COURSE OVERVIEW IE0667

Certified Automation Professional (CAP)

(ISA Exam Preparation Training)

Course Title

Certified Automation Professional (CAP)
(ISA Exam Preparation Training)

Course Date/Venue

December 08-12, 2024/ Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference

IE0667

Course Duration/Credits

Five days/3.25 CEUs/32.5 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Certified Automation Professional (CAP). It covers the preliminary scope, work practices and cost/benefit analysis of automation alternatives; the technical studies for the preliminary automation strategy and justification analyses; the conceptual summary document; the system and process operational strategies; the alternative technical solutions, detailed requirements, data and focused project cost estimates; the basis-of-design, user requirements, hazard analyses, security analyses and regulatory compliance assessments; the customer design criterial, preferences, quantity, type and flow of data; and the detailed equipment specifications and instrument data sheets.

Further, the course will also discuss the physical communication media, network architecture and protocols; the functional description of the automation solution; the designing of test plan and choses methodologies; the detailed design for the project; and the control configuration or programming, human machine interface (HMI), database and reporting function in accordance with the design documents.

During this interactive course, participants will learn the data transfer methodology; the peer reviews of configuration and programming; the offline or FAT testing of automation systems; the required documentation and user manuals created during the development process; the physical inspection process of installed equipment against construction drawings; the site acceptance testing of communication systems and field devices; the testing of safety elements, systems and security features; the operational tests, troubleshooting and resolving of problems identified during installation and testing; the periodic systems, component inspection protocols and technical support for facility personnel; the training needs analysis, training goals and measurable outcomes; the monitoring of performance using software and hardware diagnostic tools; and the continuous improvement by working with facility personnel.

Course Structure

This certification course comprises of two training modules. The first module is a 5-day exam preparation training designed by Haward Technology. This face-to-face (F2F) instructor-led training will provide participants with 30 professional development units or 30 tuition hours of training.

The second module is an e-learning course designed by ISA where participant will register and achieve their training in their own self pace. This training module end up with a competency exam that certify those who pass as a Certified Automation Professional (CAP). Participant shall complete this e-learning module within 4 weeks.

During the e-learning module, the instructor will be available 2 hours per week for 4 consecutive weeks on MS-Teams to answer participants questions and support them in their self-pace study.

Exam Eligibility & Structure

Exam candidates shall have the following minimum pre-requisites:-

- To become an ISA CAP, you must meet the education and work experience requirement and pass an exam. You will be eligible to sit for the exam when you have met the criteria listed below. Please ensure you meet these requirements when you are prompted to self-certify during the exam fee checkout process

    1. You agree to commit to the ISA Code of Ethics
    2. You meet the education and work experience requirements outlines in either I or II below
    3. You acknowledged that you may be randomly chosen for an audit and will need to provide supporting documentation for number 2 above

- Education and Work Experience Requirements

I. If you hold a 4 year technical degree:-

- **Evidence of technical degree**-Four-year academic degree from an accredited educational institution in a technical or technology field including engineering, chemistry, physics, math, etc
- **Related work experience**-Related experience means a minimum of five years of work in the automation field. One (1) year of work experience means 1,500 hours of active employment. A cumulative total of 7,500 hours of documented work experience is required during the five-year period prior to your application date. Passing the CAP Associate Certificate program exam counts as one (1) year of work experience

II. If you hold a 2 year degree or do not have a degree: -

- **Related work experience**-Related experience means a minimum of ten (10) years of work in the automation field. One (1) year of work experience means 1,500 hours of active employment. A cumulative total of 15,000 hours of documented work experience is required during the ten (10) year period prior to your application date. An Associate Degree in automation or related technology from an accredited educational institution will count as two (2) years of work experience
- **Evidence of responsible charge position-**Two (2) work related references should be submitted that demonstrates that the applicant has had at least two (2) years experience in automation in a position of responsible charge. Each reference should be completed and signed by a former supervisor or someone who is in a to attest to the applicant's responsibilities. At least one of the references must be signed by a current or former supervisor.
  Responsible charge does not refer to management control or administrative functions such as accounting, labor relations, or marketing. The span of control necessary to be considered in a position of responsible charge includes:
  - Personally makes critical automation projects decisions, or reviews and approves proposed decisions prior to implementation, including consideration of alternatives.

  OR
  - Judges the quality of other technical specialists and the validity and applicability of their recommendations before such recommendations are incorporated in the work

Work experience and educational periods may not overlap when compiling the total number of years required for this certification.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Get prepared for the next CAP exam and have enough knowledge and skills to pass such exam in order to get the CAP certification from the International Society of Automation (ISA)s
- Define the preliminary scope through currently establish work practices and perform and document cost/benefit analysis of automation alternatives
- Conduct technical studies for the preliminary automation strategy and perform justification analyses by generating cost estimates
- Create a conceptual summary document to solicit stakeholder "buy-in"
- Develop system and process operational strategies through discussion with key stakeholders and use appropriate documentation
- Analyze alternative technical solutions, establish detailed requirements and data and generate focused project cost estimates
- Create basis-of-design and user requirements, perform safety and/or hazard analyses, security analyses and regulatory compliance assessments
- Analyze customer design criterial, preferences, quantity, type and flow of data involved with automation systems as well as create detailed equipment specifications and instrument data sheets

- Select the physical communication media, network architecture and protocols and develop a functional description of the automation solution using rules established in the definition stage
- Design the test plan using chosen methodologies and perform the detailed design for the project
- Develop control configuration or programming, human machine interface (HMI), database and reporting function in accordance with the design documents
- Implement data transfer methodology using communications and network protocols including automation system security in accordance with the design documents
- Conduct peer reviews of configuration and programming as well as offline or FAT testing of automation systems using the test plan
- Assemble all required documentation and user manuals created during the development process as well as review and/or perform the physical inspection process of installed equipment against construction drawings
- Conduct site acceptance testing of communication systems and field devices and test safety elements, systems and security features by executing test plans
- Execute operational tests as well as troubleshoot and resolve problems identified during installation and testing
- Develop and conduct periodic systems and component inspection protocols and provide technical support for facility personnel
- Perform training needs analysis, establish training goals and measurable outcomes and monitor performance using software and hardware diagnostic tools including continuous improvement by working with facility personnel

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course is essential for those who desire to reinforce their skills, knowledge and capacity to understand the certified automation professional of the organizational excellence body of knowledge in preparation for taking ISA certified automation professional examination.

Training Methodology

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

30% Lectures
20% Workshops & Work Presentations
30% Case Studies & Practical Exercises
20% Software, Simulators & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 6,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.25 CEUs** (Continuing Education Units) or **32.5 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

- British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Sydney Thoresson, PE, BSc, is a **Senior Electrical & Instrumentation Engineer** with over **40 years** of extensive experience within the **Petrochemical**, **Utilities**, **Oil**, **Gas** and **Power** industries. His specialization highly evolves in Electrical **Load Calculation and Design**, **Automation Opportunity Identification Techniques**, **Automation Systems Technology**, **Electrical Safety**, **Power System Equipment**, **Electrical Drawing**, **Electrical Forecasting**, **Transmission Networks**, **Substation**, **Distribution Networks**, **Substation Automation Systems & Application**, **Electrical** System, **HV/LV Electrical** Authorisation, **Variable Frequency Drives** (VFD), **HV/LV Equipment**, **Circuit Breaker**, **Motor Controllers**, **Hazardous Area Classification**, **Intrinsic Safety**, **Electrical Power Systems** Quality & Troubleshooting, **Protection & Relay**, **Electric & Control** System Commissioning, **Liquid & Gas Flowmetering**, Fault Analysis in **Electrical Networks & Distribution Cables**, **Custody Measurement**, **Ultrasonic Flowmetering**, **Loss Control**, **Gas Measurement**, **Process Control Instrumentation**, **Compressor Control & Protection**, **Control Systems**, Programmable Logic Controllers (**PLC**), **SCADA**, Distributed Control Systems (**DCS**) especially in **Honeywell DCS**, **H&B DCS**, **Modicon, Siemens**, **Telemecanique**, **Wonderware** and **Adrioit**. Moreover, he has vast experience in the field of Safety Instrumented Systems (**SIS**), Safety Integrity Level (**SIL**), Emergency Shutdown (**ESD**), **Flowmetering & Custody Measurement**, **Multiphase Flowmetering**, **Measurement and Control**, **Mass Measuring System Batching** (**Philips**), Arc Furnace Automation-Ferro Alloys, Walking Beam Furnace, Blast Furnace, Billet Casting Station, Cement Kiln Automation, Factory Automation and Quality Assurance Accreditation (**ISO 9000** and **Standard BS 5750**).

During Mr. Thoresson's career life, he has gained his thorough and practical experience through various challenging positions such as a **Project Manager**, **Contracts Manager**, **Managing Director**, **Technical Director**, **Divisional Manager**, **Plant Automation Engineer**, **Senior Consulting Engineer**, **Senior Systems Engineer**, **Consulting Engineer**, **Service Engineer** and **Section Leader** from several international companies such as **Philips**, **FEDMIS**, **AEG**, **DAVY International**, **BOSCH** Instrumentation and Control, **Billiton**, **Endress/Hauser**, **Petronet**, **Iscor**, **Spoornet**, **Eskom** and **Afrox**.

Mr. Thoresson is a **Registered Professional Engineering Technologist** and has a **National Higher Diploma** (**NHD**) & a **National Diploma** in **Radio Engineering** from the **Witwatersrand Technikon**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**), an active member of the International Society of Automation (**ISA**) and the Society for Automation, Instrumentation, Measurement and Control (**SAIMC**).

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: ***Sunday, 8th of December 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 - 0845	***Domain 1 Feasibility Study: Define the Preliminary Scope through currently Established Work Practices in Order to Meet the Business Needs*** *Automating Process and/or Equipment • Automation Opportunity Identification Techniques (e.g., Dynamic Performance Measures) • Basic Process and/or Equipment • Control & Information Technologies (e.g., MES, Enterprise Software) & Equipment • Developing Value Analyses • Established Work Practices • Project Management Methodology & Work Processes*
0845 – 0900	***Domain 1 Feasibility Study: Perform & Document Cost/Benefit Analysis of Automation Alternatives that Meet Business Needs*** *Automation Systems Technology • Choosing the Degree of Automation • Cost/Benefit Analysis Tools • Evaluating Project Viability • Identifying & Assessing Business Needs*
0900 – 0930	***Domain 1 Feasibility Study: Conduct Technical Studies for the Preliminary Automation Strategy by gathering Data & Conducting Appropriate Analyses relative to Requirements in order to Define Development Needs & Risks*** *Conducting Risk Analyses • Defining Primary Control Strategies • Machine Control Theories & Mechatronics (Electro-Mechanical) • Process Control Theories*
0930 – 1000	***Domain 1 Feasibility Study: Perform Justification Analyses by Generating Cost Estimates using Accepted Feasibility & Financial Models to Determine Project Viability*** *Understanding Business Drivers • Costs of Control Equipment • Estimating Techniques to Establish Cost of the System • Evaluating the Results of the*

	Financial Analysis for the Automati on Portion of the Project • Financial & Feasibility Models (e.g., ROI, NPV, Lean Six Sigma)
1000 – 1015	*Break*
1015 – 1100	***Domain 1 Feasibility Study: Solicit Stakeholder "Buy-In" by Creating a Conceptual Summary Document that Reports Preliminary Decisions, Assumptions, Feasibility Results & Financial Justifications in Order to Facilitate "Go/No Go" Decision*** *Communicating Effectively with Varied Audiences in Written or Oral Form • Compiling & Summarizing Information Effectively for Varied Audiences • Data Presentation Tools • Presenting Data & Results in a Logical & Concise Manner*
1100 – 1130	***Domain 2 Definition: Develop System & Process Operational Strategies through Discussion with Key Stakeholders & Using Appropriate Documentation in Order to Create & Communicate Design Requirements*** *Building Consensus • Compiling & Summarizing Information Effectively for Varied Audiences • Data Analysis Tools • Effective Team Leadership • Interpreting Data Interview Techniques • Process and/or Operations Knowledge & Experience*
1130 – 1200	***Domain 2 Definition: Analyze Alternative Technical Solutions in Order to Define the Final Automation Strategy*** *Automation Solutions & Techniques • Basic Control Elements (e.g., Sensors, Instruments, Actuators, Control Systems, Drive Systems, HMI, Batch Control, Machine Control) • Control Systems Theories & Applications • Process and/or Equipment Functionality & Interoperability*
1200 – 1230	***Domain 2 Definition: Establish Detailed Requirements & Data including Network Architecture, Communication Concepts, Safety, Concepts, Regulatory & Industry Codes & Standards, Preferences for Instruments & Equipment, Reporting & Information Needs & Security Architecture through Established Practices in Order to Form the Basis of the Design*** *Communication Protocols including Field Level • Conducting Safety Analyses • Control Systems Security Practices & Requirements • Defining Information Needed for Reports • Defining Which Data is Inspected to Capture • Network Architecture • Regulatory & Industry Standards & Codes • Safety Concepts & Standards (e.g., ISA, ISAM, ANSI, NFPA, OSHA, ISO, ABNT, SAC, STQC)*
1230 – 1245	*Break*
1245 – 1315	***Domain 2 Definition: Generate Focused Project Cost Estimates by Gathering Cost Information from Internal & External Sources in Order to Support Project Financing*** *Available Templates & Tools • Estimating the Cost of Control Equipment & Software • Evaluating Project Viability*
1315 – 1420	***Domain 2 Definition: Summarize Project Requirements by Creating Basis-of-Design & User-Requirements Documents in Order to Launch the Design Phase*** *Basis-of-Design Outlines • Communicating Effectively with Varied Audiences in Written or Oral Form • Compiling & Summarizing Information • User-Requirements Outlines & Bid Documents*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*End of Day One*

Day 2:	Monday, 9th of December 2024
0730 – 0830	***Domain 3 System Design: Perform Safety and/or Hazard Analyses, Security Analyses & Regulatory Compliance Assessments by Identifying Key Issues & Risks in Order to Comply with Applicable Standards, Policies & Regulations*** *Analyzing Hazards • Analyzing Safety Integrity Levels • Applicable Electrical, Mechanical, Safety, Environmental Standards (e.g., EPA, ASME, ISA S84, IEC 61508, 21 CFR Part 11, NFPA, OSHA, UL/FM, NEMA, ISO14000, CSA, ABNT) • Applying Regulations to Design • Assessing Relationships between Jurisdictional Standards • Assessing Security Requirements or Relevant Security Issues • Participating in a Hazard Operability Review • Understanding Differences between Standards, Regulations, Codes & Guidance Documents*
0830 – 0900	***Domain 3 System Design: Analyze Customer Design Criteria & Preferences using the Information gathered in the Definition Stage & Considering Human-Factors Effects in Order to Establish Standards, Templates & Guidelines*** *Designing Electrical & Control Systems • Developing Programming Standards • Drawing Requirements (e.g., ISA 5.x) • Electrical Standards (e.g., NEC, DIN, JIS, CENELEC) • Final Control Elements & other Field Devices • IEC 61131 Programming Languages • Instrument Selection & Sizing • ISA Standards (e.g., ISA88, ISA95)*
0900 – 0930	***Domain 3 System Design: Create Detailed Equipment Specifications & Instrument Data Sheets in order to Purchase Equipment & Support System Design & Development based on Vendor Selection Criteria, Characteristics & Conditions of the Physical Environment, Regulations & Performance Requirements*** *Data Sheets (ISA S20.x) • Designing Electrical & Control Systems • Electrical Standards (e.g., NEC, IEC, SAC, STQC, CENELEC) • Evaluating Equipment Alternatives • Final Control Elements & other Field Devices • Instrument Selection & Sizing • Motor & Drive Selection & Sizing • Selecting & Sizing Control System Equipment • Selecting & Sizing Input/Output Signal Devices and/or Conditioners*
0930 – 0945	*Break*
0945 – 1045	***Domain 3 System Design: Analyze the Quantity, Type & Flow of Data Involved with Automation Systems in order to Provide Specifications for Hardware Selection & Software Development*** *Data Flow in Control Systems • Data Requirements of System to be Automated • Data Structures of Control Systems • Optimizing, Tuning & Normalizing Databases*
1045 – 1115	***Domain 3 System Design: Select the Physical Communication Media, Network Architecture & Protocols based on Data Requirements in order to Complete System Design & Support System Development*** *Archiving Practices • Designing Networks based on Chosen Protocols (e.g., Ethernet, Device Net, Fieldbus) • Grounding & Bonding Practices • Physical & Logical Security Requirements • Physical Requirements for Networks/Media (e.g., Copper, Fiber, RF, IR) • Physical Topology Rules/Limitations • Redundancy & Availability Requirements*
1115 – 1145	***Domain 3 System Design: Develop a Functional Description of the Automation Solution using Rules Established in the Definition Stage in order to Guide Development & Programming*** *Alarm Management & Human Machine Interface (HMI) Philosophy •*

	Communicating the Functional Description to Stakeholders • Control Strategies • Documentation Standards • Interpreting Design Specifications & User Requirements • Process/Equipment to be Automated • Use of Operation Philosophy • Visualization, Alarming, Database/Reporting Techniques (e.g., Control Scheme, Alarms, HMI, Reports)
1145 – 1215	***Domain 3 System Design: Design the Test Plan using Chosen Methodologies in order to Execute Appropriate Testing relative to Functional Requirements*** *Developing Tests that Validate that the System Works as Specified • Functional Description of the System/Equipment to be Automated • General Software Testing Procedures • Relevant Test Standards & Regulatory Requirements (e.g., FDA, CENELEC, STQC, JIS) • Simulation Tools • Writing Test Plans*
1215 – 1230	*Break*
1230 – 1300	***Domain 3 System Design: Perform the Detailed Design for the Project by Converting the Engineering & System Design into Purchase, Requisitions, Drawings, Panel Designs & Installation Details Consistent with the Specification & Functional Descriptions in order to Provide Detailed Information for Development & Deployment of Construction Work Packages*** *Applicable Construction Codes • Document & Drawing Standards • Electrical & Wiring Practices • Field Devices, Control Devices, Visualization Devices, Computers & Networks • Installation Standards & Practices (e.g., Field Devices, Computer Hardware, Cabling) • Understanding Customer Preferences • Using Functional Requirements & Specifications of the System/Equipment to be Automated*
1300 – 1330	***Domain 4 Development: Develop Human Machine Interface (HMI) in Accordance with the Design Documents in order to Meet the Functional Requirements*** *Alarm & Security Schemes & Features • Capture, Analysis & Display of Trending & Historical Data • Computer Operating Systems • Database Fundamentals • Documenting the Configuration & Programs • Human Factors Design (e.g., Navigation Menus, Logical & Effective Data Presentation) • Implementing Network Connections & Interface Systems • Programming Structure Techniques & Configurations • Report Configurations • Tag Definition Schemes*
1330 – 1420	***Domain 4 Development: Develop Database & Reporting Functions in Accordance with the Design Documents in order to Meet the functional Requirements*** *Computer Operating Systems • Creating Reports & Formatting/Printing Specifications for Report Output • Data Mapping • Designing Logical & Effective Reports • Documenting Database Configuration • Implementing Network Connections & Interface Systems • Interpreting Functional Descriptions • Programming Structure Techniques & Configurations • Relational Database Design, Theory & Administration • Writing Database Queries*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*End of Day Two*

Day 3: **Tuesday, 10th of December 2024**

0730 – 0830	***Domain 4 Development: Develop Control Configuration or Programming in Accordance with the Design Documents in order to Meet the Functional Requirements*** *Alarm & Security Schemes & Features • Computer Operating Systems • Documenting the Configuration & Programs • Hardware Configuration & I/O Structure (e.g., DCS, PLC, Rack) • Implementing Network Connections & Interface systems • Interpreting Drawings & Functional Descriptions including Control Strategies, Logic Drawings, P&IDs & PFDs • Memory Addressing & Tag Definition Schemes • Process and/or Equipment to be Automated • Programming, Configuration & Processor Capabilities • Standard Nomenclature (e.g., ISA) • Structured Programming Techniques*
0830 – 0900	***Domain 4 Development: Implement Data Transfer Methodology using Communications & Network Protocols in Accordance with Design Documents in order to Meet Functional Requirements*** *Analyzing Throughput • Computer Operating Systems • Configure Network Products • Data Mapping • Documenting the Configuration & Programs • Ensuring Data Integrity • Interfacing & Systems & Gateways • Network Protocols & Topology*
0900 – 0930	***Domain 4 Development: Implement Automation System Security in Accordance with the Design Documents in order to Meet the Functional Requirements*** *Configuring/Programming of Security System • Documenting the Security Configuration & Programs • Industry & Regulatory Standards (e.g., ISA 99, 21 CFR Part 11, IEEE-802) • System/Network Security Techniques*
0930 – 0945	*Break*
0945 – 1015	***Domain 4 Development: Conduct Peer Reviews of Configuration & Programming in order to Establish Compliance with Functional Requirements*** *Alarming Schemes • Computer Operating Systems • Documenting the Configuration & Programs • Functional Requirements of System/Equipment to be Automated • Hardware Configuration & I/O Structure (e.g., DCS, PLC Rack) • I/O Structure • Memory Addressing Schemes • Networking & Data Communications • Programming and/or Configuration Capabilities • Programming Structure Techniques & Configurations • Reviewing Programming/Configuration for Compliance with Design Requirements*
1015 – 1045	***Domain 4 Development: Conduct Offline or FAT (Factory/Functional Acceptance Testing) Testing of Automation Systems using the Test Plan in Order to Determine Compliance with Functional Requirements*** *Alarm & Security Schemes & Features • Computer Operating Systems • Documenting Test Results & Deviations • Executing Test Plans • Functional Requirements of System/Equipment to be Automated • Hardware Configuration & I/O Structure (e.g., DCS, PLC Rack) • I/O Structure • Implementing Connections to Remote Devices • Interpreting Functional Requirements of System/Equipment to be Automated • Interpreting P&IDs • Memory Addressing Schemes • Networking & Data Communications • Programming and/or Configuration Capabilities • Testing Techniques • Writing FAT Procedure*
1045 – 1115	***Domain 4 Development: Assemble all required Documentation & User manuals Created during the Development Process in order to Transfer Essential Knowledge to Customers & End Users*** *Documenting Equipment Information & Procedures for End Users • Documentation Practices • Functional Requirements of System/Equipment to*

	be Automated • General Understanding of Automation Systems • Operations Procedures
1115 – 1200	***Domain 5 Deployment: Review and/or Perform the Physical Inspection Process of Installed Equipment against Construction Drawings in order to Ensure Installation in Accordance with Design Drawings & Specifications*** *Applicable Codes & Regulations (e.g., NEC, Building Codes, OSHA, CENELEC EN Codes, Applicable IEC Regulations) • Comparing Physical Implementation to Drawings • Construction Documentation • Development of Discrepancy Reporting Process (e.g., Punch Lists) • Installation Standards & Practices (e.g., Field Devices, Computer Hardware, Cabling) • Reconciling & Reporting of Redlines & other Descrepancies*
1200 – 1215	*Break*
1215 – 1245	***Domain 5 Deployment: Conduct Site Acceptance Testing of Communication Systems & Field Devices in Accordance with Design Specifications in order to Ensure Proper Device Operation*** *Applicable Standards, Regulations & Procedures Relative to Testing • Communication Networks & Protocols • Comparing Test Results to Design Specifications • Conducting & Documenting Field Device Tests • Field Devices & their Performance Requirements • Management of Change Procedures • Test Plan & Methodology (e.g., Loop Checks, Point-to-Point) for the System/Equipment to be Automated • Verifying Control System Installation (e.g., PLC, DCS, PC) • Versioning Techniques & Revision Control*
1245 – 1315	***Domain 5 Deployment: Test Safety Elements & Systems by Executing Test Plans in order to Ensure that Safety Functions Operate as Designed*** *Applicable Safety Standards, Regulations & Procedures • Executing & Documenting Test Plans • Safety System Design*
1315 – 1420	***Domain 5 Deployment: Test Security Features by Executing Test Plans in order to Ensure that Security Functions Operate as Designed*** *Applicable Security Standards, Regulations & Procedures • Executing & Documenting Test Plans • Security System Design • Vulnerability Assessments*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*End of Day Three*

Day 4: ***Wednesday, 11th of December 2024***

0730 – 0830	***Domain 5 Deployment: Execute Operational Tests in Accordance with the Test Plan; Make Necessary Adjustments in order to Ensure the Entire System including Safety & Security Systems Functions as Designed*** *Adjusting Final Control Elements • Applicable Standards, Regulations & Procedures relative to Testing • Communicating Final Results to Facility Personnel • Computer System Performance Tuning • Control System Hardware • Executing & Documenting Test Plants • Loop Tuning Methods/Control Theory • Network & Data Communications • Optimizing Software Performance*
0830 – 0900	***Domain 5 Deployment: Troubleshoot & Resolve Problems Identified during Installation & Testing using a Structured Methodology in order to Correct System Deficiencies & Turn the System Over to Stakeholder*** *Communicating Effectively with Varied Audiences in Written or Oral Form •*

	Equipment History Documentation • Implementing Problem Solutions within System Limitations • Processes, Equipment, Configurations & Programming • Structure Troubleshooting Techniques (e.g., Isolation, Trial & Error, "Circle the Wagon," Trends, Root Cause Analysis)
0900 – 1000	***Domain 6 Operation & Maintenance: Develop & Conduct Periodic Systems & Component Inspection Protocols to Verify the Operation of Systems to Pre-Determined Standards & Requirements*** *Analyzing Test Results • Applicable Standards, Regulations & Procedures relative to Testing • Inspection & Testing Methods • Using Software & Hardware Diagnostic Tools*
1000 – 1015	*Break*
1015 – 1215	***Domain 6 Operation & Maintenance: Provide Technical Support for Facility Personnel by Applying System Expertise in order to Maximize System Availability*** *Analytical Troubleshooting & Root-Cause Analysis • Automation System Functionality • Communication Tools & Techniques for Working with End-User Audiences • Control Systems Theories & Applications • Investigating & Listening • Operation Maintenance Procedures • Processes & Equipment • Programming & Configuring Automation System Components using Appropriate Tools*
1215 – 1230	*Break*
1230 – 1420	***Domain 6 Operation & Maintenance: Work with Training Professionals to Perform Training Needs Analysis, Establish Training Goals & Measurable Outcomes & Participate in Training Development & Delivery for Customers & Personnel on the Safe Operation of Automated Systems*** *Applicable Standards, Regulations & Procedures • Assessing Personnel Training Requirements • Instructional Techniques & Methods • Training Program Development*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*End of Day Four*

Day 5: ***Thursday, 12th of December 2024***

0730 - 0930	***Domain 6 Operation & Maintenance: Monitor Performance using Software & Hardware Diagnostic Tools in Order to Support Early Detection of Potential Problems*** *Acceptable Performance Limits • Analyzing Data • Automation Systems • Baseline/Normal System Performance*
0930 – 0945	*Break*
0945 – 1100	***Domain 6 Operation & Maintenance: Monitor Performance using Software & Hardware Diagnostic Tools in Order to Support Early Detection of Potential Problems (cont'd)*** *Potential Problem Indicators • System Monitoring Techniques (e.g., Tracking & Trending, Asset Management, Alarming)*
1100 – 1230	***Domain 6 Operation & Maintenance: Perform Continuous Improvement by Working with Facility Personnel in order to Increase Capacity, Reliability and/or Efficiency*** *Analyzing Data • Understanding Business Needs • Communicating Effectively with Varied Audiences in Written or Oral Form*
1230 - 1245	*Break*
1245 – 1345	***Domain 6 Operation & Maintenance: Perform Continuous Improvement***

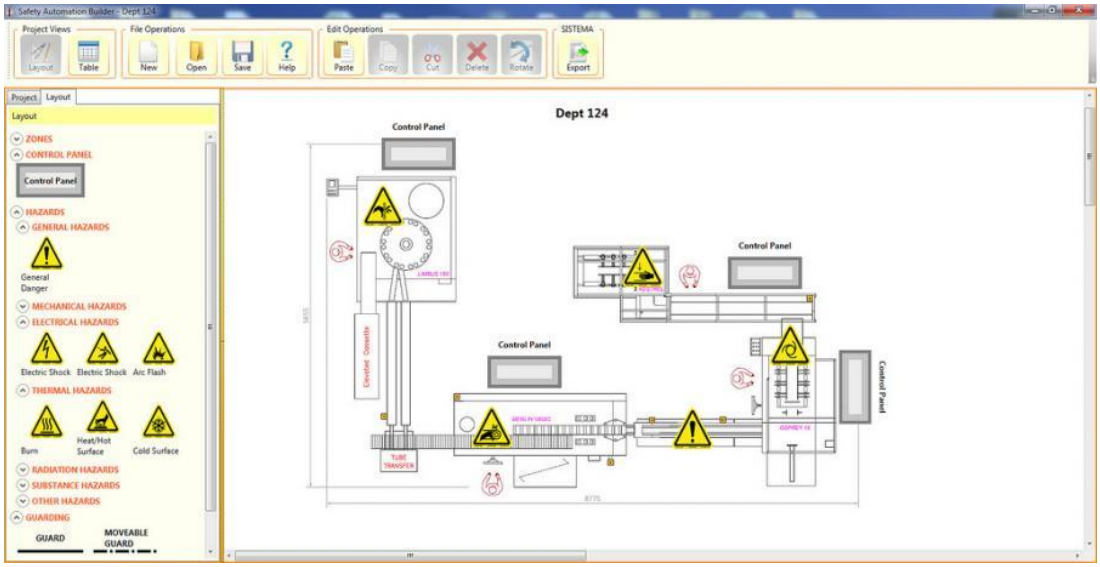
	by Working with Facility Personnel in order to Increase Capacity, Reliability and/or Efficiency (cont'd) *Continuous Improvement Techniques & Procedures • Control Systems Theories & Applications*
1345 - 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 - 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*End of Course*

MOCK Exam

Upon the completion of the course, participants have to sit for a MOCK Examination similar to the exam of the Certification Body through Haward's Portal. Each participant will be given a username and password to log in Haward's Portal for the MOCK exam during the 7 days following the course completion. Each participant has only one trial for the MOCK exam within this 7-day examination window. Hence, you have to prepare yourself very well before starting your MOCK exam as this exam is a simulation to the one of the Certification Body.

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the "Safety Automation Builder Software (Rockwell Automation)" simulator.



Safety Automation Builder (Rockwell Automation) Simulator