RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

EX501 Electrical Machine-II

Unit-I

D.C. Machine-I

Basic construction of DC machines; types of DC machines and method of excitation; lap and wave windings; Emf equation; armature reaction and methods of limiting armature reaction; Commutation process and methods for improving commutation; Basic performance of DC generators and their performance characteristics; Metadyne and Amplidyne; permanent magnet DC motors; Brush less dc motors.

Unit-II

D.C. Machine-II

Basic operation of DC motors; Torque equation; Operating characteristics of DC motors, Starting of DC motors- 2point, 3 point and 4 point starters; speed control of DC motors; losses and efficiency of DC machines; testing of DC machines, direct testing, Swinburne's test and Hopkinson's test. Application of DC machines.

Unit-III

Synchronous Machine-I

Construction; types of prime movers; excitation system including brushless excitation; polyphase distributive winding, integral slot and fractional slot windings; emf equation, generation of harmonics and their elimination; armature reaction; synchronous reactance and impedance, equivalent circuit of alternator, relation between generated voltage and terminal voltage, voltage regulation of alternators using synchronous impedance, mmf, zpf and new A.S.A method.

Unit-IV

Synchronous Machine-II

Salient pole machines; two reaction theory equivalent circuit model and phasor diagram; determination of $X_d$and$X_q$by slip test; SCR and its significance; regulation of salient pole alternator, power angle equation and characteristics; synchronizing of alternator with infinite busbar,; parallel operation and load sharing; synchronizing current, synchronizing power and synchronising torque coefficient; synchro scopes and phase sequence indicator; effect of varying excitation and mechanical torque.

Unit-V

Synchronous machine-III

Synchronous motor operation, starting and stopping of synchronous motor, pull in torque, motor under load power and torque, reluctance torque, effect of excitation, effect of armature reaction, power factor adjustment, V curves, inverted V curves, synchronous motors as power factor correcting device, super synchronous and sub synchronous motors, hunting and damper winding efficiency and losses. Analysis of short circuit oscillogram, determination of various transient, sub transient and steady reactances and time constants, expression of transient and sub transient reactances in terms of self and mutual inductances of various winding, short circuit current, equivalent circuit. Single phase synchronous motors- hysteresis motor, reluctance motor. Repulsion motor, stepper motor, switched reluctance

REFERENCE BOOKS

1. M.G. Say, Performance & design of AC machines, CBS publishers & distributors, Delhi, 3rd edition
2. A.E. Clayton & N.N. Nancock, The Performance & design of DC machines CBS publications & distributors, Delhi, 3rd edition
3. P.S. Bhimbra, Electrical Machinery, Khanna Pub.
4. P.S. Bhimbra, Generalized theory of Electrical Machines, Khanna publishers, Delhi,
5. Ashfaq Husain, Electric Machines, Dhanpat Rai, New Delhi
6. I.J. Nagrath& D.P. Kothari, Electric Machines, Tata McGraw Hill , New Delhi,
7. Syed A. Nasar, Electric Machines & Power Systems, Volume I , Tata McGraw Hill, New Delhi
8. M.G. Say, Performance & design of AC machines, CBS publishers & distributors, Delhi, 3rd edition
9. M.G. Say, Performance & design of AC machines, CBS publishers & distributors, Delhi, 3rd edition
10. A.E. Clayton & N.N. Nancock, The Performance & design of DC machines CBS publications & distributors, Delhi, 3rd edition
11. P.S. Bhimbra, Electrical Machinery, Khanna Pub.
12. P.S. Bhimbra, Generalized theory of Electrical Machines, Khanna publishers, Delhi,
13. Ashfaq Husain, Electric Machines, Dhanpat Rai, New Delhi
14. I.J. Nagrath& D.P. Kothari, Electric Machines, Tata McGraw Hill , New Delhi,
15. Syed A. Nasar, Electric Machines & Power Systems, Volume I , Tata McGraw Hill, New Delhi
16. A.E. Fitzerald, C. Kingsley & S.D. Umans , Electric Machinery Tata McGraw Hill ,New Delhi ,5thedition

Experiment List

1. To plot magnetisation characteristic of a separately excited DC generator
2. To perform load test on DC generators.
3. To perform load test on DC series and shunt motor
4. To perform Swinburn's test on a DC machine and find out its efficiency under full load condition.
5. To conduct Hopkinson's test on a pair of DC shunt machine.
6. To perform OCC and SCC test on an alternator and determine its regulation.
7. To determine regulation of alternator using mmf and zpf methods.
8. To synchronise alternator with infinite bus bar.
9. To plot V and inverted V curves for a synchronous motor
10. To find $X_d$and $X_q$of salient pole synchronous machine by slip test.
11. To Determine negative sequence and zero sequence reactance of an alternator.
12. To determine subtransient direct axis and quadrature axis synchronous reactances of salient pole machine.

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New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

EX 502 Power Electronics

UNIT-I

Advantages and application of power electronic devices characteristics, Symbol & application of power diodes, power transistors, GTO, Triac, Diac, Power MOSFET, IGBT, LASCR, Fast recovery diode, schottey diode MCTs. Principle of operation of SCR, Two transistor analogy, brief idea of construction of SCR, Static characteristics of SCR, Condition of turn on & off of SCR Gate characteristics, Method for turning on of SCR, Turnoff methods, different commutation techniques (Class A,B,C,D,E, & F Commutation) firing of SCR, Resistance firing Ckt, Resistance capacitance firing circuit, UJT firing cut, and ramp triggering, firing for 3-Φ circuit. SCR rating & protection of SCR over voltage, Over current, Superior firing, Design of snubber circuit and protection of gate of SCR, heating, cooling & mounting of SCR series and parallel operation of SCR, String efficiency & problem associated with series and parallel operation of SCR.

UNIT-II

Operation and analysis of single phase (Half wave & Full Wave) and multiphase (Three Phase)uncontrolled and controlled rectifier circuit with resistive, resistive & inductive load (continuous & non continuous conduction, FW small & very large inductive loads) and RLE loads. Estimation of average load voltage and load current for above rectifier circuits active and reactive power input. Effect of freewheeling diode and source inductance on performance of these rectifier circuits . Comparison of mid-point & Bridge rectifier circuits.

UNIT-III

Series and parallel inverter, Voltage source & current source inverter, Single phase and three phase bridge inverter, Self-cumulated inverters,, Mc- murray& MC murray bed ford inverters, Voltage control of single phase and three phase bridge inverter, Harmonics & their reduction techniques.

UNIT-IV

Principle of chopper operation, Various control strategies in chopper, Step up & step-up/step down choppers, chopper configuration (Type A,B, C,D, & E), Steady state analysis of chopper circuits, Current & voltage commutation of chopper circuits Jones & Morgens chopper.

UNIT-V

Single phase (midpoint & bridge configuration) and three phase cyclo convertor configuration and operating principles. AC voltage controllers (using SCRs &Traics) single phase full wave controller with R and RL load, Estimation of RMS load voltage, RMS load current and input power factor, three phase AC voltage controller (Without analysis) Dual converter Switched mode voltage regulator buck, Boost, Buch & Boost, Ck regulators.

LIST OF EXPERIMENTS (EXPANDABLE)

1- VI Characteristics Of SCR
2- VI Characteristics Of DIAC
3- VI Characteristics Of BJT
4- Characteristics Of TRIAC
5- VI Characteristics Of MOSFET
6- Transfer Characteristics Of MOSFET
7- Output Characteristics Of IGBT
8- Transfer Characteristics Of IGBT
9- 9 - Single Phase SCR Half Controlled Converter With R Load
10- 1φ Scr Fully Controlled Converter With R-Load
11- Study Of 3φ SCR Half Controlled Converter
12- Study Of 3φ SCR Fully Controlled Converter
13- Study Of Classes Of Commutation A,B,C,D,E,F.

REFERENCE BOOKS

1- M.H. Rashid, Power Electronics Circuits, Devices and Applications, Pearson 2 Education, Singapore, 1993.
2- M Ramsmoorthy, An Introduction to transistor and their application, Affiliated East-West Press.
3- P.C. Sen, Power Electonics, TMH.
4- M.D. Singh, K.B. Khanchandani, Power Electronics, TMH, Delhi, 2001.
5- Chakravarti A., Fundamental of Power Electronics and Drives, Dhanpat Ray & Co.,
6- Dr. P.S. Bhimbhra, Power Electonics, Khanna Pub.

Vedam Subramanyam, Power Electronics New Age International Revised II ed. 2006.

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New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

Departmental Elective EX- 503 (A) Electrical Power Generation & Economy

Unit-I

Introduction: Energy sources and their availability, Principle types of power plants, their special features and applications, Present status and future trends. Hydro Electric Power Plants: Essentials, Classifications, Hydroelectric survey, Rainfall run-off, Hydrograph, Flow duration curve, Mass curve, Storage capacity, Site selection, Plant layout, various components, Types of turbines, Governor and speed regulation, Pumped storage, Small scale hydro–electric plants (mini and micro).

Unit-II

Thermal Power Plant: General developing trends, Essentials, Plant layout, Coal–its storage, Preparation, Handling, Feeding and burning, Cooling towers, Ash handling, Water treatment plant, High pressure boilers and steam turbines, Components of thermal power plant.

Unit-III

Non-Conventional Power Generation: Geothermal power plants, Electricity from biomass, Direct energy conversion systems (Solar and Wind), Thermo-electric conversion system, Fuel cells, Magneto-Hydro dynamic system..

Unit-IV

Gas Turbine Power Plants: Field of use, Components, Plant layout, Comparison with steam power plants, combined steam and gas power plants. Nuclear Power Plant: Nuclear fuels, Nuclear energy, Main components of nuclear power plant, Nuclear reactors types and applications, Radiation shielding, Radioactive and waste disposal safety aspect..

Unit-V

Power Plant Economics: Cost of electrical energy, Selection of type of generation and generation equipment, Performance and operating characteristics of power plants, Economic scheduling principle, Load curves, Effect of load on power plant design, Load forecasting, electric tariffs, Peak load pricing.

REFERENCE BOOKS

1. Deshpande, M.V., Power Plant Engineering, Tata McGraw Hill (2004).
2. Gupta, B.R., Generation of Electrical Energy, S. Chand (1998).
3. Deshpande, M.V., Electrical Power System Design, McGraw Hill (2004).

Wood, A.J. and Wollenberg, B.F., Power Generation and Control, John Wiley (2004).

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

Departmental Elective EX- 503 (B) Wind & Solar Energy

Unit-I

Solar Energy-Basic Concepts: Introduction, The Sun as Source of Energy, The Earth, Sun, Earth Radiation Spectrum, Extra-terrestrial and Terrestrial Radiations, Spectral Power Distribution of Solar Radiation, Depletion of Solar Radiation. Measurement of Solar Radiation, Solar Radiation Data, Solar Time, Solar Radiation Geometry, Solar Day Length, Extra-terrestrial Radiation on Horizontal Surface, Empirical Equations for Estimating Terrestrial Solar Radiation on Horizontal Surface, Solar Radiation on Inclined Plane Surface

Unit-II

Solar Thermal Systems: Introduction, Solar Collectors, Solar Water Heater, Solar Passive Space Heating and Cooling Systems, Solar Industrial Heating Systems, Solar Refrigeration and Air Conditioning Systems, Solar Cookers.

Unit-III

Solar Photovoltaic Systems: Introduction, Solar Cell Fundamentals, Solar Cell Characteristics, Solar Cell Classification, Solar Cell Technologies, Solar Cell, Module, and Array Construction, Maximizing the Solar PV Output and Load Matching. Maximum Power Point Tracker. Balance of System Components, Solar PV Systems, Solar PV Applications.

Unit-IV

Wind Energy: Introduction, Basic Principles of Wind Energy Conversion, History of Wind Energy, Wind Energy Scenario – World and India. The Nature of the Wind, The Power in the Wind, Forces on the Blades, Wind Energy Conversion, Wind Data and Energy Estimation, Site Selection Considerations.Wind energy systems**:** Environment and Economics Environmental benefits and problems of wind energy, Economics of wind energy.

Unit-V

Basic Components of a Wind Energy Conversion(WEC) System: Classification of WEC systems, Advantages and Disadvantages of WECS, Types of Wind Machines (Wind Energy Collectors), Analysis of Aerodynamic Forces Acting on the Blade, Performance of Wind- machines, Generating Systems, Energy Storage, Applications of Wind Energy, Environmental Aspects.

References Books:

1. Wind Energy Comes of Age by Paul Gipe, John Wiley & Sons Inc.
2. Wind power project & development by Joshua Earnest
`3.Solar Engineering and Thermal Processes, J. A. Duffie and W.A. Beckman, 2nd Edition John Wiley and sons.
4. Solar Energy, G. N. Tiwari, Narosa Publishing House

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New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

Departmental Elective EX- 503 (C) Renewable Power Generation

Unit-I

World Energy Use – Reserves of Energy Resources – Environmental Aspects of Energy Utilisation – Renewable Energy Scenario in Tamil nadu, India and around the World – Potentials – Achievements / Applications – Economics of renewable energy systems.

Unit-II

Solar Radiation – Measurements of Solar Radiation – Flat Plate and Concentrating Collectors – Solar direct Thermal Applications – Solar thermal Power Generation – Fundamentals of Solar Photo Voltaic Conversion – Solar Cells – Solar PV Power Generation – Solar PV Applications.

Unit-III

Wind Data and Energy Estimation – Types of Wind Energy Systems – Performance – Site Selection – Details of Wind Turbine Generator – Safety and Environmental Aspects

Unit-IV

Biomass direct combustion – Biomass gasifiers – Biogas plants – Digesters – Ethanol production – Bio diesel – Cogeneration – Biomass Applications

Unit-V

Tidal energy – Wave Energy – Open and Closed OTEC Cycles – Small Hydro-Geothermal Energy – Hydrogen and Storage – Fuel Cell Systems – Hybrid Systems.

REFERENCE BOOKS

1. Rai. G.D., “Non Conventional Energy Sources”, Khanna Publishers, New Delhi, 2011.
2. Twidell, J.W. & Weir, A., “Renewable Energy Sources”, EFN Spon Ltd., UK, 2006.
3. Gupta, B.R., Generation of Electrical Energy, S. Chand (1998).
4. Solar Energy, G. N. Tiwari, Narosa Publishing House

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

Open Elective EX- 504 (A) Industrial Electronics

Unit-I

Power supply, rectifiers (half wave, full wave), performance parameters of power supplies, filters (capacitor,inductor, inductor-capacitor, pi filter), bleeder resistor, voltage multipliers .Regulated power supplies (series and shunt voltage regulators, fixed and adjustable voltage regulators,current regulator), switched regulator (SMPS), comparison of linear and switched power supply, switchmode converter (flyback, buck, boost, buk-boost, cuk converters).

Unit-II

Silicon controlled rectifies (SCR), constructional features, principle of operation, SCR terminology, turn-onmethods, turn-off methods, triggering methods of SCR circuits, types of commutation, comparison ofthyristors and transistors, thermal characteristics of SCR, causes of damage to SCR, SCR overvoltageprotection circuit, Line commutated converters (half wave rectifier withinductive and resistive load, single phase and three phase full wave rectifiers).

Unit-III

Other members of SCR familyTriacs, Diacs, Quadracs, recovery characteristics, fast recovery diodes, power diodes, power transistor,power MOSFET, Insulated gate bipolar transistor (IGBT), loss of power in semiconductor devices,comparison between power MOSFET, power transistor and power IGBT.

Unit-IV

Applications of OP-AMPBasics of OP-AMP, relaxation oscillator, window comparator, Op-comp as rectangular to triangular pulseconverter and vice- versa, Wien bridge oscillator, function generator, frequency response of OP-AMP,simplified circuit diagram of OP-AMP, power supplies using OP-AMP, filters (low-pass, high pass) using OP-AMP

Unit-V

Programmable Logic Controller (PLC)Functions, applications, advantages and disadvantages of PLC over conventional relay controllers,comparison of PLC with process control computer system, factors to be considered in selecting PLC,functional block diagram of PLC, microprocessor in PLC, memory, input and output modules (interfacecards), sequence of operations in a PLC, status of PLC, event driven device, ladder logic language, simpleprocess control applications of PLC, Programming examples..

REFERENCE BOOKS

1. Bishwanath Paul: Industrial Electronics and control, PHI Learning.
2. Rashid: Power Electronics- Circuits, devices and applications, Pearson Education.
3. Singh and Khanchandani: Power Electronics, TMH
4. Bhimbra: Power Electronics, Khanna Publishers.
5. Moorthi: Power Electronics, Oxford University Press.
6. Webb: Programmable Logic Controllers- Principles and Applications, PHI Learning.

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New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

Open Elective EX- 504 (B) Electromagnetic Theory

Unit I

Cartesian, cylindrical & spherical co-ordinate systems, scalar & vector fields, gradient, divergence & curl of a vector field, Divergence theorem & Stokes's theorem, concept of vectors.

Electrostatic Fields – Coulomb's law, electric field intensity due to different charge distribution viz. line charge, sheet charge, Field due to continuous volume – electric potential, properties of potential function, potential gradient equipotential surfaces, line of force, Gauss law, applications of Gauss law, Gauss law in point form, method of images.

Unit II

Laplace's & Poisson's equations, solution of Laplace's equation, Electric dipole, dipole moment, potential & electric field intensity due to dipole, Behavior of conductors in an electric field. Conductor & insulator, electric field inside a dielectric, polarization, Boundary value conditions for electric Field, Capacitance & Capacitances of various types of capacitors, Energy stored and energy density in static electric field, Current density, conduction & convection current density ohms law in point form, equation of continuity.

Unit III

Static Magnetic Field, Biot-Savart's law, Magnetic Field intensity due to straight current carrying filament, circular, square and solenoidal current carrying wire, Relationship between magnetic flux, flux density & magnetic Field intensity; Ampere's circuital law and its applications, magnetic Field intensity due to infinite sheet and various other configurations, Ampere's circuital law in point form, Magnetic force, moving charge in a magnetic field, Lorentz Force on straight and long current carrying conductors in magnetic field, force between two long & parallel current carrying conductors. Magnetic dipole & dipole moment, a differential current loop as dipole, torque on a current carrying loop in magnetic field, Magnetic Boundary conditions.

Unit IV

Scalar magnetic potential and its limitations, Vector magnetic potential and its properties, vector magnetic potential due to different simple configurations; Self and Mutual inductances, determination of self & mutual inductances, self inductance of solenoid, toroid

coils, mutual inductance between a straight long wire & a square loop. Energy stored in magnetic Field & energy density, Faraday's Law, transformer & motional EMFs, Displacement current, Maxwell's equations as Generalization of circuit equations, Maxwell's equation in free space, Maxwell's equation for harmonically varying Field, static and steady fields, Maxwell's equations in differential & integral form.

Unit V

Electro Magnetic Waves : Uniform plane wave in time domain in free space, Sinusoidally time varying uniform plane wave in free space, Wave equation and solution for material medium, Uniform plane wave in dielectrics and conductors, Pointing Vector theorem, instantaneous, average and complex poynting vector, power loss in a plane conductor, energy storage, Polarization of waves, Reflection by conductors and dielectric – Normal & Oblique incidence, Reflection at surface of a conducting medium, surface impedance, transmission line analogy.

References:

1. Mathew N.O Sadiku; Elements of Electromagnetic; Oxford.

2. P.V. Gupta; Electromagnetic Fields; Dhanpat Rai.

3. N.N. Rao; Element of Engineering Electromagnetic; PHI.

4. William H. Hayt; Engineering Electromagnetic; TMH.

5. John D. Kraus; Electromagnetic; TMH.

6. Jordan Balmian; Electromagnetic wave & Radiating System; PHI.

7. David K. Cheng; Fields and Wave Electromagnetic; Addison Wesley.

8. S.P. Seth; Electromagnetic Field ;Dhanpat Rai & Sons

Note: Field plotting of electromagnetic systems on a PC using standard softwares. Application for low and high frequency devices. Suggested softwares, GEMINI(Infolytica), ANSYS, ANSOFT, NISA.

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New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

Open Elective EX- 504 (C) Electrical and Electronic Materials

COURSE OBJECTIVE

The primary objective of the course is to introduce concepts about the properties, characteristics, applications and limitations of Electrical & Electronics engineering materials.

Course contents :

Unit I : Crystal structure of materials, crystal systems, unit cells and space lattices and defects, Classes of Engineering Materials – Metals & alloys, ferrous and non-ferrous alloys, low alloy steels, aluminium alloys, copper alloys, stainless steels, cast iron, ceramics, organic polymers and composite material. Classification of solids from electrical engineering point of view. Conducting material – properties of conductors, characteristics of good conductor material, commonly used conducting materials, conductor materials for overhead lines, types of conductors, conductor for underground cables, conductor materials used in electrical machines, resistor materials, types of resistors, materials for bus bar.

Unit II : Dielectric Materials: Dielectric strength, factors affecting dielectric strength, dielectric loss, dissipation factor, factors affecting dielectric loss, permittivity & polarization, charging and discharging of dielectric, conduction through dielectric. Application of dielectric, different types of capacitors and materials used for them. Insulating materials, their– thermal and chemical, mechanical & electrical property. Insulating materials like ceramic, mica, glass, rubber, resins, wax varnishes, Class of insulator. Transformer oils & their testing. Piezoelectricity & Ferro electricity.

Unit III : Concept of energy band diagram for materials - conductors, semiconductors and insulators Applications of semi conductor materials: type of semi conductors, working and applications of semiconductors, Temperature sensitive elements, photoconductive cells, photo voltaic cells; Varistor, Hall effect generator, LCD, Light dependent resistors, LEDs, piezo – electric materials, semiconductor laser and its characteristics, photo conductors – photo diodes, avalanche photo diode, photo transistors.

Unit IV : Classification of magnetic materials: Dia-magnetism, Para magnetism, Ferro-magnetism, magnetization curve, hysteresis loop, Magnetostriction, Factors affecting permeability and hysteresis, Anti – ferromagnetism, Ferromagnetism, Magnetic resonance, B-H curve for different magnetic materials, loss of magnetism, impurities in ferromagnetic materials, soft and hard magnetic materials, ferrites

Unit V: Superconductivity & it's application. Materials of MHD generator, Thermoelectric generators, Thermionic conductors, Physical properties &Electrical properties of SF6, Specification of SF6 gas for GIS application, Advantages and Applications of SF6, Nanomaterials, Ultra Light materials and metallic foams.

Course outcome :

Student after successful completion of course is expected to possess an understanding of basic of Electrical & Electronics engineering materials.

References:

1. A.J. Dekker; Electrical Engineering Materials; PHI.

2. William F Smith, JavadHashemi, Ravi Prakash 'Material science and engineering', McGraw Hill.

3. James F. Shackelford, Madanapalli K. Muralidhara 'Introduction to Materials Science for Engineers', Pearson

4. Ian P. Jones ' Materials Science for Electrical and Electronics Engineers' Oxford university press

5. C. S. Indulkar and S. Thruvengadem; Electrical Engineering Materials; S. Chand.

6. TTTI Madras; Electrical Engineering Materials; TMH.

7. John Allison; Electrical Engineering Material s & Devices; TMH.

8. Kasap; Electronic Materials and devices; TMH

9. V. Raghvan; Material Science & Engineering; PHI.

10. S.P. Seth & P.V. Gupta; Electrical Engineering Materials; Dhanpat Rai.

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New Scheme Based On AICTE Flexible Curricula

Electrical & Electronics Engineering, V-Semester

EX506 MATLAB

MATLAB

Basic simulation Mechanism and Simulation Tools, Starting and Ending MATLAB, MATLAB Desktop, Help Browser, Types of Files, Command Input Assistance, Operators and Special Characters, Variables and Arrays, Handling Arrays, Useful Built-in Functions, Control Structures, Input/Output Commands, File Handling

Introduction to Plotting

The plot command, Formatting and Labeling a Plot, Multiple Plots, Adding Legend, Sub Plots, Plotting Complex Data, 2-D and 3-D Plots, Plotting a Function, Plot Editor, Interactive Plotting using Plotting Tool

Programming in MATLAB

MATLAB Editor, MATLAB Programming, Debugging MATLAB Programs, MATLAB Debugger, Functions and Function Files, Differential Equation Solver, Symbolic Mathematics, Programming Examples

Basic Electrical and Networks Applications

Analysis of Electrical Networks – Experiments based on Solution of Series-Parallel Circuits, Solution of system with linear equations - Experiments based on mesh and nodal analysis, Experiments for Validation of Network Theorems, Solution of Network Problems.

REFERENCE BOOKS

1. “Modelling And Simulation Using Matlab- Simulink”,2011Dr Shailendra Jain, Willey India.
2. “MatlabProgramming”,Rudra prasad.