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

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Subject</th>
<th>SCHEDULE OF TEACHING</th>
<th>SCHEME OF EXAMINATION</th>
<th>CREDITS</th>
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<td>EE-703</td>
<td>Power Plant Engineering</td>
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<td>EE-708</td>
<td>Digital Signal Processing</td>
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<td>EE-758</td>
<td>Digital Signal Processing Lab</td>
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<td>EE-709</td>
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<td>Statistics &amp; Research Methodology</td>
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### Elective-I

(i) **Optical Communication**

(ii) **Wireless Communication**
EE-703

POWER PLANT ENGINEERING

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
Energy resources and their availability, types of power plants, selection of the plants, review of basic thermodynamic cycles used in power plants.

Thermal Power Plants
Flow sheet and working of modern-thermal power plants, Site selection, Power plant boilers including critical and super critical boilers, Boilers mountings and accessories, Different systems such as coal handling system, Pulverizers and coal burners, Combustion system, Draft, Ash handling system, Dust collection-mechanical dust collector and electrostatic precipitator system, Feed water treatment and condenser and cooling towers and cooling ponds, Prospectus and development of thermal plants in India.

Diesel Power Plant
Outline of diesel power plant, Systems of diesel power plant like air intake system, Fuel system, Cooling system, Exhaust system, lubrication system, Engine starting and stopping system, Diesel plant operation and efficiency, Comparative study of diesel power plant with steam power plant.

Part-B

Gas turbine
Classification, Open and closed cycle, Actual Brayton cycle, Methods of improving efficiency and specific output – open cycle with regeneration, Reheating and inter cooling, Combined steam and gas turbine plant.

Hydro-Electric Power Plant
Elements of hydro electric power plant, Site selection, Hydrology, storage and pondage, General arrangements and operation of hydro power plant, Hydraulic turbines, Turbine size, Pelton wheel turbine, Francis and Kaplan turbines, Selection of turbines, Dams, Spillways, gates, Intake and out take works, Canals and layout of penstocks, Water hammer and surge tank, Simple numerical on hydrographs and number of turbine required, Hydraulic electric power plants in India.

Nuclear Power Plant
Nuclear fusion and fission, Chain reaction, Nuclear fuels, Components of nuclear reactor, Classification of reactors, Pressurized water reactor, Boiling water reactor, Gas cooled reactor, CANDU reactor, Fast breeder reactor, Nuclear ash and its disposal, Nuclear power plants in India.

TEXT BOOKS

OTHER BOOKS
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
   Basic Elements of Digital Signal Processing Systems, Need and advantages of Digital Signal Processing; Classification of systems: Continuous, discrete, linear, causal, stable, dynamic, recursive, time variance; classification of signals: continuous and discrete, energy and power; Sampling Theorem, Practical sampling.

2. Discrete Time System Analysis
   Linear Time Invariant systems, Stability and Causality, Solution of Linear constant coefficient difference equations, Convolution, Correlation, Z-Transform and its properties, Inverse Z transform, Solution of difference equation using Z-Transform.

PART B

4. Design of Digital Filters

5. 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.

(5 hours)

6. **DSP Processors**
   Introduction to DSP architecture - Harvard architecture, TMS320C5X Architecture, Instruction set, Memory and Addressing Modes.

(5 hours)

**TEXT BOOKS RECOMMENDED**


**OTHER BOOKS:**

1. “Digital Signal Processing” by E C Ifeacher and B W Jervis

**EE-758**

**Digital Signal Processing Lab**

Marks: 50
Credits : 2

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**List of Experiments:**

1. Introduction to MATLAB.
2. Effect of noise on signals in MATLAB.
4. Convolution of sequences in MATLAB.
5. Correlation of sequences in MATLAB.
7. System Response to Arbitrary Inputs.
8. DFT & IDFT of two sequences.
9. FFT of two Sequences.
10. Circular Convolution.
11. overlap-add method and overlap-save methods.
12. FIR Filter Design in MATLAB.
13. IIR Filter Design in MATLAB.
15. Implementation of digital filter banks.
EE-709(a)
Optical Communication (Theory)

External:  50  
Sessional:  50  
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
   Evolution of fiber optic system, Element of an Optical Fiber, Elements of basic communication system, communication system architecture, advantages and need of optical communication.
   (7 hours)

2. Optical Fiber Wave Guides
   Ray Theory of Transmission: Total Internal reflection, Acceptance Angle, Numerical Aperture, Electromagnetic mode theory for optical communication of both types of fibers viz step index fiber and graded index fibers, Fiber materials, fiber fabrication, fiber to fiber joints, fiber splicing, optical fiber connectors
   (7 hours)

3. Signal Degradation in Optical Fibers
   (9 hours)

PART-B

4. Optical Sources and Detectors
   (9 hours)

5. Light Wave System
   Coherent, homodyne and heterodyne keying formats, BER in synchronous – and asynchronous – receivers, Multichannel, WDM, multiple access networks, DM
components, TDM, Subcarrier and Code division multiplexing. (6 hours)

6. **Principles of Optical Networks**
First and second generation optical networks: system network evaluation. SONET /SDH, MAN layered architecture-broadcast and select networks-MAC protocols, test beds, wavelength routing networks (7 hours)

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


**OTHER RECOMMENDED BOOKS**

2. Govind P. Agrawal, "Fiber optic communication systems" third edition, Wiley India

**EE-757**

**Optical Communication Lab**

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

1. To study the propagation loss and bending loss in optical fiber.
2. To set up a fiber optic analog link.
3. To set up a digital fiber optic link.
4. Study of intensity modulation technique using analog and digital input signal.
5. To study the frequency modulation and demonstrate voice transmission through optic fiber using FM.
6. Measurement of optical power and propagation loss using optical power meter.
7. To determine the bit rate supported by the fiber optic link.
8. To study the characteristics of PIN diode.
9. To demonstrate the concept of WDM system.
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**
   Evolution of Mobile Communication Systems, Paging systems, cordless telephone systems, cellular telephone systems, comparison of common wireless communication systems, 2G cellular networks, 2.5 G wireless network, HSCSD, GPRS, EDGE technology, 3G wireless network, UMTS, 3G CDMA2000, 3G TD-SCDMA, 4G networks, WiMAX standard, LTE standard, Wireless Local Loop, Blue tooth and Personal Area Networks

   (8 hours)

2. **Cellular System Design Fundamentals**
   Frequency reuse, Channel alignment strategies, handoff strategies, interference and system capacity, Near for problems, power control, improving coverage and capacity in cellular systems, parameters for mobile multipath channel, Small scale fading.

   (7 hours)

3. **Modulation Techniques**
   Wireless Modulation technique and hardware, Characteristics of air interface, Path loss models, wireless coding techniques, Digital modulation techniques and Spread Spectrum Modulation techniques

   (8 hours)

PART B

4. **Diversity Techniques for Mobile Radio Systems**
   Dispersive channels, space diversity, frequency diversity, Polarization diversity, Hybrid and quadruple diversity, RAKE receiver, Equalizer techniques. Fundamentals of channel coding.

   (5 hours)

5. **Overview of Multiple Access Techniques**
   Simplex, Duplex TDD and Time Division Duplex, Time Division Multiple
Access (TDMA), FDMA, Orthogonal Frequency Division Multiplexing (OFDM) and CDMA.

(5 hours)

6. **Wireless Networking**
   Difference between wireless and fixed telephone networks, Development of wireless networks, Common Channel signaling, Broad band ISDN & ATM, Signaling System No.7 (SS-7).

(5 hours)

7. **Wireless Systems and Standards**
   Global system for Mobile (GSM); Services, Features, System Architecture and Channel Types, Frame Structure for GSM, CDMA Digital standard (IS 95); Frequency and Channel specifications, Forward CDMA Channel and Reverse CDMA channel, CT2 Standard for Cordless Telephones, Personal Access Communication System

(7 hours)

**TEXT BOOKS**


**OTHER BOOKS:**

2. Wireless Communication and Networking By Jon W Mark, PHI, Edition Latest

**EE-757**

**Optical Communication Lab**

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

**List of Experiments**

1. To study the block diagram of mobile phone trainer kit.
2. To study and measure charging phenomena in mobile phone trainer kit.
3. To study and analyze vibrator in mobile phone trainer kit.
4. To study and analyze buzzer in mobile phone trainer kit.
5. To study the SIM card detection in mobile trainer kit.
6. To study GSM trainer kit.
7. To study and perform AT commands in GSM trainer kit.
8. To prepare a project based on wireless communication.
Paper Title: Accounting for Managers

Note: 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.

Objectives: To understand the concept and importance of accounting for managers.

Part – A

Accounting and its functions; Basic Accounting Concepts and Accounting Conventions; Accounting Principles; Generally Accepted Accounting Policies (GAAP); Accounting Standards; Branches of Accounting: Financial Accounting; Cost Accounting; Management Accounting; Accounting Equation; Accounting Structure; Types of Accounts.
Rules regarding Journal Entries; Recording of Journal Entries; Ledger Posting; Trial Balance; Preparation of Final Accounts; Trading Account; Profit & Loss Account; Balance Sheet; Treatment of Adjustments into trial balance.
Meaning of Management Accounting; Nature; Scope; Objectives; Functions of Management Accounting; Relationship between Financial and Management Accounting; Tools and Techniques of Management Accounting; Limitations; Meaning of Financial Statement; Importance and Limitations of Financial Statement; Meaning and Objectives of Financial Statement Analysis; Limitation of Financial Analysis.
Ratio Analysis: Meaning of Ratio; Interpretation of Ratios; Significance of Ratio Analysis; Limitations of Ratio Analysis; Classification of Ratio; Analysis of Short-term financial position; Analysis of Long term financial position; Analysis of profitability.

Part – B

Fund Flow Analysis: Meaning and Concept of Funds; Meaning of Fund Flow; Meaning of Fund Flow Statement; Significance; Limitations; Procedure of Preparing Fund Flow Statement; Schedule Showing Change in working capital; Adjusted Profit & Loss Account; Statement of Sources and Applications of Funds, Treatment of Adjustment;
Cash Flow Analysis: Meaning; Classification of Cash Flow; Comparison between Fund Flow Statement and Cash Flow Statement; Difference between Cash Flow Statement and Cash Budget Limitations; Preparation of Cash Flow Statement (as per AS-3); Treatment of Adjustments.

Text Books:

1. Managerial Accounting, Hilton, Ramesh, Jaidev, TMH
Objective: The objective of this course is to make the students familiar with statistics used in Business Research Methodology.

Part A

Introduction to Descriptive Statistics: Types of Data, Measures of Central Tendency, Measures of Dispersion, Range, Quartile Deviation, Mean Deviation, and Standard Deviation, Skewness & Kurtosis. Probability: Basic probability concepts, Joint probability, Conditional probability, Bayes Theorem, Random Variables and Discrete Probability distributions: Poisson, Binomial and Normal, Normally distributed variables, areas under the standard normal curve.

Research Design: Meaning, Characteristics and various concepts relating to research design and classification of research design, Importance.

Measurement and Scaling: Data Types Nominal, Ordinal and Ratio scale; scaling techniques.

Part B

Formulation of Hypothesis: Confidence Intervals, Meaning, Characteristics and concepts relating to testing of Hypothesis (Parameter and statistic, Standard error, Level of significance, type-I and Type-II errors, Critical region, one tail and two tail tests); Procedure of testing Hypothesis. Numerical problems based on chi-square test, Hypothesis tests for one population mean: Z test, t-test, Wilcoxon Signed-Rank test, Inferences for two population means, Mann-Whitney Test, F-test.

Data Analysis & Interpretation: Introduction to Multivariate analysis- Multiple and partial correlation, Analysis of Variance (ANOVA)-One way and Two way ANOVA. Introduction to discriminant analysis and Factor Analysis.

Suggested Readings:
1. Business Research Methods, William G. Zikmund, Cengage Learning India
2. Business Research Methods, Cooper, D.R., & Schindler, Tata McGraw-Hill