### B.E.MBA integrated in ELECTRICAL & ELECTRONICS
#### VI SEMESTER

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<tr>
<th>Ref No.</th>
<th>Subject</th>
<th>SCHEDULE OF TEACHING</th>
<th>SCHEME OF EXAMINATION</th>
<th>THEOREY</th>
<th>PRACTICAL</th>
<th>Credits</th>
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<td>Computer Aided Power System Analysis</td>
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<td>Microcontrollers, PLCs and Applications</td>
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**Note:**
*marks refer to mid semester evaluation and end semester evaluation.
EE- 601
Computer Aided Power Systems Analysis

External: 50                     L T P
Sessional: 50                  3 1 0
Credits : 4

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part A and two from Part B.

Part-A

1. **Power Flow Studies**

2. **Power System Controls**
Generator-Voltage Control, Turbine-Governor Control, Load-Frequency Control (single area and two area case), Economic Dispatch, Introduction to Optimal Power Flow. 10h

Part- B

3. **Transient Stability Studies**
Introduction of power system stability, The Swing Equation, Simplified Synchronous Machine Model and System Equivalents, Stead state stability, Transient stability, The Equal-Area Criterion for sudden change in mechanical input, sudden loss of one parallel lines, sudden short circuit on one parallel lines and effect of clearing time on stability, Numerical Integration of the Swing Equation, Design Methods for Improving Transient Stability. 18 h

4. **Facts Devices**
FACTS Technology, objectives, types of controllers, FACTS Devices: STATCOM, SSG, SVG, UPFC and SSSC. 4h

Text Book

Other Recommended Books
EE651
Computer Aided Power Systems
Analysis Laboratory
Marks: 50         L T P
Credits : 2                0 0 3

Note: At least four design / analysis projects relating to the following.
1. Power flow analysis.
2. Power flow control
3. Economic dispatch
4. Transient stability studies.
5. Load frequency control
6. FACTS controller

EE602
Microcontroller, PLCs and Applications
External: 50         L T P
Sessional: 50         3 1 0
Credits : 4

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part A and two from Part B.

Part-A
Introduction: Micro controller, Comparison of Microprocessor and Micro controller, micro controller and embedded processors. 2 h
The 8051 Architecture: 8051 Micro controller hardware, Input/Output Pins, Ports, and Circuits, External memory, Counter & timers, Serial Data Input/Output, Interrupts 6 h
8051 Assembly Language Programming: Introduction to 8051 Assembly programming, Assembling and running an 8051 program. Data Types and directives. Addressing modes and accessing memory using various addressing modes. Arithmetic instructions and programs, Logic instructions and programs, Single bit instructions and programming, Jump loop and call instructions, I/O Port programming, Timer/counter programming in the 8051 8 h
Serial Communication: 8051 connection to RS 232, 8051 serial communication Programming. 3 h

Part-B
Real World Interfacing: LCD, ADC and sensors, Stepper motor, keyboard, DAC and external memory 7 h
Ladder Diagram Fundamentals :Basic Components and their symbols, Fundamentals of Ladder Diagrams, Machine Control Terminology 4 h
Introduction to PLC: Brief History ,PLC configurations , System Block Diagram, Update - solve the ladder-update 4 h
Fundamental PLC programming: Introduction, Physical components, Program
Components, Internal Relays, Disagreement Circuit, Majority Circuit, Oscillator, Holding Contacts, Always on and always off contacts, Ladder Diagrams having more than one rung 6 h

**Mnemonic Programming Code:** AND Ladder Rung, Entering Normally closed contacts, OR Ladder Rung, Simple Branches, Complex Branches 5 h

**Text Books:****
- The 8051 Microcontroller and embedded Systems by: - Ali Mazidi
- Programmable Logic Controllers by John Hackworth & Frederick Hackworth

**Recommended Books:**
- The 8051 Microcontroller Architecture, Programming & application by Ayala
- Programmable logic controllers Principles & applications, John W. Webb, Prentice Hall

## EE-652
Micro Controller, PLCs and Applications Lab

Marks: 50  
Credits : 2  
L T P 0 0 3

**List of Experiments:**

**Note:** At least eight experiments to be done selecting at least two from the last experiment.

1. Study of 8051/8031 Micro controller kits.
2. Write a program to add two numbers lying at two memory locations and display the result.
3. Write a program for multiplication of two numbers lying at memory location and display the result.
4. Write a program to check a number for being ODD or EVEN and show the result on display.
5. Write a program to split a byte in two nibbles and show the two nibbles on display.
6. Write a Program to arrange 10 numbers stored in memory location in Ascending and Descending order.
7. Write a program to find a factorial of a given number.
8. Write a program of Flashing LED connected to port 1 of the Micro Controller
9. Write a program to generate a Ramp waveform using DAC with micro controller.
10. Write a program to interface the ADC.
11. Write a program to control a stepper motor in direction, speed and number of steps.

Write Ladder programs (at least two) using PLC for control of simple industrial Processes.
EE-603
Digital Signal Processing

External: 50         L T P
Sessional: 50       3 1 0
Credits : 4

Course duration: 45 lecturers of one hour duration each
Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part A and two from Part B.

PART A

CONTINUOUS TIME SIGNALS
Review of Fourier series and Fourier Transform, Sampling of Continuous Time signals.

DISCRETE TIME SIGNALS
Discrete time Signals & Systems, Linear Time Invariant systems, Stability and Causality, Solution of Linear constant coefficient difference equations, Convolution, Correlation, Z- Transform and its properties, Inverse Z transform.

FREQUENCY DOMAIN REPRESENTATION OF SIGNALS & SYSTEMS

PART B

DIGITAL FILTERS
Ideal Filter vs. Practical Filters, General Specifications and Design Steps, Comparison of FIR & IIR Filters.
Design of FIR Filters: Window technique, Frequency sampling technique.
Design of IIR Filters: Impulse Invariance technique, Bilinear Transformation, Design of IIR Filters using Butterworth, Chebyshev and Elliptic filter, Digital frequency transformation.

IMPLEMENTATION OF DISCRETE TIME SYSTEMS
Block diagrams and signal flow graphs for FIR and IIR systems. Direct form, Cascade and Frequency Sampling Structures for FIR systems, Direct forms, Cascade and Parallel form realization of IIR systems, Finite Word Length Effects.

DSP PROCESSORS
Introduction to fixed point and floating point processors and their architecture, TMS320C5X Architecture, Memory, Addressing Modes, Interrupts and Assembly Language Programming.

Recommended Books:
2. “Digital Signal Processing” by E C Ifeacher and B W Jervis
EE-653  
Digital Signal Processing Lab

Marks: 50  
Credits: 2  
L T P: 0 0 3

List of Experiments:

**Note:** At least eight experiments to be done.

1. Generating & Plotting Discrete time signals using MATLAB.
2. Use of basic multi-signal processing signals of MATLAB.
3. To perform different operations - addition, multiplication, scaling, folding, and shifting using MATLAB.
4. Convolution of Causal & Non Causal sequences in MATLAB.
5. Auto & Cross-Correlation in MATLAB.
7. DFT & IDFT of two sequences.
8. FFT of two Sequences.
9. FIR Filter Design using Window Method in MATLAB.
10. IIR Filter Design using Bilinear Transformation in MATLAB.
11. IIR Filter Design using Impulse Invariance in MATLAB.
12. Butterworth and Chebyshev Digital IIR Filters in MATLAB.
13. Implementation of Filter Structures in MATLAB.
15. System Design based on DSP kits.
EE605
COMPUTER NETWORKS

External: 50   L T P
Sessional: 50  3 1 0
Credits : 4

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part A and two from Part B.

Part-A

Introduction (6)
Data Transmission concepts; switching; Modulation; multiplexing; Network Hardware: LAN, MAN, WAN, Wireless Networks, Internet works; Network Software: Layer, Protocols, interfaces and services; Reference Model: OSI, TCP/IP and their comparison.

Physical Layer (10)

Data Link Layer (10)
Framing; Error control; Error Correction & Error Detection; Sliding window protocols; Examples of DLL Protocols – HDLC,SLIP, PPP ; Medium Access Sub Layer: Channel Allocation, MAC protocols – ALOHA,CSMA protocols, Collision free protocols, Limited Contention Protocols, Wireless Protocols, IEEE 802.3,802.4,802.5 standards and their comparison. Bridges: Transparent, source routing, remote.

Part-B

Network Layer (8)
Design issues, routing algorithms (shortest path, flooding, flow based, distance vector, hierarchical, broadcast, multicast, for mobile host). Introduction to Congestion control algorithms.

Transport Layer (5)
Addressing, establishing and releasing connection, flow control & buffering, multiplexing, crash recovery, Internet Transport protocol (TCP and UDP).

Application Layer (6)
Basics of Network security, Domain Name System, Introduction of Simple Network Management Protocol, Electronic mail and FTP.

Text Books
1. Computer Networks Andrew S. Tanenbaum (PHI)
2. Data Communications and Networking, 3/e Behrouz A Forouzan (Mcgraw-hill)

Other Recommended Books
1. Data and Communication William Stallings (PHI)
2. Data & Computer Communication Douglas E. Coomer (Addison Wessl)
MANAGERIAL ECONOMICS
Course : BE-MBA VI th Semester

Paper – Compulsory

Paper Code: IBM-601

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Internal Assessment: 50

External Assessment: 50

Credits :3

Part-A

Introduction to Managerial Economics and Demand Concepts: Nature Scope and Importance of Managerial Economics, opportunity costs, incremental principle, time perspective, Equi marginal principles, Individual Demand, Market Demand, Kinds of Demand, Determinants of Demand, Demand Functions and Law of Demand, Income and Price elasticity of demand, substitution effect.


Production Function: Concept and types, Returns to Factor and Returns to Scale, Law of Variable Proportions, law of diminishing marginal returns.

Cost concepts and Analysis: Concept of Cost, Short run and Long-run Cost Curves, Relationships among various costs.

Revenue Curves: Concept and Types.

Part B

Perfect Competition: Characteristics, Equilibrium Price, Profit Maximizing output in Short Run and Long Run, Price Discrimination; Imperfect Competition, Monopolistic Competition, Oligopoly and Barriers to Entry.

Economic Environment of Business- Meaning of GDP, Monetary and Fiscal Policy, Deficit Financing, Inflation, Subsidies, Devaluation of Rupee, Liberalization, Privatization and Disinvestment.

References:

1. Managerial Economics, Mote, Paul Gupta, Vikas Publisher, New Delhi
3. Microeconomics, Robert. Pindyck, Daniel Rubinfield, Pearson
CORPORATE LEGAL ENVIRONMENT

Course : BE-MBA VI th Semester
Paper – Compulsory

Paper Code: IBM- 602

Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note: Examiner shall set eight questions, four from Part-A and four from Part-B of the syllabus. Candidate will be required to attempt any five questions selecting at least two questions from Part-A and two from Part-B.

Internal Assessment: 50  External Assessment: 50  Credits :3

Part A

The Contract Act 1872 : Introduction: Meaning of contract; Types of contract; Essential elements of a valid contract. Offer: Meaning and Definition of offer; Types; Rules regarding offer; Revocation of offer; Lapse of offer.

Acceptance: Meaning and Definition of acceptance; Rules regarding acceptance; Revocation of acceptance.

Consideration: Definition; Types; Rules; Exceptions

Capacity of Parties: Position of Minor, Person of unsound mind, Persons disqualified by law.

Free consent; Discharge of contract, Remedies for Breach of contract, Contract of Indemnity, Contract of Guarantee

Sales of Goods Act 1930 : Meaning; Difference between Sale of Goods and Agreement to Sale, Essentials of Contract of Sale; Difference between Contract of Sale and Hire-Purchase Agreements; Conditions and Warranties; Transfer of property or ownership; Performance of Contract of Sale; Rights of Unpaid Seller; Auction Sale.

The Companies Act, 1956 : Definition; Meaning; Features; Types of companies; Incorporation of a company; Memorandum of Association; Articles of Association and Prospectus; Doctrine of Indoor Management; Lifting of Corporate Veil; Registration and Incorporation of a company; Doctrine of Ultravires Transactions; Winding up of company.

Part B


Information Technology Act-2000 : Objective of the act, documents excluded from the scope of the act, digital signatures, types of digital signatures in India, certifying authorities in India, regulation of certifying authorities, duties of subscribers, offences, appellate tribunal, penalties and adjudication

References:
2. An Introduction to Mercantile Laws- N.D. Kapoor, Sultan Chand & Sons