Career Management Consultants & Training Est.

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IE161:
Analyzer Communications

Training Description:

This intensive training course is designed to introduce participants to fundamentals of communication networks, to review various types of communication protocols and to help participants develop a better understanding of how this information is used to maintain and troubleshoot the equipment. It covers the basics of digital systems including binary and hexadecimal number system; the logic gates, flipflops, generating clock signal, input and output units; and the CPU and memory devices covering RAMs, ROMs, EEPROMs, registers, flags and types of CPUs.

During this interactive course, participants will learn the data transfer between CPU and its peripherals pertaining to serial and parallel communication, data bus, address bus and control bus; the basics of digital communications and ethernet communications; the layers of ethernet communications covering physical l, datalink, IP, transport and application layer; the IP packet handling; and the network devices and TCP/IP over wireless.

Training Objectives:

By the end of the training, participants will be able to:
- ✓ Apply and gain a comprehensive knowledge on analyzer communications
- ✓ Recognize the basics of digital systems covering binary and hexadecimal number system
- ✓ Identify logic components including logic gates, flip-flops, generating clock signal, input and output units
- ✓ Enumerate CPU and memory devices covering RAMs, ROMs, EEPROMs, registers, flags and types of CPUs
- ✓ Explain data transfer between CPU and its peripherals pertaining to serial and parallel communication, data bus, address bus and control bus
- ✓ Discuss the basics of digital communications and ethernet communications
- ✓ Illustrate layers of ethernet communications covering physical l, datalink, IP, transport and application layer
- ✓ Employ IP packet handling as well as recognize network devices and TCP/IP over wireless

Training Designed for:

This course is intended for a broad audience including asset owners from process, power and other critical infrastructures, control systems engineers, operators, information and security officers and vendors, as well as security experts from government, industry associations and academia. Further, the course is beneficial for those who are seeking a better understanding in the concept, design and operation of the communication systems commonly used today for many process analyzer systems.

Training Program:

DAY ONE:
- ❖ Pre-Test
- ❖ Introduction
- ❖ **Basics of Digital Systems**
  - ● Binary Number System
  - ● Hexadecimal Number System

❖ Logic Components
- ● Logic Gates
- ● Flip-Flops
- ● Generating Clock Signals
- ● Input and Output Units

❖ Recap

DAY TWO:

❖ CPU & Memory Devices
- ● RAMs
- ● ROMs
- ● EEPROMs
- ● Registers
- ● Flags
- ● Types of CPUs

❖ Data Transfer between CPU & its Peripherals
- ● Serial Communication
- ● Parallel Communication
- ● Data Bus
- ● Address Bus
- ● Control Bus

❖ Recap

DAY THREE:

❖ Basics of Digital Communications
- ● RS-232 Standart
- ● Cables and Connectors for RS-232
- ● Signalling Standarts for RS-232
- ● RS-485 Standart
- ● Cables & Connectors for RS-485
- ● Signalling Standarts for RS-485

❖ Ethernet Communications
- ● Basics of TCP/IP
- ● TCP/IP over Copper Cables
- ● TCP/IP over Fiber Cables

❖ Recap

DAY FOUR:

❖ Layers of Ethernet Communications
- ● Physical Layer
- ● Datalink Layer
- ● IP Layer
- ● Transport & Application Layer

❖ IP Packet Handling
- ● Data Link Frames

- IP Packets
- IP Adressing
- IP Masks & Network Segmentation
❖ Recap

DAY FIVE:
❖ Network Devices
- Hubs
- Layer-2 Switches
- Layer-3 Switches
- Routers
❖ TCP/IP Over Wireless
- 802.11x protocols
- Access Points
- Modulation Types
❖ Course Conclusion
❖ Post-Test and Evaluation

Training Requirement:

"**Hand's on practical sessions, equipment** and **software** will be applied during the course if required and as per the client's request".

Please note that the above topics can be amended as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

As per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Training Timings:

Daily Timings:
07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

For training registrations or in-house enquiries, please contact:
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Training & Career Development Department