995,
4. M.G Say, *The Performance and Degin of A.C Machines*-Pitman Publications, 1985.

EE 353

POWER SYSTEMS - II

Instruction	4/1	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Transmission Line theory: Short, medium, long lines- Line calculations, Tuned Lines-Power Circle Diagrams and their applications. Corona: Causes-Disruptive and Visual Critical Voltages, Power loss -minimization of Corona effects.

UNIT-II

Voltage Control: Phase Modifiers, Induction Regulators - Tap Changing Transformers, Series and Shunt Capacitance. Reactive Power Requirement Calculations. Static Var Compensators-Thyristor Controlled Reactors-Thyristor Switched Capacitors.

UNIT-III

Per Unit System of Representation: Use of per unit quantities in power systems, Advantages of per unit system. Symmetrical Three Phase transients in R-L series circuits- Short Circuit Currents -Reactances of Synchronous Machines-Symmetrical Fault Calculations. Short circuit capacity of a bus.

UNIT-IV

Unsymmetrical Faults: Symmetrical components of unsymmetrical phasors - Power in terms of symmetrical components - sequence impedance and sequence networks. Sequence networks of unloaded generators - Sequence impedances of circuit elements - Single line to ground, line-to-line and double line to ground faults on unloaded generator- Unsymmetrical faults of power systems.

UNIT-V

Transients in Power Systems: Causes of over voltages. Travelling Wave Theory - Wave equation - Open Circuited Line - The short circuited line - Junction of lines of different natural impedances - Reflection and refraction

Coefficients - Junction of Cable and overhead lines - Junction of three lines of different natural impedances - Bewley Lattice diagram.

Suggested Reading:

1. C.L.Wadhwa, *Electrical Power Systems,* Wiley Eastern Ltd., 4th Edition, 2006.
2. John J. Grainger William D.Stevenson Jr. *Power System Analysis*, Tata McGraw Hill Edn. 2003
3. I.J. Nagrath & D.P.Kothari *"Modern Power Systems Analysis"* TMH Edition, 2003.
4. A.Chakrabarti, M.L.Soni, P.V.Gupta, U.S.Bhatnagar, *A Text book on Power System,* Dhanpat Rai & Co (P) Ltd -1999.

EE 354

MICROPROCESSORS & MICROCONTROLLERS

(Common to IE & EEE)

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT-I

Microprocessor Architecture of 8086 – Segmented memory, Addressing modes, Instruction set, Minimum and Maximum mode operations.

UNIT-II

Assembly language Programming, Assembler directives, simple programs using Assembler, strings, procedures, Macros Timing .

UNIT-III

Memory and I/O interfacing, A/D and D/A interfacing, 8255(PPI) , Programmable Internal Timer(8253), Keyboard and display interface, interrupts of 8086.

UNIT-IV

Microcontrollers- 8051 microcontroller, Architecture, I/O ports, Connecting external memory, Instruction set, Assembly language programming.

UNIT-V

Interrupts, serial I/O, Timers, Counters, Applications of micro controllers- Interfacing LEDs, Seven Segment display, Keyboard Interfacing

Suggested Reading:

1. Douglas.V.Hall – *Microprocessors and Interfacing* – Tata McGraw Hill – Revised 2nd edition, 2006.
2. Krishna Kant – *Microprocessors and Microcontrollers – Architecture, Programming and System Design 8085,8086,8051,8096,* Prentice - Hall India - 2007.
3. Kenneth.J.Ayala -- *"The 8051 Microcontroller Architecture Programming and Applications"*, Thomson publishers, 2nd edition.
4. Walter A. Triebel & Avtar Singh- *The 8088 and 8086 Microprocessor* – Fourth Edition, Pearson.

CM 371

MANAGERIAL ECONOMICS AND ACCOUNTANCY

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

UNIT-I

Introduction to Economics and its evolution - Managerial Economics its scope, importance and relation to other sciences, its usefulness to engineers - Basic concept of Managerial economics.

UNIT-II

Demands Analysis - Concept of demand, determinants, Law of demand, its assumptions, Elasticity of demand, price, income and cross elasticity, Demand Forecasting - Markets Competitive structures, price-output determination under perfect competition and Monopoly. (theory questions and small numerical problems can be asked).

UNIT-III

Theory of Production - Firm and Industry - Production function - input-out relations - laws of returns - internal and external economics of scale. Cost Analysis: Cost concepts - fixed and variable costs - explicit and implicit costs - out of pocket costs and imputed costs - Opportunity cost - Cost output relationship - Break-even analysis. (theory and problems).

UNIT-IV

Capital Management, its significance, determination and estimation of fixed and working capital requirements, sources of capital - Introduction to capital budgeting, methods of payback and discounted cash flow methods with problems.

(Theory questions are numerical problems on estimating working capital requirements and evaluation of capital budgeting opportunities can be asked).

UNIT-V

Book-keeping, principles and significance of double entry book keeping, Journal, Subsidiary books, Ledger accounts Trial Balance concept and preparation of Final Accounts with simple adjustments - Analysis and interpretation of Financial Statements through Ratios.

(theory questions and numerical problems on preparation of final accounts, cash book, petty cash book, bank reconciliation statement, calculation of some ratios).

Suggested Reading:

1. Varshney RL and KL Maheswari, *Managerial Economics*, Sultan Chand.
2. JC Pappas and EF Brigham, *Managerial Economics*.
3. Grawal TS. *Introduction to Accontancy*.
4. Maheswari S.N. *Introduction to Accountancy*.
5. Panday I.M. *Financial Management*.

EE 381

ELECTRICAL MACHINES LAB - II

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

LIST OF EXPERIMENTS:

1. Three phase to Two phase conversion (Scott connection)
2. Heat run test on Three phase transformer.
3. No-load test blocked rotor test and load test on 3-phase Induction motor
4. Speed control of Three phase Induction motor by any three of the following
   a. Cascade connection
   b. Rotor impedance control
   c. Pole changing
   d. Rotor slip recovery — Kramer drive
   e. V/f control
5. Retardation Test/ Dynamic Braking of DC Shunt Motors
6. Performance characteristics of Single phase Induction motor
7. Voltage regulation of Alternator by
   a. Synchronous impedance method
   b. Ampere-turn method
   c. Voltage regulation of Alternator by Z.P.F. Method
8. Regulation of Alternator by slip test
9. Determination of V curves and inverted V curves of synchronous motor
10. Power angle characteristics of a synchronous motor
11. Load characteristics of Induction Generator
12. Two quadrant control of DC drives
13. P.F Improvement of Induction motor using capacitors.

Note: ATLEAST 10 EXPERIMENTS SHOULD BE CONDUCTED IN THE SEMESTER.

WITH EFFECT FROM THE ACADEMIC YEAR 2008-2009

EE 382

POWER ELECTRONICS LAB

(Common to IE & EEE)

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

LIST OF EXPERIMENTS:

I. S.C.R. BJT,MOSFET and IGBT Characteristics

2. Gate triggring circuits for SCR, BJT, MOSFET and IGBT using R, RC, UGT and IC's.

3. Single phase step down cyclo converter with R and RL loads.

4. A.C voltage controllers with R and RL loads

5. Study of forced commutation techniques.

6. Two quadrant D.C drive.

7. Bridge rectifiers – half control and full control with R and RL loads .

8. Simulation of Single Phase Full converter and Semi converter.

9. Simulation of Single Phase & Three Phase Inverter.

10. Buck and Boost choppers

11. Study of 1 kVA UPS and SMPS
    For variable voltage with constant load
    Constant voltage with variable load

12. V/f control of AC drive

Note: ATLEAST 10 EXPERIMENTS SHOULD BE CONDUCTED IN THE SEMESTER.

WITH EFFECT FROM THE ACADEMIC YEAR 2008-2009

EE 383

INTEGRATED CIRCUITS LAB

(Common to IE & EEE)

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

LIST OF EXPERIMENTS:

1. Generation of triangular, sine and square wave using IC's.

2. PLL (Phase locked loop).

3. Design of astable multivibrator using 555 timer.

4. Active filters.

5. Instrumentation amplifier -- Sample and hold circuit.

6. Design of integrator and differentiator using Op-Amp.

7. Multiplexer -- application for logic realization and parallel to serial conversions.

8. Synchronous counters.

9. Asynchronous counters.

10. Clippers and clampers using Op-Amps.

11. Monostable operation using IC's.

12. Boot-strap sweep circuit using Op-Amp.

13. Half adder, full adder and subtractor and realization of combinational logic.

14. A/D converters.

15. D/A convertes.

Note: AT LEAST TEN EXPERIMENTS SHOULD BE CONDUCTED IN THE SEMESTER.

EE 384

INDUSTRIAL VISIT/STUDY

Atleast 3 days in semester	3 x 8 =24 hours
Sessional / Examination	Grade*

Students are expected to visit at least two industries during the semester and submit a detailed technical report on the study – visits to the Department. The Department should evaluate the reports through a Committee consisting of Head of the Department and two more faculty members to award the Grades.

*Excellent /Good /Satisfactory /Unsatisfactory