WITH EFFECT FROM THE ACADEMIC YEAR 2004-2005

SCHEME OF INSTRUCTION & EXAMINATION

B.E III YEAR (REGULAR)

(ELECTRICAL & ELECTRONICS ENGINEERING)

SEMESTER - II

Sl. No.	Syllabus Ref.No	SUBJECT	Scheme of Instructions Periods per Week L/T	D/P	Scheme of Examination Dura-tion in Hrs	Maximum Marks 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	Electrical Machine Design	**4/1**	**-**	**3**	**75**	**25**
4.	EE 354	Microprocessors	**4**	**-**	**3**	**75**	**25**
5.	CM 371	Managerial Economics & 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	IC Lab	**-**	**3**	**3**	**50**	**25**
4.	EE 384	Industrial Visit/Study	**-**	**-**	**-**	**-**	**Gr***
		TOTAL	**20/2**	**9**	**-**	**525**	**200**

*Excellent/Good/Satisfactory/Unsatisfactory
Minimum two visits to the Industries

EE 351

DIGITAL SIGNAL PROCESSING

Instructions	4 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit I

Review of Z transform: Discrete time signals and systems. Linear shifting invariant systems; stability and causality Frequency-domain representation of discrete time systems and signals.

Unit II

The Discrete Fourier Transform: Discrete Fourier series, Discrete Time Fourier, transform. Properties of Discrete Fourier Transform. Linear convolution using Discrete Fourier Transform. Periodic convolution.

Unit III

Computation of the Discrete transform: Fast Fourier transform, decimation-in-time and decimation-in-frequency. FFT algorithms for radix 2 case. In-place computation, bit reversal.

Unit IV

FIR Digital Filter Design Techniques: Properties of FIR Digital Filters Design of FIR filters using windows.

Unit V

Butterworth and Chebvshev approximations: IIR digital filter design techniques. Impulse variant technique. Bilinear transform technique. Digital Butterworth filters. Comparison of FIR and IIR filters.

Suggested Readings:

1. Oppeheim AV and Schafer R.W Digital Signal Processing- Prentice Hall Inc. 1975
2. Jackson L.B Digital Filters and Signal Processing, Second editionl, Kluwer Academic publishers, 1989
3. Porat B. Digital Processing of Random Signals, Prentice Hall, International edition, 1994
4. Chi-T Song Chen, Digital Signal Processing, Oxford University, Press, 2001

EE 352

ELECTRICAL MACHINERY-III

Instructions	4+1 Periods per Week
Duration of University Examination	3 Hours

University Examination	75 Marks
Sessional	25 Marks

Unit I

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.

Unit II

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 III

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

Unit IV

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 V

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, Hyteresis Motors.

Suggested Reading:

1. MG. Say, The Performance and Design of A.C Machines-Pitman Publications, 1985
2. I.J Nagrath & D.P Kothari, Electrical Machines, Tata McGraw Hill, 1995
3. P.S Bhimbhra, Generalized Theory of Electrical Machines, 5th Edition, Khanna Publishers, 1995
4. S.K. Bhattacharya, Electrical Machines, Tata McGraw Hill, 2002

EE 353

ELECTRICAL MACHINE DESIGN

Instructions	4+1 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit – I

Electrical Engineering Materials Insulating Materials: Properties of idea insulating materials classification and types of insulating materials- Conducting Materials-General Properties of copper, Aluminum and Steel, high resistance alloys, Carbon and other conducting materials, super conductors-Magnetic Materials: Classification of magnetic materials, Soft and hard magnetic materials, sheet steel, cold rolled steels solid core and Laminated core materials.

Unit II

Magnetic Circuit: Basic principles, magnetic circuit calculations, flux density in air-gap and tooth-Carters coefficient, ampere turns for gap and teeth, real and apparent flux density, magnetic leakage, armature leakage, leakage flux from salient poles, field distribution curves, field turns, armature reaction ampere turns.

Unit III

Thermal Circuit: Types of enclosures ventilation and cooling methods in electrical machines-losses, temperature rise time curve, cooling curve-Rating of electrical machines, calculation for quantity of cooling medium
Transformer Design-Main dimensions-Output equation-Core design-Cooling system design

Unit IV

DC Machine design: Output equation-main dimensions-Choice of Specific magnetic and electric loading. Selection of number of poles-Choice of Armature core length-Armature diameter-Length of air gap-Armature design-Design of field system

Unit V

AC Machines design: Three Phase Induction Motors: Output equation-Main dimensions-Design of stator and Rotor-Design of Squirrel cage rotor-Design of End rings.
Synchronous Machines: Output equation-Main dimensions-Short Circuit Ratio(SCR)-Length of air gap-Selection of armature slots-Design of Field system-Design of Turbo Alternators.

Suggested Reading:

1. A.K Sawhney, A course in Electrical Machine Design, Dhanpat Rai and Sons, 1996
2. R.K. Agarwal, Principles of Electrical Machines Design, S.K. Kataria & Sons Nai Sarak, New Delhi-6, Fourth edition, 2000.

EE 354

MICROPROCESSORS

Instructions	4+1 Periods per Week
Duration of University Examination	3 Hours
University Examination	75 Marks
Sessional	25 Marks

Unit I
Microprocessor Architecture of 8085- Instruction cycle-Machine cycle-Instruction set and Timing diagrams.

Unit II
8085 Assembly language and Machine code programming-Simple programs, loops, Arithmetic problems-BCD to binary-binary to BCD conversion- Sorting and searching subroutines-delays-counters.

Unit III
Memory interfacing-ROM-SRAM-I/O interfacing-memory mapped I/O and I/O mapped I/O scheme- programmable peripheral chips 8255, 8212, 8155-7 segment LEDs, DAC, ADC – Interfacing

Unit IV
Data transfer schemes-programmed data transfer-Interrupt structure-masking of interrupts-SIM, RIM-interrupt drives-Data transfer-DMA data transfer, programmable interrupt controller 8259-Programmable DMA controller chip(8237)- Serial data transmission-8251-Communication interface.

Unit V
8086 Microprocessor Architecture-Segmented memory-Addressing modes- Instruction set-Simple programs.

Suggested Reading:

1. Rames S. Gaonkar-Micprocessor Architecture, Programming and Applications with the 8085, 8080A, 4th edition – Wiley Eastern Limited
2. Badri Ram- Advanced Microprocessors and Intefacing, Tata McGraw Hill, 2003
3. Walte A Trieble & Avtar Singh-The 8088 & 8086 Micprocessor-Prentice Hall of India Ltd., New Delhi-1995
4. Aditya P. Mathur, Introduction to Microprocessors, 3rd edition, Tata McGraw Hill, 1995

CM- 371

MANAGERIAL ECONOMICS AND ACCOUNTANCY

Instruction	4 Periods per week
Duration of Examination	3 Hours
University Exam.	75 Marks
Sessionals	25 Marks

UNIT –I
Introduction Economics and its evolution – Managerial Economics its scope Importance and relation to other sciences, its usefulness to engineer's 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 – Film and industry, production function, input-output 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 relation ship, bread –even analysis (theory and problems)

UNIT – IV
Capital management its significance, determinates and estimation of fixed and working capital requirements, sources of capital, introduction to capital budgeting, methods with problems.

UNIT – V
Book keeping, principles and significance 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 Maheswar, "Managerial Economics" Sultan Chand.
2. JC Pappas and EP Brigham. "Managerial Economics".
3. Grawal T.S. "Introduction to Accountancy".
4. Meheswar S.N. "Introduction to Accountancy".
5. Panday IM "Financial Management".

EE- 381

ELECTRICAL MACHINES LAB - II

Instruction	3 Periods per week
Duration of Examination	3 Hours
University Exam.	50 Marks
Sessionals	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 impedence method (b) Ampere-turn method

8. Voltage regulation of Alternator by Z.P.F method

9. Regulation of Alternator by slip test

10. Determination of V curves and inverted V curves of synchronous motor

11. Power angle characteristics of a synchronous motor

12. Load characteristics of Induction Generator

13. Static control of eddy current drive

14. Two quadrant control of DC drives

15. P.F Improvement of Induction motor using capacitors

Note: Atleast 10 Experiments should be conducted in the Semester

EE- 382

POWER ELECTRONICS LAB

Instruction	3 Periods per week
Duration of Examination	3 Hours
University Exam.	50 Marks
Sessionals	25 Marks

List of Experiments:

1. S.C.R Characteristics and RC Phase shift trigger Circuit.

2. UJT Oscillator and UJT trigger control.

3. Phase shift trigger pulse generation, zero crossing detection, using op-amp and monostable.
4. Pedestal trigger control for SCR using ICs
5. Study and development of commutation circuits.
6. Bridge rectifiers-half control and full control.
7. DC voltage control using Thyristor chopper circuit
8. Forced commutated inverter
9. Thyristor controlled D.C drive
10. Simulation of Single Phase Full converter and Semi converter using PSPICE
11. Simulation of Three Phase Inverter using PSPICE
12. IGBT and MOSFET based Inverter

Note: ATLEAST 10 EXPERIMENTS SHOULD BE CONDUCTED IN THE SEMESTER

EE- 383

INTEGRATED CIRCUITS LAB

Instruction	3 Periods per week
Duration of Examination	3 Hours
University Exam.	50 Marks
Sessionals	25 Marks

List of Experiments:

1. Generation of triangular and square wave using Op-Amp.
2. PLL(Phase Locked Loop)
3. Design of astable multi vibrator 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 and astable multi vibrators using Op-Amps
12. Bi-stable multi vibrators & Schmitt trigger using Op-Amps.
13. Boot strap sweep circuit using Op-Amp
14. Half adder, full adder and Subtractor and realization of combinational logic
15. A/D converters.

Note: ATLEAST 10 EXPERIMENTS SHOULD BE CONDUCTED IN THE SEMESTER

EE 384
INDUSTRY – VISIT STUDY

Atleast 3 days in Semester 4 x 6 = 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. Department should evaluate the reports through a committee consisting of the Head of the Department and two or more faculty members to award the Grades

* Excellent/Good/Satisfactory/Unsatisfactory