B.E.MBA integrated in ELECTRICAL & ELECTRONICS
VIII SEMESTER

Elective-I
(i) Electrical Machine Design
(ii) High Voltage AC-DC
(iii) Advance Control Systems

Elective-II
(i) Wireless Communication
(ii) Optical Communication

A student can exercise option I and Option II according to the following:

A student may opt for one semester training in lieu of subjects of 8th Semester. The marks for six months training will be equal to the total marks of 8th Semester study. A student can opt for six semester training under following conditions:-

a) The student got selected for job in campus placement and the employer is willing to take that student for the training.

b) The student got offer of pursuing training from reputed government research organization/govt. sponsored projects/govt. research institution provided that student should not be paying any money to get trained. For pursuing this training student needs the prior approval from the Chairperson/Coordinator of the respective branch.

c) BEMBA students are required to do six months training in management function areas only
EE-801  
Non – Conventional Energy Sources

External: 50
Sessional: 50
Credits: 4

L T P 3 1 0

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: Limitation of conventional energy sources, need and growth of alternative energy source, basic scheme and application of direct energy conservation.

(4)

MHD GENERATORS: Basic principles, gaseous, conduction and hall effect, generator and motor effect, different types of MHD generator, types of MHD material, conversion effectiveness, analysis of constant area MHD generator, practical MHD generator, application and economic aspects.

(8)

THERMO-ELECTRIC GENERATORS: Thermoelectric effects, Seeback effect, Peltier effect, Thomson effect, thermoelectric converters, figures of merit, properties of thermoelectric material, brief description of the construction of thermoelectric generators, application and economic aspect.

(8)

PHOTO VOLTAIC EFFECT AND SOLAR ENERGY: Photovoltaic effect, different types of photovoltaic cells, cell fabrication, characteristics of photovoltaic cells, conversion efficiency, solar batteries, application, solar radiation analysis, solar energy in India, solar collectors, solar furnaces and applications.

(8)

Part-B
FUEL CELLS: Principle of action, Gibb's free energy, general description of fuel cells, types, construction, operational characteristics and application.

(6)

MISCELLANEOUS SOURCES: Geothermal system, characteristic of geothermal resources, choice of generator set, electric equipment precautions low hydro-plants, definition of low head hydrometer, choice of site, choice of turbine wind power, history of wind power, wind machines, theory of wind power, characteristic of suitable wind power site, tidal energy, idea of tidal energy, tidal electric generator.

(10)

Recommended Books:

EE-802 (a)  
Electrical Machine Design

External: 50  
Sessional: 50  
Credits: 4

L  T  P  3  1  0

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. **Principles of design of Machines**: Specific magnetic and electric loadings output, Real and apparent flux densities, temperature rise calculation, Separation of main dimension for DC machines, Induction machines and synchronous machines.  
   
2. **Heating cooling and ventilation**: Cooling of machines, types of ventilation, continuous and intermittent rating.  

3. **Design of Transformers**: General considerations, output equation, emf per turn, choice of flux density and current density, main dimensions, leakage reactance and conductor size, design of tank and cooling tubes, calculation of losses, efficiency and regulation, forces winding during short circuit.  

Part-B

4. **Three Phase Induction Motors**: General considerations, output equation, choice of specific electric and magnetic loadings, efficiency, power factor, number of slots in stator and rotor, elimination of harmonic torques, Design of stator and rotor winding, slot leakage flux, leakage reactance, equivalent resistance of squirrel cage rotor, magnetizing current, efficiency from design data.  

5. **Alternators**: Types of alternators, comparison, specific loadings, output co-efficient, design of main dimensions.  


Books Suggested:

2. Say M.G. The Performance and Design of A.C. Machines, PITMAN (ELBS).
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:** Introduction of DC Power transmission technology – Comparison of AC and DC transmission – Application of DC transmission – Description of DC transmission system – Planning for HVDC transmission – Modern trends in DC transmission.

(7)

**ANALYSIS OF HVDC CONVERTERS:** Pulse number – Choice of converter configuration – Review of Graetz circuit – valve rating, Transformer rating, Simplified analysis of Graetz circuit, without overlap only, Principles of DC link control, converter bridge characteristics – Characteristics of a twelve pulse converter – Detailed analysis of converters.

(10)

**HARMONICS AND FILTERS:** Sources of harmonics in HVDC systems – Smoothing reactors – Corona and radio interference effects – harmonic distortion factor, types of AC filters, DC filters.

(6)

Part-B

**GENERATION OF IMPULSE VOLTAGE AND CURRENT:** Introduction to standard lightning and switching impulse voltages, analysis of single stage impulse generator, expression for output impulse voltage, multistage impulse generator, components of multistage impulse generator, generation of switching impulse voltage, generation of high impulse current.

(8)

**MEASUREMENT OF HIGH VOLTAGES:** Chubb for HVAC measurement. Standard sphere gap measurements of HVAC, HVDC and impulse voltages, Factors affecting the measurements, Surge current measurement-Klydanograph and magnetic links.

(6)

**NON-DESTRUCTIVE INSULATION TESTING TECHNIQUES:** Dielectric loss and loss angle measurements using Schering Bridge, transformer ratio Arms Bridge, need for discharge detection, factor affecting the discharge detection, discharge detection methods-straight and balanced methods.

(8)

**TEXT BOOKS:**


REFERENCE BOOKS:


EE- 802(c)
Advanced Control Systems

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

Review of Control Engineering: Time response and Frequency response methods, Root locus method; Compensation Techniques and Controllers: Design of feedback control system; Types of compensation: Series or cascade, feedback, state feedback, series feedback; Lead compensator; Lag compensator; Lag-lead compensator, Controllers: PI, PD, PID.

(12)

State Space Techniques: Review of state space representation of systems by various methods. Solution of state equations-state transition matrix. Transfer function from state variable model; Controllability & observability of state variable model; optimal control systems; pole placement using state variable; limitations of state variable feedback.

(10)

Part B

Digital Control Systems: Introduction; sampled data control systems: Sampler and hold circuit; z-transform; Pulse transfer function; Stability analysis of discrete systems.

(10)

Robust Control Systems: Robust control systems and system sensitivity analysis of robustness; Systems with uncertain parameters; Design of Robust control systems; Three term PID controller.

(13)

Recommended Books:
1. Automatic Control Systems by B.C.Kuo, Prentice Hall of India
2. Modern Control Engineering by Ogatta, Prentice Hall of India.
4. Modern Control Systems by Dorf and Bishop, Addison Weslay.
EE-804 (a)
Wireless Communication

External: 50  
Sessional: 50  
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
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, Wireless Local Loop, Blue tooth and Personal Area Networks

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.

Modulation Techniques
Amplitude Modulation, Angle modulation, Digital Modulation, Spread Spectrum Modulation techniques

Part-B

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

Overview of Multiple Access Techniques
Simplex, Duplex TDD and Time Division Duplex, Time Division Multiple Access(TDMA), FDMA and OFDM, CDMA, Hybrid multiple access, Management of voice, Data and Video(Multimedia) information

Wireless Networking
Difference between wireless and fixed telephone networks, ISDN, Development of wireless networks.

Wireless Systems
GSM, GSM Architecture, CDMA Digital cellular standard, IS-95 system.

Books Recommended:

EE-854(a)
Wireless Communication Lab.

Sessional: 50 L T P
Credits : 1 0 0 2

Practicals related to Theory.
EE-804(b)
Optical Communication

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

Overview Of Optical Fibre Communication:
Elements of basic communication system, communication system architecture and advantages of optical communication.
(02)

Optical fibre wave guides, transmission characteristics and fabrication techniques:
Ray Theory of Transmission, Electromagnetic mode theory for optical communication of both types of fibers viz step index fiber and graded index fibers. Attenuation, Material absorption losses, linear and non linear scattering losses, fiber bend loss, dispersion viz intermodal dispersion and intramodal dispersion, overall fiber dispersion and polarization. Preparation of optical fiber: liquid-phase techniques, vapor phase deposition techniques
(12)

Couplers And Connectors:
Connector Principles, Fiber End Preparation, splices, connectors
(03)

Optical Fiber Sensors:
Intensity modulated sensor - general features, intensity modulation through light interruption, shutter multimode fiber sensors and reflective fiber optic sensors.
(06)

Part-B

Optical Sources And Detectors:
Sources: Basic principle of surface emitter LED and edge emitter LED- material used, structure, internal quantum efficiency and characteristics, LASER Diode - material used, structure, internal quantum efficiency and characteristics, working Principle and characteristics of Distributed feedback (DFB) laser. Detectors: PIN photodiode - material used, working principle & characteristics, Avalanche Photodiode: - material used, working principle and characteristics.
(14)

Optical Fiber Measurements:
Total Fiber attenuation measurement using cut back technique, dispersion measurement in frequency and time domain, fiber refractive index profile measurement using interferometric methods, Numerical Aperture measurement and fiber diameter measurement.
(08)

Books Recommended:
List of Experiments:

1. To determine the Numerical aperture of a given fibre & losses in optical fibre.
2. To determine the V.parameter, the core radius & core cladding dielectric constant difference of a step index single mode fibre.
3. To measure the cut of the wavelength of a single fibre.
4. To study fibre optical analog link
5. To study fibre optical digital link
6. To study the effect of EMI/RFI on a fibre medium.
7. To setup the multiplexer & observe the simultaneous transmission of several channels on fibre optical links.
8. To study Manchester coding/decoding of fibre optical link.
9. To study LASER communication system
10. Use the connecterisation/kit/splicing kit
11. To study the following instruments
    (a) Fibre optical power meter
    (b) Fibre optical power source
12. To study optical fibre system using laser
13. To study bending losses in OFC.
Objectives: The main objective of this subject is to help the students to understand the nature, scope, complexities and process of defining a business research question. The learning focus is on developing business research skills to underpin the approach taken to a work integrated project.

PART-A
Research Design formulation, Exploratory, Descriptive and Casual Research, Exploratory Research Design- Secondary Data, Primary Data, Qualitative Research-Focus Group Interviews, Depth Interviews, Analysis of Qualitative Data, Survey and observation- Survey methods, Observation method, Casual Research Design- Experimentation, Validity in Experimentation, Extraneous variables, Statistical Designs-Randomized-Block Design, Latin Square Design, Factorial Design

Measurement and Scaling- Primary Scales of measurement, Comparative Scaling Techniques, Non comparative Scaling techniques-Likert ,Semantic Differential Scale, Stapel Scale, Questionnaire Design- question content, structure and order

PART-B
Sampling Design: Meaning and need of Sampling, Probability and non-probability sampling design, simple random sampling, systematic sampling, stratified sampling, cluster sampling and convenience,sampling , judgement and quota sampling (non-probability), determination of sample size, Hypothesis Testing, Parametric and Non-Parametric Tests

Discriminant and Logit Analysis- Formulating the problem for Discriminant analysis, Multiple Discriminant Analysis, Logit model

Factor analysis, Cluster analysis and Multidimensional Scaling - Conducting Factor analysis, Cluster analysis and Multidimensional Scaling- Conjoint Analysis

Text Books:
2. Marketing Research-Text and Cases, Rajendra Nangundkar , TMH
3. Marketing Research –GC Beri, TMH
4. Marketing Research- Parshuram, Dhruv Grewal, R.Krishnan – Biztantra
Paper Title: Financial Management

**Paper Code:** IBM-802  
**Credits:** 3  
**Max. Marks (Final Exam):** 50  
**Max. Marks (Sessional Exam):** 50  
**Time:** 3 Hours  
**Total Lectures:** 45 L T P: 3 0 0

**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 from each part.

**Objective:** The objective of this course is to create basic understanding of corporate finance, Capital Budgeting decisions, working capital management, project management etc in the Engineering profession.

**PART-A**

Introduction to Financial Management: Meaning; Scope; Finance Function; Financial Goals; Agency Problem; Relationship of Finance with Accounts and Economics.

Sources of Finance: Features; Advantages and Limitations of Equity Shares; Preference Shares; Debentures; Term-Loans; Right Issue.

Cost of Capital: Meaning; Calculation of Cost of Debt Capital; Equity Capital; Preference Capital; Retained Earnings; Weighted Average Cost of Capital.

Capital Structure: Meaning; Determinants; Assumptions; Net Income and Operating Income Approach; Traditional Position; M-M Position; EBIT and EPS Analysis; Capital Structure and Taxation.

Leverage Analysis: Meaning; Types; Estimation of Financial; Operating and Combined Leverage; Relation of Financial Leverage with Risk and Return.

Management of Working Capital: Meaning of WC; Need of WC Management; Determinants of WC; Operating Cycle; Estimation of WC.

**PART-B**

Inventory Management: Meaning; Need to hold Inventory; Objective of Inventory Management; Inventory Investment Analysis; Inventory Control System.

Capital Budgeting: Meaning; Basic Principles of Costs and Benefits; Investment Criteria; Payback Method; Accounting Rate of Return Method; Net Present Value Method; Benefit-Cost Ratio; Internal Rate of Return; Capital Rationing; Introduction to Basic Techniques of Risk Analysis in Capital Budgeting.

Dividend Decisions: Meaning and Types of Dividend; Issues in Dividend Policy; Traditional
Model; Walter Model; Gordon Model; Miller and Modigliani Model; Bonus Shares and Stock Splits.

**Suggested Readings:**

1. Financial Management, Van Horne, PHI