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B.Tech. IV-I Sem.	**Th**	**Tu**	**C**
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(13A02701) ELECTRICAL DISTRIBUTION SYSTEMS

Course Objective:

This course mainly focuses the distribution end of the power system in which the characteristics of load, classification of distribution systems, substations, protection of the distribution systems are introduced.

UNIT I

LOAD MODELING AND CHARACTERISTICS

Introduction to Distribution Systems, Load Modeling and Characteristics. Coincidence Factor, Contribution Factor Loss Factor - Relationship between the Load Factor and Loss Factor. Classification of Loads (Residential, Commercial, Agricultural and Industrial) and Their Characteristics.

UNIT II

CLASSIFICATION OF DISTRIBUTION SYSTEMS

Classification of Distribution Systems - Comparison of DC Vs AC and Under-Ground Vs Over - Head Distribution Systems- Requirements and Design Features of Distribution Systems

Design Considerations of Distribution Feeders: Radial and Loop Types of Primary Feeders, Voltage Levels, Feeder Loading, Basic Design Practice of the Secondary Distribution System.

Voltage Drop Calculations (Numerical Problems) In A.C. Distributors for The Following Cases: Power Factors Referred to Receiving End Voltage and With Respect to Respective Load Voltages.

UNIT III

SUBSTATIONS

Location of Substations: Rating of Distribution Substation, Service Area within Primary Feeders. Benefits Derived Through Optimal Location of Substations.

Classification of Substations: Air Insulated Substations - Indoor & Outdoor Substations: Substations Layout Showing the Location of All the Substation Equipment.

Bus Bar Arrangements in the Sub-Stations: Simple Arrangements Like Single Bus Bar, Sectionalized Single Bus Bar, Main and Transfer Bus Bar Double Breaker – One and Half Breaker System With Relevant Diagrams.

UNIT IV

POWER FACTOR IMPROVEMENT

Voltage Drop and Power-Loss Calculations: Derivation for Voltage Drop and Power Loss in Lines, Manual Methods of Solution for Radial Networks, Three Phase Balanced Primary Lines.

Causes of Low P.F -Methods of Improving P.F -Phase Advancing and Generation of Reactive KVAR Using Static Capacitors-Most Economical P.F. for Constant KW Load and Constant KVA Type Loads, Numerical Problems.

Capacitive Compensation for Power-Factor Control - Effect of Shunt Capacitors (Fixed and Switched), Power Factor Correction- Economic Justification - Procedure to Determine the Best Capacitor Location.

UNIT V

DISTRIBUTION AUTOMATION

Distribution Automation (DA) – Project Planning – Definitions – Communication – Sensors –

Supervisory Control and Data Acquisition (SCADA) – Consumer Information Service (CIS) – Geographical Information System (GIS) – Automatic Meter Reading (AMR) – Automation Systems.

Text Books:

1. *"Electric Power Distribution System, Engineering" – by Turan Gonen, Mc Graw-hill Book Company, 1986.*
2. *Electric Power Distribution – by A.S. Pabla, Tata Mc Graw-hill Publishing Company, 4th edition, 1997.*

Reference Books:

1. *Electric Power Distribution Automation by Dr. M. K. Khedkar and Dr. G. M. Dhole, University Science Press, 2010.*
2. *Electrical Power Distribution Systems by V. Kamaraju, Jain Book Depot. 2012.*
3. *Electrical Power Systems for Industrial Plants by Kamalesh Das, JAICO Publishing House, 2008.*
4. *Hand Book of Electric Power Distribution by G. Ramamurthy, 2nd Edition, Universities Press, 2009.*

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(13A02702)DIGITAL SIGNAL PROCESSING

Course Objective:

This course introduces the basic concepts of Signal Processing, Fourier Transformation, Laplace and Z-Transforms, Digital Filter Design and realization.

UNIT I

INTRODUCTION TO DIGITAL SIGNAL PROCESSING

Discrete Time Signals and Sequences, Linear Shift Invariant Systems, Stability and Causality, Linear Constant Coefficient Difference Equations. Frequency Domain Representation of Discrete Time Signals and Systems.

UNIT II

DISCRETE FOURIER SERIES AND FAST FOURIER TRANSFORMS

Properties of Discrete Fourier Series, DFS Representation of Periodic Sequences, Discrete Fourier Transforms: Properties of DFT, Linear Convolution of Sequences Using DFT, Computation of DFT. Relation between Z-Transform and DFS, Fast Fourier Transforms (FFT)-Radix2 Decimation in Time and Decimation in Frequency FFT Algorithms, Inverse FFT and FFT for Composite N.

UNIT III

REALIZATION OF DIGITAL FILTERS

Review of Z-Transforms, Applications of Z-Transforms, Solution of Difference Equations of Digital Filters, Block Diagram Representation of Linear Constant-Coefficient Difference Equations, Basic Structures of IIR Systems, Transposed Forms, Basic Structures of FIR Systems, System Function.

UNIT IV

IIR AND FIR DIGITAL FILTERS

Analog Filter Approximations-Butterworth and Chebyshev, Design of IIR Digital Filters from Analog Filters, Design Examples: Analog-Digital Transformations, Characteristics of FIR Digital Filters, Frequency Response. Design of FIR Digital Filters Using Window Techniques, Frequency Sampling Technique, Comparison of IIR and FIR Filters, Illustrative Problems

UNIT V

MULTIRATE DIGITAL SIGNAL PROCESSING

Basic Sample Rate Alteration Devices, Multirate Structures for Sampling Rate Converters, Multistage Design of Decimator and Interpolator, Polyphase Decomposition, Nyquist Filters. Spectral Analysis of Nonstationary Signals, Musical Sound Processing, Signal Compression, Transmultiplexers, Discrete Multitone Transmission of Digital Data.

Text Books:

1. *Digital signal processing, principles, Algorithms and applications: John G. Proakis, Dimitris G. Manolakis, Pearson Education/PHI, 2007.*
2. *Digital signal processing , A computer base approach- Sanjit K Mitra, Tata McGraw Hill, 3rd edition, 2009.*

Reference Books*:*

1. *Digital signal processing: Andreas Antoniou, TATA McGraw Hill, 2006.*
2. *A Text book on Digital Signal processing – R S Kaler, M Kulkarni, Umesh Gupta, I K International Publishing House Pvt. Ltd., 2009.*
3. *Digital signal processing: M H Hayes, Schaum's outlines, TATA Mc-Graw Hill, 2007.*

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(13A02703) HVDC TRANSMISSION

Course Objective:

This subject gives the fundamental concepts of High Voltage Direct current. It mainly concentrates on converter configuration and analysis for the application of high voltage transmission system.

UNIT I

INTRODUCTION TO HVDC TRANSMISSION

HVDC Transmission: Technical And Economical Comparision of HVAC ond HVDC Transmission, Types of DC Links,Power Handling Capabilities of HVDC Lines, Basic Conversion Principles, Static Converter Configuration.

UNIT II

STATIC POWER CONVERTER ANALYSIS

Static Power Converters: 3 Pulse, 6 Pulse & 12 Pulse Converters, Converter Station and Terminal Equipment Commutation Process, Rectifier and Inverter Operation, Equivalent Circuit for Rectifier,Inverter and HVDC Link- Special Features of Converters.

UNIT III

CONTROL OF HVDC CONVERTER SYSTEMS

Control of HVDC Converter Systems: Principle of DC Link Control – Constant Current, Constant Extinction Angle and Constant Ignition Angle Control and Voltage Dependent Current Control.Individual Phase Control and Equidistant Firing Angle Control

UNIT IV

HARMONICS AND FILTERS

Origin of Harmonics in HVDC Systems, Classification of Harmonics, Harmonics Elimination, Suppression Methods, Harmonic Instability Problems, Design of HVDC AC & DC Filters etc.

UNIT V

TRANSIENTS, FAULTS AND PROTECTION OF HVDC SYSTEMS

Origin of over Voltages in HVDC Systems, Over Voltages due to DC and AC Side Line Faults - Converter Faults, Over Current Protection- Valve Group and DC Line Protection. Over Voltage Protection of Converters, Surge Arresters etc.

Text Books:

1. K.R.Padiyar, High Voltage Direct current Transmission, Wiley Eastern Ltd, 1993.
2. S.kamaksaiah, V.Kamaraju Mc Graw hill company ,2011.

Reference Books:

1. E.Uhlamann, Power Transmission by Direct Current Springer-Verlag, Berlin, 1975.
2. S Rao, EHVAC, HVDC Transmission & Distribution Engineering, Khanna Publishers, 2001.

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(13A02704) FLEXIBLE AC TRANSMISSION SYSTEMS

Course Objective:

This subject gives the fundamental concepts of FACTS Devices. It mainly concentrates on reactive Power Compensation by Using Different Types of FACTS Controllers.

UNIT I

CONCEPTS OF FLEXIBLE AC TRANSMISSION SYSTEMS

Transmission line Interconnections, Power flow in parallel lines, Mesh systems, Stability considerations, Relative importance of controllable parameters, Basic types of FACTS controllers, Shunt controllers, Series controllers, Combined shunt and series controllers, Benefits of FACTS.

UNIT II

VOLTAGE AND CURRENT SOURCED CONVERTERS

Concept of Voltage Sourced Converters, Single Phase Full Wave Bridge Converter, Three Phase Full Wave Bridge Converter, Transformer Connections for 12-Pulse Operation, 24 and 48-Pulse Operation, Three Level Voltage Sourced Converter, Pulse Width Modulation (PWM) Converter, Converter Rating, Concept of Current Sourced Converters, Thyristor based converters, Current Sourced Converter with Turn off Devices, Current Sourced –Vs- Voltage Sourced Converters.

UNIT III

STATIC SHUNT COMPENSATORS

Objectives of Shunt Compensation, Midpoint Voltage Regulation for Line Segmentation, End of Line Voltage Support to Prevent Voltage Instability, Improvement of Transient Stability, Power Oscillation Damping, Methods of Controllable VAR Generation, Variable Impedance Type Static Var Generators, Switching Converter Type VAR Generators, Hybrid Var Generators, SVC and STATCOM, Transient Stability Enhancement and Power Oscillation Damping, Comparison Between STATCOM and SVC, V-I, V-Q Characteristics, Response Time.

UNIT IV

STATIC SERIES COMPENSATORS

Objectives of Series Compensation, Voltage Stability, Improvement of Transient Stability, Power Oscillation Damping, Subsynchronous Oscillation Damping, Variable Impedance Type Series Compensators, GTO Thyristor Controlled Type Series Capacitor (GCSC), Thyristor Switched Series Capacitor (TSSC), Thyristor-Controlled Series Capacitor(TCSC), Basic Operating Control Schemes for GCSC, TSSC, and TCSC, Switching Converter Type Series Compensators, The Static Synchronous Series Capacitor(SSSC), Transmitted Power Versus Transmission Angle Characteristic, Control Range and VA Rating, Capability to Provide Real Power Compensation.

UNIT V

POWER FLOW CONTROLLERS

The Unified Power Flow Controller-Basic Operating Principles, Conventional Transmission Control Capabilities, Independent Real and Reactive Power Flow Control. Control Structure, Basic Control System for P and Q Control, Dynamic Performance, The Interline Power Flow Controller (IPFC), Basic Operating Principles and Characteristics, Generalized and Multifunctional FACTS Controllers.

Text Books:

1. *Concepts and Technology of Flexible AC Transmission Systems - Understanding FACTS: Narain G. Hingorani, Laszlo Gyugyi - Standard Publishers Distributors - IEEE Press – First Edition – 2001.*

Reference Books:

1. *Thyristor-Based FACTS Controllers for Electrical Transmission Systems, IEEE Press Series on Power Engineering, R. Mohan Mathur, Rajiv K. Varma, 2002.*
2. *Flexible AC Transmission Systems, Yong Hua Song, Allan T Johns, Published by The Institute of Electrical Engineers, 1999, London, UK.*

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(13A02705) INSTRUMENTATION
(Elective –II)

Course Objective:
Instrumentation is essential in monitoring and analysis of any Physical system and its control. This course deals with different types of transducers, digital voltmeters, oscilloscopes and measurement of non electrical quantities.

UNIT I
CHARACTERISTICS OF SIGNALS AND THEIR REPRESENTATION
Measuring Systems, Performance Characteristics - Static Characteristics, Dynamic Characteristics; Errors in Measurements – Gross Errors, Systematic Errors, Statistical Analysis of Random Errors. Signals and Their Representation: Standard Test, Periodic, Aperiodic, Modulated Signal, Sampled Data, Pulse Modulation and Pulse Code Modulation.

UNIT II
DATA TRANSMISSION , TELEMETRY AND DAS
Methods of Data Transmission – General Telemetry System . Frequency Modulation System (FM), Pulse Modulation (PM), Pulse Amplitude Modulation (PAM), Pulse Code Modulation (PCM) Telemetry. Comparison of FM, PM, PAM and PCM. Analog and Digital Acquisition Systems – Components of Analog DAS – Types of Multiplexing Systems: Time Division and Frequency Division Multiplexing – Digital DAS – Block Diagram — Modern Digital DAS (Block Diagram)

UNIT III
SIGNAL ANALYZERS
Wave Analysers- Frequency Selective Analyzers, Heterodyne, Application of Wave Analyzers- Harmonic Analyzers, Total Harmonic Distortion, Spectrum Analyzers, Basic Spectrum Analyzers, Spectral Displays, Vector Impedance Meter, Q Meter. Peak Reading and RMS Voltmeters Digital Voltmeter-Successive Approximation, Ramp and Integrating Type-Digital Frequency Meter-Digital Multimeter-Digital Tachometer

UNIT IV
TRANSDUCERS
Definition of Transducers, Classification of Transducers, Advantages of Electrical Transducers, Characteristics and Choice of Transducers; Principle Operation of Resistive, Inductive, and Capacitive Transducers; LVDT and its Applications, Strain Gauge and Its Principle of Operation, Guage Factor, Thermistors, Thermocouples, Synchros, Piezo Electric Transducers, Photovoltaic, Photo Conductive Cells, Photo Diodes.

UNIT V
MEASUREMENT OF NON-ELECTRICAL QUANTITIES
Measurement of strain, Gauge Sensitivity, Displacement, Velocity, Angular Velocity, Acceleration, Force, Torque, Temperature, Pressure, Flow, Liquid level.

Text Books:
1. *Transducers and Instrumentation by D.V.S Murthy, Prentice Hall of India, 2004.*
2. *A course in Electrical and Electronic Measurements and Instrumentation, A.K. Sawhney, Dhanpat Rai & Co., 2012.*

Reference Books:

1. Electronic Instrumentation-by H.S.Kalsi Tata MCGraw-Hill Edition, 3/e., 2010.

2. Modern Electronic Instrumentation and Measurement techniques – by A.D Helfrick and W.D.Cooper, Pearson/Prentice Hall of India., 1990.

3. Industrial Instrumentation – Principles and Design by T. R. Padmanabhan, Springer, 3rd reprint, 2009.

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(13A02706) DESIGN OF ELECTRICAL SYSTEMS
(Elective – II)

Course Objective:

This course introduces the procedure for basic design of electrical installations for domestic and industrial applications. And also it concentrate on power system earthing for the protection of electrical devices which are generally used for domestic and industries.This will enable the procedure to maintain the protective system. It also learns the power quality issues and power factor improvement for domestic and industrial applications.

UNIT I
DESIGN ASPECTS & ELECTRICAL INSTALLATIONS IN DOMESTIC BUILDINGS

Role of Statutes in Electrical System Design, Classification of Building Services, Design Aspects of Lighting, Design Aspects of Ventilation, Design Aspects of Climate Control, Design Aspects of Vertical Transportation, Design Aspects of Minor Building Services- Classification, Estimation of Load Requirements, Selection of Type of Wiring, Special Features Applicable for High-Rise Apartment Buildings, Pre-commissioning Tests.

UNIT II
INDUSTRIAL INSTALLATIONS

Classification of Industrial Installation, General Characteristics, Selection of Distribution Architecture, Selection of Transformers and Sub Stations -Short Circuit Studies, Fault Current Calculations, Earthing Design, Selection of Switch Gears: Electrical Protection, Protection of Circuit Elements, Persons & Life stack, Equipment, Electrical Isolation, Switch Gear Control, Switching Devices, Uses, Selective Co-ordination, Circuit Breakers and Their Selection

UNIT III
POWER SYSTEM EARTHING

Introduction, Earthing, Types of System Earthing, Reasons for Grounding/ Earthing, TN System, TT System, IT System, Protective Measures and Protective Devices in IT System, Main Characteristics of Earthing Systems, Selection Criteria for Earthing, Design Considerations of Earting, Measurement of Earth Resistance, Earth Leakage Protection, Neutral Earthing for Generators and Transformers.

UNIT IV
LIGITINING PROTECTION SYSTEMS DESIGN

Introduction to Protection Methods and Risks- Risk Management-Lightening Protection Zones-Design Process-Material Requirement-Design Methods-Rolling Sphere-Mesh Method-Protection Angle Method-Air Terminations-Down Conductors

UNIT V
ENERGY ECONOMICS IN SYSTEM DESIGN

Introduction, Time Value of Money, Single Payment Compound Amount Model (SPCA), Uniform Series Compound Amount Model (USCA), Uniform Series Present Worth Model (USPW), Depreciation, Tax Considerations, After Tax Analysis.

Text Books:

1. *Electrical Systems Design – by M. K. Giridharan, I. K. International Publishing House Pvt. Ltd., 2011.*
2. *Design of Electrical Installations – by Er. V. K. Jain and Er. Amitabh Bajaj, University Science Press.*
3. *Lightening protection Hand book –ERITECH:*
   URL: igs.nigc.ir/STANDS/Book/LIGHTINING-ERITECH.pdf

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(13A04712) COMMUNICATION SYSTEMS
(Elective – II)

Course Objective:
This subject introduce different methods of analog communication and their significance, Digital Communication methods for high bit rate transmission, concepts of source and line coding techniques for enhancing rating of transmission of minimizing the errors in transmission, MAC used in communication systems for enhancing the number of users and various media for digital communication.

UNIT I
ANALOG COMMUNICATION
AM – Frequency spectrum – vector representation – power relations – generation of AM – DSB, DSB/SC, SSB, VSB AM Transmitter & Receiver; FM and PM – frequency spectrum – power relations : NBFM & WBFM, Generation of FM and DM, Amstrong method & Reactance modulations : FM & PM frequency.

UNIT II
DIGITAL COMMUNICATION
Pulse modulations – concepts of sampling and sampling theorems, PAM, PWM, PPM, PTM, quantization and coding: DCM, DM, slope overload error. ADM, DPCM, OOK systems – ASK, FSK, PSK, BSK, QPSK, QAM, MSK, GMSK, applications of Data communication.

UNIT III
SOURCE CODES, LINE CODES & ERROR CONTROL (Qualitative only)
Primary communication – entropy, properties, BSC, BEC, source coding: Shaum, Fao, Huffman coding: noiseless coding theorem, BW – SNR trade off codes: NRZ, RZ, AMI, HDBP, ABQ, MBnB codes: Efficiency of transmissions, error control codes and applications: convolutions & block codes.

UNIT IV
MULTIPLE ACCESS TECHNIQUES
SS&MA techniques: FDMA, TDMA, CDMA, SDMA application in wire and wireless communication: Advantages (merits).

UNIT V
SATELLITE, OPTICAL FIBER – POWERLINE, SCADA
Orbits: types of satellites: frequency used link establishment, MA techniques used in satellite communication, earth station; aperture actuators used in satellite – Intelsat and Insat: fibers – types: sources, detectors used, digital filters, optical link: power line carrier communications: SCADA

Text Books:
1. Taub & Schiling "Principles of communication systems" Tata McGraw hill 2007
2. J.Das "Principles of digital communication" New Age International, 1986

Reference Books:
1. Kennedy and Davis "Electronic communication systems" Tata McGraw hill, 4th edition, 1993.
2. Sklar "Digital communication fundamentals and applications"Pearson Education, 2001.
3. Bary le, Memuschmidt, digital Communication, Kluwer Publication, 2004.
4. B.P.Lathi "Modern digital and analog communication systems" Oxford University Press, 1998.

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(13A02707) AI APPLICATIONS TO ELECTRICAL SYSTEMS
(Elective-II)

Course Objective:
This course deals with various Artificial Intelligent Techniques, i.e., Artificial Neural Networks, Fuzzy Logic and its basic concepts. It also deals with role of ANN and Fuzzy Logic in various Electrical Engineering Applications.

UNIT I
INTRODUCTION TO ARTIFICIAL INTILLEGENCE
Introduction and motivation – Approaches to AI – Architectures of AI – Symbolic Reasoning System – Rule based Systems – Knowledge Representation – Expert Systems.

UNIT II
ARTIFICIAL NEURAL NETWORKS
Basics of ANN - Comparison between Artificial and Biological Neural Networks – Basic Building Blocks of ANN – Artificial Neural Network Terminologies – McCulloch Pitts Neuron Model – Learning Rules – ADALINE and MADALINE Models – Perceptron Networks – Back Propagation Neural Networks – Associative Memories.

UNIT III
ANN APPLICATIONS TO ELECTRICAL SYSTEMS
ANN approach to: Electrical Load Forecasting Problem – System Identification – Control Systems – Pattern Recognition.

UNIT IV
FUZZY LOGIC
Classical Sets – Fuzzy Sets – Fuzzy Properties and Operations – Fuzzy Logic System – Fuzzification – Defuzzification – Membership Functions – Fuzzy Rule base – Fuzzy Logic Controller Design.

UNIT V
FUZZY LOGIC APPLICATIONS TO ELECTRICAL SYSTEMS
Fuzzy Logic Implementation for Induction Motor Control – Power System Control – Automatic Generation Control – Switched Reluctance Motor Control – Modelling and Control of DC Drive – Fuzzy Excitation Control Systems in Power System Stability Analysis - Transient Stability Analysis – Automatic Voltage Regulator - Fuzzy Logic Controller in an 18 Bus Bar System.

Text Books:

1. *S. N. Sivanandam, S. Sumathi and S. N. Deepa, "Introduction to Neural Networks using MATLAB", McGraw Hill Edition, 2006.*
2. *Timothy J. Ross, "Fuzzy Logic with Engineering Applications", Third Edition, WILEY India Edition, 2012.*

Reference Books:

1. *S. N. Sivanandam, S. Sumathi and S. N. Deepa, "Introduction to Fuzzy Logic using MATLAB", Springer International Edition, 2013.*
2. *Yung C. Shin and Chengying Xu, "Intelligent System – Modeling, Optimization & Control, CRC Press, 2009.*

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B.Tech. IV-I Sem. **L** **C**
3 **2**

(13A04605) MICROPROCESSORS & MICROCONTROLLERS LAB

***Course Objective*:**

- To become skilled in 8086 Assembly Language programming.
- To understand programmable peripheral devices and their Interfacing.
- To understand and learn 8051 microcontroller.
- To learn 8051 assembly Language programming

***Learning Outcome*:**

- Able to write 8086 Assembly Language programs.
- Able to understand programmable peripheral devices and their Interfacing.
- Able to write 8051 assembly Language programs.

Minimum **Ten** Experiments to be conducted (**Five** from each section)

I) 8086 Microprocessor Programs using MASM/8086 kit.

1. Introduction to MASM Programming.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Length of the string, String comparison.

Interfacing:

1. 8259 – Interrupt Controller and its interfacing programs
2. 8255 – PPI and its interfacing programs (A /D, D/A, stepper motor,)
3. 7-Segment Display.

II) Microcontroller 8051 Trainer kit

1. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation.
2. Logic operations – Shift and rotate.
3. Sorting- Ascending and descending order.

Interfacing using 8051 Trainer kit:

1. Key board Interfacing
2. Seven Segment display
3. Switch Interfacing
4. Relay Interfacing
5. UART

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(13A02708) POWER ELECTRONICS AND SIMULATION LAB

Any Eight of the Experiments in Power Electronics Lab

1. Study of Characteristics of SCR, MOSFET & IGBT
2. Gate Firing Circuits for SCR's
3. Single Phase AC Voltage Controller with R and RL Loads
4. Single Phase Fully Controlled Bridge Converter with R and RL Loads
5. Forced Commutation Circuits (Class A, Class B, Class C, and Class D & Class E)
6. DC Jones Chopper with R And RL Loads
7. Single Phase Parallel, Inverter with R And RL Loads
8. Single Phase Cycloconverter with R and RL Loads
9. Single Phase Half Controlled Converter with R Load
10. Three Phase Half Controlled Bridge Converter with R-Load
11. Single Phase Series Inverter with R And RL Loads
12. Single Phase Bridge Converter with R And RL Loads
13. Single Phase Dual Converter with RL Loads

Any Two Simulation Experiments With PSPICE/PSIM

PSPICE Simulation of Single-Phase Full Converter Using RLE Loads and Single-Phase AC Voltage Controller Using RLE Loads

PSPICE Simulation of Resonant Pulse Commutation Circuit and Buck Chopper

PSPICE Simulation of Single Phase Inverter with PWM Control

References:

1. Simulation of Electric and Electronic circuits using PSPICE – by M.H.Rashid, PHI.
2. PSPICE A/D user's manual – Microsim, USA.
3. PSPICE reference guide – Microsim, USA.
4. MATLAB and its Tool Books user's manual and – Mathworks, USA.