

Electrical & Instrumentation Drafting and Modeling

Module1: Fundamental of Electrical & Instrumentation Drawings and Layouts Engineering

- Overview of EPC Industries and Scopes.
- Overview of Basic Engineering Packages.
- Designing Methodology of EPC Industry.
- Overview of an Engineering Organization.
- Role of Designers in various Industries.
- Basic Design Requirement Based on Petro-chemical, Oil & Gas, Refineries, Pharmaceutical, Power Plant, Steel Plant, Cement Plant etc.

Module2: Introduction to Electrical & Instrumentation Drawings and Layouts

- The role of plant documentation, standards and specifications Drawing Types and Standards
- Standards organizations (ISA, IEC, ISO)
- Understanding diagram layouts and formats
- Cross references
- ISO 9002 and document control
- Specification forms – ISA S20 –specification forms for process measurement Component Fundamentals
- Drawing Management - Revision control and Redlining in drawing .

Module3: Electrical & Instrumentation 2D Drafting

- Instrumentation Symbols and Identification [**ISA 5.1**]
- Instrument Loop Diagrams[**ISA S5.4**]
- Plant layout fundamental & work flow Procedures.
- Single Line Diagram Preparation.
- Earthing & Lightening Layout
- Substation Layout & Equipment
- Loop & Hookups.
- JB Layouts.
- Cable Tray & Routing.
- Electrical Trenches.
- Level Sketches.
- Field Wiring diagrams.
- Plot Plan & Key Plan.
- Plant Location Layout.
- Control Room Layout.
- Instrument Air Routing Diagram.

Module4: Electrical & Instrumentation 3D Modeling

- Introduction of Advanced Modeling
 - Overview of 3D Models.
 - Design & Modeling consideration.
 - Types of Modeling & Review.
 - Terminology & Symbols used in plant modeling.
 - Overview of Plot Plan ,Elevation & 3D models.
 - Design Review Integrator.
- Equipment Modeling
 - Understanding of universal direction, Plant direction & Orientations.
 - Creation of Equipment understanding of parametric & primitives method.
 - Creation of Equipment by using modeling standard catalog/datasheet.
 - Creation of Civil foundation & possible Clashes with their remedies.
 - Manipulation of primitives & equipment as per client or codes requirement.
 - Datum point manipulation& Nozzle placement/Elevation in case of changed piping or equipment location.
 - Understanding modeling parameter & Attributes.
 - Modeling of offline Items.
 - DB Utility & Tools.
- Electrical/Instrument Modeling
 - Plant Location Plan Review
 - Client model Review.
 - JB Modeling.
 - Cable Creation & Routing.
 - Branch Cabling & Clashes.
 - Cable Tray Layout
 - Supports, Anchor, sleepers.
 - Electrical Raceways.
 - Conduit Modeling.
 - Checking Data Consistency.
 - Component Manipulating & Assemblies.