

International Research, Education and Training Center NGO (R/C 80550594)
Rahvusvaheline teadus-, haridus- ja koolituskeskus MTÜ
Non-Profit Organization / Mittetulundusühing

TRAINING PROGRAM

FOR ELECTRICAL AND ELECTRONIC ENGINEERING

EHVE-ELECTRICAL HIGH VOLTAGE ENGINEERING-01
EMVE-ELECTRICAL MEDIUM VOLTAGE ENGINEERING-02
ELVE-ELECTRICAL LOW VOLTAGE ENGINEERING-03

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01016- Electric Power Distribution Systems Design and Installation
01017-Electrical Design of Overhead Power Transmission Lines and Installation
01018-Electrical Grounding, Surge and Lightning Protection.
01019-Power Distribution Systems. Smart Grid
01020-Maintenance and Troubleshooting of UPS Systems
01021- Electric Motors and Variable Speed Drives
01022- Electrical Distribution Principles and Applications
01023- Power Compensation Control Strategy and Modelling
01024- Supervisory Control and Data Acquisition-SCADA Systems
01025- Partial Discharge Detectors & Testing
01026-Reactive Power Management and Power Factor Correction
01027- Theory and Application of Industrial Electronics
01028- Overhead Lines, Maintenance and Construction
01029- Construction & Design of Overhead Transmission Lines
01030- Cable Termination & Wire Connectors
01031- Load Flow or Power Flow Analysis
01032- Design and Optimization of Overhead Transmission Lines
01033- High Voltage Electrical Safety
01034-Instrumentation, Controls and Electrical Systems for Facilities Engineers
01035- Distributed Control Systems DCS Programming Essentials
01036-Design & Development of Isolated DC to DC Converters (7 Days)
01037- Air Circuit Breaker Construction and Operation
01038- Troubleshooting Printed Circuit Boards, Design, Implementation
01039- Electrical Protection Devices: Construction & Maintenance
01040-Diesel Generator: Operation and Maintenance
01041- Power System Control and Protection
01042-CYMGRD-Grounding Grid Analysis
01043-Industrial Electronics Maintenance Skills
01044-Arc Flash Analysis and Prevention Techniques
01045- Electrical Insulators Specifications
01046- Transmission Lines Operations, Protection and Maintenance
01047-Power Plant Operations and Maintenance
01048-Switchgear and Circuit Breakers
01049-Basic Instrumentation For Process Operators
01050-Digital Image Processing Using MATLAB (DIP)
01051-Introduction to Digital Filters with Audio Applications

01010 Electrical Circuits Fundamentals

Course Description

The Fundamentals of Electric Circuits course provides the participants with an understanding of the concepts and techniques in the characterization of electrical circuits and their components. This course introduces the participants to the basic concepts of current, voltage, power, electromagnetism, basic laws and theorems for the analysis of electric circuits. Pulse-response and resonance are also covered.

Course Objectives

Understanding fundamental circuit analysis techniques
Being familiar with circuit equivalence and modeling
Being able to develop physical insight and intuition for problem solving
Learning how to different simulators

Who Should Attend?

- ✓ Maintenance supervisors
- ✓ Plant engineers
- ✓ Electricians
- ✓ Plant mechanics
- ✓ Service technicians
- ✓ Contractors
- ✓ Energy auditors
- ✓ Layout professionals

Course Details/Schedule

Day 1

- Units and notation, basic electric quantities
- Electric signals and circuits
- Kirchhoff's laws
- Circuit elements and sources
- Resistance, series and parallel combinations
- Basic resistive circuits
- Practical sources and loading
- Introduction to digital circuits simulators

Day 2

- Circuit solution by inspection

- Nodal analysis
- Loop analysis
- The superposition principle
- Source transformations
- One-ports
- Circuit theorems
- Circuit theorem applications

Day 3

- Power calculations (using computer programs)
- Dependent sources
- Circuit analysis with dependent sources
- The ideal transformer
- Amplifier concepts (using computer programs)
- The operational amplifier, the Op amp rule
- Summing and difference amplifiers

Day 4

- Instrumentation amplifiers and I-V converters
- V-I converters, current amps (using computer programs)
- Capacitance and inductance
- Natural response
- Response to DC and AC forcing functions
- Basic RC and RL circuits
- Transients in First-Order networks
- RC circuits using Op amps (using computer programs)
- Sinusoids and phasors

Day 5

- AC responses of the basic elements
- Time-domain analysis of first-order AC circuits
- Phasor algebra
- Phasor algebra applications
- AC impedance
- Frequency-domain analysis
- AC circuits using Op Amps (using computer programs)
- AC power and maximum power transfer

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