



**DEPARTMENT OF ELECTRICAL ENGINEERING
C.V.RAMAN COLLEGE OF ENGINEERING**



Training Modules (Session-2012-16)

Semester	Hours	Compulsory Course-I	Compulsory Course-II
3 rd	45	Industrial Automation-I (20 hrs.)	TIA/Scada Siemens (25hrs)
4 th	45	Industrial Automation-I (20 hrs.)	DCS Siemens (25hrs)
5 th	65	Industrial Automation-II (35 hrs.)	AC/DC Drives (30hrs)
7 th	65	Industrial Automation-III (35 hrs.)	LV Switch Gear (30hrs)

INDUSTRIAL AUTOMATION

COURSE OBJECTIVES:

- Making participants familiar / work with Drive (Hydraulics & Pneumatics) & / Electronics) Technology of Industrial related Applications.
- Making participants to know more on Drive & Control specific to their in these areas related to different industrial segments.
- Share experience with the group.
- The Trainees will find this training ideal for optimum use of equipments.

TEACHING AND LEARNING MEDIA:

- Multimedia presentation
- Sample units and power units
- Cut Sections & Transparent Models
- PC animations
- Circuits Simulation on trainer kit
- Circuits Simulation on Automation Simulation Software



Training Modules

Industrial Automation-I (40 hrs.)

- Hydraulics
- Pneumatics

Industrial Automation-II (35 hrs.)

- Electro Hydraulics
- Electro Pneumatics
- Mobile Hydraulics
- Proportional Hydraulics

Industrial Automation-III (35 hrs.)

- Sensorics
- Robotics
- Mechatronics
- Conventional Machining
- CNC Machining
- FMS
- EDM
- Metrology

SIEMENS CENTRE OF EXCELLENCE

COURSE: Totally Integrated Automation with SIMATIC S7 300 and STEP 7

DURATION: 25 Hours

OBJECTIVE:

Making participants familiar / work with , STEP 7 programming software and SIMATIC S7- 300 PLC, Programming for centralized I/Os and remote I/Os on Profibus DP network (ET200M), Control of Drive from PLC on a Profibus DP network, Communication between CPU & OP / TP on MPI network , Configuring OP / TP using WinCC Flexible software and integrating with SIMATIC Manager.

TARGET GROUP

Users, Commissioning / Service /Maintenance Engineers

TRAINING METHODOLOGY:

Explanation, demonstration and hands-on practice

REQUIREMENTS

Basic knowledge of Electrical Engineering.

COURSE CONTENTS:

STEP 7 with SIMATIC S7-300 PLC



- Basic constituents of PLC
- Signal modules, CPU, Power Supply, mounting rail and MMC.
- How PLC works?
- Overview of SIMATIC S7 – PLC.
- Hardware details of S7-300 PLC including front indications, terminals, and ports on the module.
- Installation guide lines Installation, powering and wiring of modules with information on addressing.
- Programming language and representation in STL, FBD and LAD
- Programming Units and using PC as Programming Unit
- Hardware Configuration and setting object Properties of Modules in STEP-7
- Step 7 Instructions and programming: AND, OR, AND-before-OR, OR-before- AND, NO / NC contacts Edge detection instructions.
- Set / Reset, Elementary data type, Load / Transfer, Comparison, Timer, basic math instructions.
- Using Symbol Table and VAT.
- STEP 7 blocks and structured programming
- Using Data Blocks.
- Using Function Block – single instance.
- Use of Organization Blocks.
- Analog signal processing.
- Project archiving/retrieving.Using Reference Data i.e. Program Structure, Cross Reference List, I/Q/M List
- Timers List
- System and functional fault diagnostics using facilities available in STEP 7.
- Using facilities like Force and Rewiring.

SIMATIC NET

- Overview of various networking and communication options.
- Remote I/Os Communication on Profibus – DP with ET200M (using integrated DP port of CPU).
- Control of Drive by PLC on a Profibus DP network.
- Fault diagnostics.

WinCC Flexible with OP / TP

- Overview of Operator Panel, Touch Panel and WinCC Flexible software
- Creating a project and integration with SIMATIC Manager
- Graphic display creation.



COURSE: SIMATIC PCS-7 (DCS)

DURATION: 25 Hours

OBJECTIVE:

Making participants familiar with SIMATIC PCS 7 System

TARGET GROUP

Engineers working in DCS controlled plant having knowledge in the area of process automation

TRAINING METHODOLOGY:

Explanation, demonstration and hands-on practice

REQUIREMENTS

Basic knowledge of PLC.

COURSE CONTENTS:

- Introduction to standard architecture of PCS 7.
- Introduction to AS Hardware.
- Working with SIMATIC Manager.
- Creating the project and Configuring Hardware (AS & OS).
- Working with Plant Hierarchy.
- Working with CFC Charts and develop logic using CFC charts.
- Working with SFC Charts and develop sequences using SFC charts.
- Various control modes available with SFC charts.
- Compiling, downloading & testing CFC & SFC charts.
- Compiling Operator Station. Creating process pictures in Graphics editor.
- User interface in Process Control mode. Working with standard faceplates.
- Messages and Trends.
- User Administration.
- Licensing Concept.

COURSE: AC/DC Drives

DURATION: 30 Hours

OBJECTIVE

The participants:

- will have a basic or fundamental knowledge of various DC/AC Variable speed drives (Excluding servo-drives & high end applications like machine tools etc).



- will know about the product specifications, range, hardware / constructional details and features of the product.
- will be able to perform drive start-up and parameterize drive for different configurations including use of programmable digital and analog inputs and outputs.

TRAINING METHODOLOGY:

Explanation, demonstration and hands-on practice

COURSE CONTENTS:

- Brief Basic Power Electronics (including Thyristors, Power-Transistors & IGBTs).
- DC Motor Basics (construction, principle of operation, T-N Characteristic etc).
- DC Drives Basics (Block diagram, 1Q-4Q principle of operation, T-N Curves etc)
- Selections, Calculations & applications of typical DC drives.
- Siemens DC Drives (6RA70) - Ratings, Specs, features, options & applications.
- AC Motor Basics (construction, principle of operation, T-N Characteristic etc).
- AC Drives Basics (Block diagram, 1Q-4Q principle of operation, T-N Curves etc)
- Selections, Calculations & applications of typical DC drives.
- AC Drives (Micromaster-MM4): Ratings, Specs, features, options & applications.
- AC Drives (Master Drive-VC): Ratings, Specs, features, options & applications.
- AC Drives (Sinamics-G): Ratings, Specs, features, options & applications in brief.
- MEDIUM VOLTAGE (MV Drives & Motors) :
 - MV Motor types & Fundamentals (including starting methods, options/features)
 - MV Motor offers from Germany (separately for Induction & Synchronous Motor)
 - MV Converter Basics & types (Voltage, Current Source & Cyclo-converters)
 - Siemens MV Converters (Sinamics GM, Simovert-S and Perfect Harmony)
 - Selection, configuration & Applications of MV Drive systems
- Short briefing on MV Transformers along with their options & protections.
- Examination on both Theory & Practical

COURSE: LV Switch gear

DURATION: 30 Hours

OBJECTIVE:

Siemens has a lot to offer in the field of low-voltage control gear and switchgear.

This course provides you with a comprehensive overview of our technology and applications. It also covers the maintenance aspects of our standard products.



TARGET GROUP

Customers, personnel in project planning, design, installation, customer support, workshops, test bay, maintenance, personnel in the electrical wholesale trade and those generally interested in technology.

TRAINING METHODOLOGY:

Explanation, demonstration and hands-on practice

REQUIREMENTS

Basic knowledge of Electrical engineering.

COURSE CONTENTS:

- ACBs (3WT and 3 WL) - Basics, ETU settings , Hands On practice required for maintenance,
- MCCBs (3VL and 3VT) - Basics, ETU settings, Hands On practice required for maintenance.
- Contactors, Birelays, Electronic relays, MPCBs, Sirius series.
- SDFs, Fuses, PAC Monitor.
- Introduction of Soft starter and Simocode.
- Basic principles, construction and functions, selectivity, back-up protection, switching duties, protection classes
- Working with the catalog
- Benefits for the customer, applications and solutions
- Accessory fittings and hands-on training
- Maintenance methods

For feedback and suggestion please write to trainingfeedback@cvmgi.edu.in

