# SWAMI VIVEKANAND UNIVERSITY, SIRONJA, SAGAR (M.P.)


# SYLLABUS

## For

## B.Tech. in Electrical Engg.
## Semester -IV

**Swami Vivekanand University, Sironja Sagar**
**2013-2014**

# Swami Vivekanand University,Sagar

# B.TECH ELECTRICAL 4th SEM

| SUBJECT CODE | SUBJECT |
|---|---|
| BT-401 | MANAGEMENT-I |
| EE-402 | MATHEMATICS III |
| EE-403 | ELECTRICAL POWER |
| EE-404 | MICROPROCESSOR AND INTERFACING |
| EE-405 | CONTROL SYSTEM |
| EE-406 | COMPUTER LAB - II |
| EE-407 | SELF STUDY (INTERNAL ASSESMENT) |
| EE-408 | SEMINAR / GROUP DISCUSSION (INTERNAL ASSESSMENT) |

| SUBJECT CODE | THEORY | | | | | | | | PRACTICAL | | | | | | CREDIT | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TH | | MS | | TQ | | TW | | PR | | LW | | LQ | | | | |
| | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | TH | PR | MAX |
| BT-401 | 70 | 22 | 20 | - | 10 | - | - | - | - | - | - | - | - | - | 4 | - | 100 |
| EE-402 | 70 | 22 | 20 | - | 10 | - | - | - | - | - | - | - | - | - | 4 | - | 100 |
| EE-403 | 70 | 22 | 20 | - | 10 | - | - | - | 30 | 9 | 20 | - | - | - | 4 | 2 | 150 |
| EE-404 | 70 | 22 | 20 | - | 10 | - | - | - | 30 | 9 | 20 | - | - | - | 4 | 2 | 150 |
| EE-405 | 70 | 22 | 20 | - | 10 | - | - | - | 30 | 9 | 20 | - | - | - | 4 | 2 | 150 |
| EE-406 | - | - | - | - | - | - | - | - | 30 | 9 | 20 | - | - | - | - | 2 | 50 |
| EE-407 | - | - | - | - | - | - | - | - | - | - | - | - | 50 | - | - | 2 | 50 |
| EE-408 | - | - | - | - | - | - | - | - | - | - | - | - | 50 | - | - | 2 | 50 |
| | | | - | | - | | - | | | | - | | - | | | | |

**TH- THEORY MS- MID SEM**

**TW- THEORY TERM WORK**
**PR- PRACTICAL LW- LAB WORK**
**PQ- PRACTICAL QUIZ G - GRADE GP- GRADE POINT**

**F$-ABSENT**
**#-GRACE**

**Subject Name: Management – I**

| Sr. No | Course content |
|---|---|
| 1. | **Introduction to Management and Organizations**<br><br>Innovative management for Turbulent times<br>Functions of management<br>Planning, Organizing, Controlling and Leading<br>Types of Managers<br>Managerial Roles |
| 2. | **Management history**<br><br>Schools of Management<br>Scientific management<br>The Behavioral Approach<br>The Systems approach<br>The contingency approach |
| 3. | **Organizational Structure and Design**<br><br>Types of structures<br>Work specialization<br>Departmentalization<br>Chain of Command<br>Span of Control<br>Centralization and Decentralization<br>Formalization |
| 4. | **Organizational Culture and Environment**<br><br>Concept of culture and its importance<br>Attributes of culture<br>How does culture affect managers and employees |
| 5. | **Social responsibility and Managerial ethics**<br><br>Concept of corporate social responsibility and ethics<br>Stakeholders and its management<br>Ethical issues in management |

## Reference Books:


1 'Management' – Stephen P. Robbins, Mary Coulter, Neharika Vohra – Pearson Prentice Hall of India, New Delhi, Tenth edition

2 'Essentials of Management', Koontz and Weihrich, Tata McGraw Hill, 2004, 6th Edition

3 Essentials of management – Adrew J. Durbrin, India edition, 7th Edition, Thomson – South Western

4 Principles of Management, Charles WL Hill and Steven L McSane, The McGraw Hill Companies, 2008

5 Principles of Management, Richard L. Daft, Cengage Learning, 2009

**Subject Name** Mathematics-3

| Sr.No | Course content |
|---|---|
| 1. | Complex numbers and functions:<br>Limits of Functions, Continuity, Differentiability, Analytic functions, Cauchy-Riemann Equations, Necessary and Sufficient condition for analyticity, Properties of Analytic Functions, Laplace Equation, Harmonic Functions, Finding Harmonic Conjugate functions<br>Exponential, Trigonometric, Hyperbolic functions and its properties. Multiple valued function and its branches: Logarithmic function and Complex Exponent function. |
| 2. | Complex Integration:<br>Curves, Line Integrals (contour integral) and its properties. Line integrals of single valued functions, Line integrals of multiple valued functions (by choosing suitable branches). Cauchy-Goursat Theorem, Cauchy Integral Formula, Liouville Theorem, Fundamental Theorem of Algebra, Maximum Modulus Theorems. |
| 3. | Power Series:<br>Convergence (Ordinary, Uniform, Absolute) of power series,<br>Taylor and Laurent Theorems, Laurent series expansions. Zeros of analytic functions. Singularities of analytic functions and their classification<br>Residues: Residue Theorem, Rouche's Theorem, Argument Principle. |
| 4. | Applications of Contour Integration:<br>Evaluating various type of definite real integrals using contour integration method. |
| 5. | Conformal Mapping and its applications:<br>Mappings by elementary functions, Mobius transformations, Schwarz-Christoffel transformation. |
| 6. | Interpolation:<br>Interpolation by polynomials, divided differences, error of the interpolating polynomial. |
| 7. | Numerical integration:<br>Composite rules, error formulae, Gaussian integration. |
| 8. | Linear algebraic equation:<br>Solution of a system of linear equations: implementation of Gaussian elimination and Gauss-Seidel methods, partial pivoting. |

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| 9. | Roots of equation:<br>Solution of a nonlinear equation: Bisection and Secant methods, Newton's method, rate of convergence, Power method for computation of Eigen values. |
| 10. | Ordinary differential equations:<br>Numerical solution of ordinary differential equations, Euler and Runge-Kutta methods. |

Reference Books:


1) R. V. Churchill and J. W. Brown, Complex variables and applicati (7th Edition), McGraw-Hill (2003).
2) J. M. Howie, Complex analysis, Springer-Verlag (2004).
3) M. J. Ablowitz and A. S. Fokas, Complex Variables- Introduction and Applications, Cambridge University Press, 1998 (Indian Edition).
4) E. Kreyszig, Advanced engineering mathematics (8th Edition), John Wiley (1999).
5) S. D. Conte and Carl de Boor, Elementary Numerical Analysis- An Algorithmic Approach (3rd Edition), McGraw-Hill, 1980.
6) C. E. Froberg, Introduction to Numerical Analysis (2nd Edition), Addison-Wesley, 1981.

Subject Name Electrical Power

| Sr.No | Course content |
|---|---|
| 1. | Steam power station:<br>Schematic arrangement, advantages and disadvantages, choice of site, efficiency of steam power station, Types of prime movers, characteristic, speed control & auxiliaries. Environmental aspects for selecting sites and locations of thermal power stations. |
| 2. | Hydro power station:<br>Schematic arrangement, advantages and disadvantages, choice of site constituents of hydro power plant, Hydro turbine. Environmental aspects for selecting sites and locations of hydro power stations |
| 3. | Nuclear power station:<br>Schematic arrangement, advantages and disadvantages, selection of site, types of reactors, Hazards Environmental aspects for selecting sites and locations of nuclear power stations. |
| 4. | Gas turbine power plant:<br>Schematic arrangement, advantages and disadvantages. |
| 5. | Combined cycle power plant:<br>Combined cycle power plant,Comparison of various power plants |
| 6. | Power Generation by Non Conventional Energy Sources:<br>Solar –<br>Merits and limitations of solar energy conversion and utilization, solar pond and binary cycle solar thermal power plant<br>Wind –<br>Applications, Merits and demerits of wind energy, types of wind energy system, wind turbine generator unit with battery storage facilities |
| 7. | Distribution:<br>Overhead & underground transmission of power, Types of distribution systems, types of cables & their construction, Types of conductors. Types of insulators, string efficiency |
| 8. | Transmission line parameters:<br>Inductance of 1-phase, two-wire line and composite conductor lines, inductance of 3-phase line with symmetrical and unsymmetrical spacing with and without transposition, double circuit line, bundled conductors, resistance and skin effect and proximity effect, , capacitance of 1-phase and 3-phase transmission line, effect of earth on transmission line capacitance performance, Ferranti effect. |

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| 9. | Substation:<br>Classification of Substations, substation equipments. |
| 10. | Power Factor Improvement:<br>Consideration of effect of low power factor, Advantages of power factor improvement, methods of improving power factor, the most economical power factor |
| 11. | Neutral Earthing:<br>Introduction, isolated neutral, earth neutral systems-solid, resistance, reactance. Arc suppression coil, voltage transformer and earthing transformer, earthing systems. |

## Reference Books:


1. Electrical Power Transmission and Distribution, by Sivanagaraju & Satyanarayana, Pearson Edu.
2. Power System Analysis and Design – Glover, Sarma , Overbye. Cengage Publication
3. Energy Technology by S. Rao & Dr. B.B.Parulekar
4. Renewable energy sources and conversion technology by N.K. Bansal
5. Renewable Energy Sources – G. D. Rai
6. Power System Generation– B.A. Oza
7. Electrical Power Stations– M.V. Deshpande, PHI Publications
8. Electrical Power — Dr. S.L. Uppal,
9. A course in electrical power — Soni, Gupta and Bhatnagar

Subject Name MICROPROCESSOR AND INTERFACING

| Sr.No | Course content |
|---|---|
| 1. | Introduction to Microprocessor, Microprocessor systems with bus organization, Microprocessor Architecture & Operations, Memory, I/O Device, Memory and I/O Operations |
| 2. | 8085 Microprocessor Architecture, Address, Data And Control Buses, Pin Functions, Demultiplexing Of Buses, Generation Of Control Signals, Instruction Cycle, Machine Cycles, T-States, Memory Interfacing. |
| 3. | Assembly Language Programming Basics, Classification of Instructions, Addressing Modes, 8085 Instruction Set, Instruction And Data Formats, Writing, Assembling & Executing A Program, Debugging The Programs, Decision Making, Looping, Stack & Subroutines, Developing Counters And Time Delay Routines, Code Conversion, BCD Arithmetic And 16-Bit Data Operations. |
| 4. | Interfacing Concepts, Ports, Interfacing Of I/O Devices, Interrupts In 8085, Interfacing of Data Converters (D-To-A And A-To-D), Programmable Interfacing Devices Like 8279 Keyboard/Display Interface, 8255A PPI, 8253/8254 Timer, 8259A PIT, 8237 DMA Controller, Serial I/O Concepts, SID And SOD, 8251A USART. Interfacing of above chips With 8085, Programming them In Deferent Modes, Practical Applications |

## Reference Books:


1. Microprocessor Architecture, Programming, and Applications with the 8085 - Ramesh S. Gaonkar Pub: Penram International.
2. Microcomputers and Microprocessors: The 8080,8085 and Z-80 Programming, Interfacing and Troubleshooting by John E. Uffenbeck.
3. Microprocessor and Microcontroller fundamentals. The 8085 and 8051 Hardware and Software by William Kleitz.

Subject Name Control System

| Sr.No | Course Content |
|---|---|
| 1 | Introduction to Control Systems:<br>Introduction, Examples of Control Systems, Closed-loop Control versus Open-Loop Control |
| 2 | Mathematical Modeling of Dynamic Systems:<br>Introduction, Transfer Function and Impulse-Response Function, Automatic Control Systems, Modeling in state Space, State-Space Representation of Dynamic Systems, Transformation of Mathematical Models with MATLAB, Mechanical Systems, Electrical and Electronic Systems, Signal Flow Graphs, Linearization of Nonlinear Mathematical Models |
| 3 | Mathematical Modeling of Fluid Systems and Thermal systems:<br>Introduction, Liquid-Level Systems, Thermal Systems |
| 4 | Transient and Steady-State Response Analyses:<br>Introduction, First-Order Systems, Second-Order Systems, Higher-Order Systems, Transient-Response Analysis with MATLAB, Routh's Stability Criterion, Effects of Integral and Derivative Control Actions on System Performance, Steady-State Errors in Unity-Feedback Control Systems |
| 5 | Root-Locus Analysis:<br>Introduction, Root-Locus Plots, General Rules for Constructing Root Loci, Root-Locus Plots with MATLAB, Positive Feedback Systems, Conditionally Stable Systems, Root Loci for Systems with Transport Lag |
| 6 | Frequency-Response Analysis:<br>Introduction, Bode Diagrams, Plotting Bode Diagrams with MATLAB, Polar Plots, Drawing Nyquist Plots with MATLAB, Log-Magnitude-versus-Phase Plots, Nyquist Stability Criterion, Stability Analysis, Relative Stability, Closed-Loop Frequency Response of Unity-Feedback Systems |

## Reference Books:


1. Modern Control Engineering by Katsuhiko Ogata, 4th Edition, Prentice Hall of India.
2. Automatic Control Systems by Benjamin C.Kuo, 8th Edition, Farid Golnaraghi, John Wiley & Sons.