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

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Subject</th>
<th>SCHEDULE OF TEACHING</th>
<th>SCHEME OF EXAMINATION</th>
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<td>L  T  P  Total</td>
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<tr>
<td>EE-601</td>
<td>Computer Aided Power System Analysis</td>
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<td>50 50 3 100</td>
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<td>EE-651</td>
<td>Computer Aided Power System Analysis Lab</td>
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<tr>
<td>EE-602</td>
<td>Microcontrollers, PLCs and Applications</td>
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<td>50 50 3 100</td>
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<td>EE-604</td>
<td>Electronics Systems Design</td>
<td>3  1  -  4</td>
<td>50 50 3 100</td>
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<td>EE-654</td>
<td>Electronics Systems Design Lab</td>
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<td>EE-606</td>
<td>Power Electronics and Drives</td>
<td>3  1  -  4</td>
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<td>EE-656</td>
<td>Power Electronics and Drives (Lab)</td>
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<td>Managerial Economics</td>
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<td>IBM602</td>
<td>Corporate Legal Environment</td>
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<td><strong>Total</strong></td>
<td><strong>18  4  12  34</strong></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 for Examiner- Examiner will set 7 questions of equal marks. First question will cover whole syllabus, having 5 conceptual questions of 2 marks each and is compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART-A

1. **Per Unit System**
   Introduction to per unit system, per unit impedances in single phase transformer circuits, three phase transformers, three winding transformers, advantages of per unit system, Introduction to Per unit system.
   (5-hours)

2. **Power Flow Studies**
   (7-hours)

3. **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.
   (6-hours)

4. **Transient Stability Studies**
   (8-hours)

PART B

5. **Symmetrical Faults**
   (6-hours)

6. **Symmetrical Components**
   Definition of Symmetrical Components, Sequence Networks of Impedance Loads, Sequence Networks of Series Impedances, Sequence Networks of Three-Phase Lines,
Sequence Networks of Rotating Machines, Per-Unit Sequence Models of Three-Phase Two-Winding Transformers, Per-Unit Sequence Models of Three-Phase Three-Winding Transformers, Power in Sequence Networks

(6-hours)

7. **Unsymmetrical Faults**

(6-hours)

**TEXT BOOKS RECOMMENDED**

**OTHER RECOMMENDED BOOKS**

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**EE-651**

Computer Aided Power Systems
Analysis Laboratory

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

**Note:** At least five design / analysis projects relating to Sr. No 4-10 can be performed while Sr. No. 1-3 are compulsory.

1. Introduction to MATLAB Software
2. Formulation of \( Y_{bus} \) using MATLAB Software
3. Formulation of \( Z_{bus} \) for a system using step-step algorithm using MATLAB Software
4. Symmetrical Fault analysis
5. Unsymmetrical Fault analysis
6. Power flow analysis.
7. Power flow control
8. Economic dispatch
10. Load frequency control

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**EE602**

Microcontroller, PLCs and Applications

| External: 50 | L T P |
| Sessional: 50 | 3 1 0 |
| Credits: 4 |
Note for Examiner- Examiner will set 7 questions of equal marks. First question will cover whole syllabus, having 5 conceptual questions of 2 marks each and is compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART-A

1. Introduction
   Micro controller, Comparison of Microprocessor and Micro controller, micro controller and embedded processors. (6-hours)

2. The 8051 Architecture
   8051 Micro controller hardware, Input/Output Pins, Ports, and Circuits, External memory, Counter & timers, Serial Data Input/Output, Interrupts. (6-hours)

3. 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 (6-hours)

4. Serial Communication
   8051 connection to RS 232, 8051 serial communication Programming. (6-hours)

PART B

5. Real World Interfacing
   LCD, ADC and sensors, Stepper motor, keyboard, DAC and external memory (6-hours)

6. Ladder Diagram Fundamentals
   Basic Components and their symbols, Fundamentals of Ladder Diagrams, Machine Control Terminology (6-hours)

7. Introduction to PLC
   Brief History, PLC configurations, System Block Diagram, Update - solve the ladder-update (6-hours)

8. 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-hours)

9. Mnemonic Programming Code
   AND Ladder Rung, Entering Normally closed contacts, OR Ladder Rung, Simple Branches, Complex Branches.
TEXT BOOKS
2. John Hackworth & Frederick Hackworth, Programmable Logic Controllers

OTHER RECOMMENDED BOOKS
1. Ayala, The 8051 Microcontroller Architecture, Programming & application
2. John W. Webb, Programmable logic controllers Principles & applications, , Prentice

EE-652
Micro Controller, PLCs and Applications Lab

Marks: 50
Credits: 2

L T P: 0 0 3

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-604
Electronics Systems Design

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

Course duration: 45 lecturers of one hour duration each

Note for Examiner- Examiner will set 7 questions of equal marks. First question will cover whole syllabus, having 5 conceptual questions of 2 marks each and is compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

PART-A

1. Combinational Circuits
   Error Correction and Detection: Error detection and correction techniques, Single error detection, Single error correction with double error.
   Fault detection and Location in combinational circuits: Different methods of detecting and locating Faults in combinational circuits.

   (20-hours)

PART-B

2. Sequential Circuits
   Synchronous circuits: Concept of state diagram and state table, state assignment, state reduction, Analysis and synthesis of sequential circuits.
   Fault detection and Location in sequential circuits.

   (25-hours)

TEXT BOOKS
1. Digital circuits and Logic Design By Lee, PHI.
2. Switching and Finite Automata Theory by Kohavi, TMH.

OTHER RECOMMENDED BOOKS
1. Computer Logic Design, Morris Mano, PHI.
2. Switching circuits for Engineers, Marcus, PHI.
3. Introduction to Digital systems, James Palmier, David Perlman.

**EE-654**

**Electronics Systems Design Lab**

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**Note:** At least eight experiments are to be performed.
1. Design of an Instrumentation Amplifier.
2. Design of an AC/DC voltage regulator using SCR.
3. Design of process control timer.
4. Design of wireless data modem.
5. Microcontroller based systems design.
6. Design of AM modulator and demodulator.
7. Design of FM modulator and demodulator.
8. Design a sequence detector to detect a given sequence.
9. Arithmetic logic unit design.
10. DSP based system design.

**EE-606**

**Power Electronics & Drives**

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**Note for Examiner:** Examiner will set 7 questions of equal marks. First question will cover whole syllabus, having 5 conceptual questions of 2 marks each and is compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

**PART-A**

1. **AC Voltage Controllers**
   
   ON-OFF control – phase control – 1-phase full wave – analysis with R & RL load – input PF, two stage sequence control with R & RL load – 3-phase full-wave controller with R load, 3-phase bidirectional delta connected controllers

   (8 hours)

2. **Inverters**

   1-phase half bridge and full bridge – HF, THD, DF, 3-phase inverter - 180° and 120° conduction, Analysis with R & RL load, PWM techniques – single pulse, multiple pulse & sinusoidal pulse width modulation, modulation index, voltage control of 3-phase inverters, sine PWM, harmonic reduction, bipolar & unipolar modulation, current source inverter, Series and parallel inverters, Mc-Murray Bedford inverters.

   (12 hours)

3. **Multi Level Inverters**

   Multilevel concept – diode clamped – flying capacitor – cascade type multilevel inverters

   (5 hours)
PART-B

4. **Cycloconverters**
   Principle of operation, Single phase and Three-phase Dual converters, Single phase and three phase cyclo-converters, power factor Control, Introduction to matrix converters, Advantages disadvantages of cycloconverter

(08 hours)

5. **Electric Drives**

(12 hours)

**TEXT BOOKS RECOMMENDED**

**OTHER RECOMMENDED BOOKS**


**EE-656**

**Power Electronics & Drives**

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

**Note:** At least eight experiments are to be performed selecting at least three from experiment 7.

2. Speed control of induction motor using thyristor.
4. Study of mc murray half-bridge inverters and check their performance
5. Study of the microprocessor based firing control of a bridge converter.
6. To design and simulate the ac controller and analyze the results
7. Design and simulation of following thyristor circuits using pscad / matlab software.
   a) Inverter circuits
   b) Dc-dc drive
   c) Dc-ac drive

MANAGERIAL ECONOMICS
Course : BE-MBA VI th Semester
Paper – Compulsory
Paper Code: IBM- 601
Course Duration: 45 Lectures of one hour each.

Note for Examiner- Examiner will set 7 questions of equal marks. First question will cover whole syllabus, having 5 conceptual questions of 2 marks each and is compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

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 Lung-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 Rubinfeld, Pearson

CORPORATE LEGAL ENVIRONMENT

Course: BE-MBA VIth Semester

Paper – Compulsory

Paper Code: IBM- 602  Time: 3 Hours

Course Duration: 45 Lectures of one hour each.

Note for Examiner- Examiner will set 7 questions of equal marks. First question will cover whole syllabus, having 5 conceptual questions of 2 marks each and is compulsory. Rest of the paper will be divided into two parts having three questions each and the candidate is required to attempt at least two questions from each part.

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

The Consumer Protection Act, 1986: Definitions of Consumer, Person, Goods, Service, Trader; Manufacturer-Meaning of Consumer Dispute; Complaint-Unfair Trade Practices-
Restrictive Trade Practices, Consumer Protection Councils; Consumer Disputes Redressal Agencies.

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