



شركة ميرك العربية السعودية  
MEIRC Saudi Arabia

## Process Analyzer System)

### **Duration 5 Days**

### **Introduction**

To introduce to instrument & electronic engineers and technicians the principles and applications of on line process analyzers in plants.

### **Who Should Attend**

- Unit, Instrument or Field Service Technicians
- Process Technicians and Engineers

### **Course Objectives:**

**To introduce to instrument & electronic engineers and technicians the principles and applications of on line process analyzers in plants.**

### **Course Outlines:**

#### **1- Introduction:**

- What is process analyzers?
- How is it different from lab analyzers?
- How is it different from other process measurements ?
- Benefits of process analyses to
  - Plant efficiency
  - Personnel safety
  - Environment
- Analyzers selection & organization
  - Quantitative or qualitative
  - What parameter is being measured
  - How the sample is accessed
  - Use of output
  - Method of analysis

#### **2- Photometric analyzers**

- Infrared photometry
- Ultraviolet and visible photometry
- Instrumentation
- Photometric analyzer geometries
- Applications

#### **3- Gas Chromatography**

- Introduction
- Instrumentation
- Theory
- Capillary columns
- Applications

#### **4- Liquid chromatography**

- Instrumentation
- Theory,
- Types of HPLC
- Applications

#### **5- Electrochemical process analyzers**

- Potentiometry
- Coulometry
- Amperometry



- Conductivity
- Automatic titrators
- 6- Oxygen analyzers**
  - Paramagnetic oxygen analyzers
  - Electrochemical oxygen analyzers
  - Oxygen analyzer applications
- 7- Process mass spectrometry**
  - Theory
  - Instrumentation
  - Applications
- 8- Water quality monitoring**
  - Chlorine
  - Silica
  - Boiler feed water and steam condensate
  - Turbidity
  - Total organic carbon
  - Dissolved oxygen
  - Hardness
  - Hydrocarbons
- 9- Air quality analyzers**
  - Photometric analyzers
  - Electrochemical analyzers
  - Chromatographic analyzers
- 10- Moisture analysis**
  - Aluminum oxide sensors
  - Phosphorus pentoxide sensors
  - Photometric moisture analysis
  - Corrosion monitors
  - Oscillating crystals
  - Applications
- 11- Physical properties**
  - Density, 212
  - Index of refraction
  - Viscosity
  - Dielectric constant
  - Thermal conductivity
  - Extrinsic physical properties
- 12- Sample systems**
  - Sample system components
  - General characteristics of sample systems
  - Application
- 13- Project Engineering and Management**
  - Analyzer project management
  - Engineering economics
  - Process control
  - Materials of construction
  - Site preparation and utilities
  - Process analyzer record-keeping
  - Process analyzer maintenance,
  - Vendor relations
  - Engineering consultants
  - Technological advancements