Control Systems Training
Managing the processes and systems that support automation
Expert-led training with real-world application from a global leader in automation and control training

Industrial control systems (ICS) are at the heart of industrial automation, playing a critical role in managing the operations of critical infrastructure, such as power grids; financial networks; and transportation, telecommunications, and manufacturing systems.

Many of ISA's instructors are world-renowned control systems experts with extensive, working knowledge of a variety of control systems and technologies used in industrial production, from supervisory control and data acquisition (SCADA) systems and distributed control systems (DCS) to programmable logic controllers (PLC).

ISA offers comprehensive control systems training across essential areas, including:
- Basic continuous control
- Control strategy design and application
- Integration and software
- Instrumentation maintenance and troubleshooting
- Control documentation
- Advanced control
- Automatic controls and robotics
- Industrial data communications
- Cybersecurity
- Certification and exam review courses

All ISA control system-related training courses deliver practical instruction that can be immediately applied in the workplace. Relevant examples and case histories further reinforce the real-world value. To ensure flexibility and to meet varying customer needs, training is available in an array of formats and offered in a variety of locations: at ISA headquarters in North Carolina, at ISA’s many regional training centers, and onsite directly at customer facilities.

ISA also offers two certification programs for those working with control systems: Certified Control Systems Technician® (CCST®) and Certified Automation Professional® (CAP®). In addition, ISA provides comprehensive study materials and review courses for those preparing to take the Control Systems Engineer (CSE) Professional Engineer (PE) examination.

**ISA Training: World-class subject-matter expertise**

ISA’s courses are known and respected worldwide for their unbiased, practical approach to technology application. For more than 65 years, ISA has built on its proven track record of identifying and providing the real-world resources needed by organizations and automation and control professionals by working with leading content experts to deliver rapid, customized solutions.

**Taking an ISA training course will:**
- Enhance on-the-job training
- Fill in missing knowledge gaps
- Teach you the Hows and Whys
- Provide continuing education credits
- Expand your professional network
- Give you access to industry experts
Table of Contents

Introduction to Industrial Processes, Measurement and Control (FG07) ........................................ 4

Fundamentals of Industrial Process, Measurement and Control—Online (FG05E) .................... 5

Fundamentals of Industrial Process, Measurement and Control—On-demand (FG05M) .......... 6

Developing and Applying Standard Instrumentation and Control Documentation (Online) (FG15E) .............................................. 7

Tuning Control Loops (TC05) .................................................. 8

Troubleshooting Instrumentation and Control Systems (TC10) .............................................. 9

Designing and Tuning Feedback and Advanced Regulatory Control Strategies (EC05) .................. 10

Batch Control Using the ANSI/ISA88 Standards (Online) (IC40) Onsite offering only ......... 11

Batch Control Using the ANSI/ISA88 Standards (Online) (IC40E) ........................................ 12

Certified Control Systems Technician® (CCST®) Level I Exam Review Course (TS00) .......... 13

Certified Control Systems Technician® (CCST®) Level I Online Exam Review Course (TS00E) ......................................................... 14

Certified Control Systems Technician® (CCST®) Level II Exam Review Course (TS02) ......... 15

Certified Control Systems Technician® (CCST®) Level II Online Exam Review Course (TS02E) ......................................................... 16

Certified Control Systems Technician® (CCST®) Level III Exam Review Course (TS03) ........ 17

Certified Control Systems Technician® (CCST®) Level III Online Exam Review Course (TS03E) ......................................................... 18

Features of ISA Online, Instructor-Assisted E-Courses ................................................................. 19

Who is ISA?

Founded in 1945, ISA is a global organization that serves automation and control professionals through standards development, certification, education and training, technical publications, and technical conferences and events. To learn more about ISA, visit: www.isa.org

Register or learn more at www.isa.org/COSYTRN
Introduction to Industrial Processes, Measurement and Control (FG07)
(Combines lecture and hands-on labs)

This popular course combines lecture and hands-on labs to provide an overview of industrial measurement and control. Technicians, engineers, and managers are provided with a foundation for communication with other control system professionals. This course serves as a solid fundamental course for introduction to other ISA courses.

YOU WILL BE ABLE TO:
• Communicate with measurement and control professionals
• Apply specific ISA standards to interpret symbols and drawings associated with process control documentation
• Discuss and apply the most common methods and devices used in temperature, pressure, level, and flow measurement
• Differentiate between control system architectures including single loop controllers, Distributed Control Systems (DCS), and Programmable Logic Controllers (PLC)

YOU WILL COVER:
• Concepts of Process Control
• Documentation
• Measurement: Pressure | Level | Flow | Temperature
• Control Valves
• Smart Field Devices
• Communicate with measurement and control professionals
• Discuss the role of measurement and control in industrial processes
• Differentiate between continuous, batch, and discrete control
• Apply specific ISA standards to interpret symbols and drawings associated with process control documentation
• And more…

CLASSROOM/LABORATORY EXERCISES:
• Calibrate process measurement devices for level, temperature, pressure, and flow using a variety of state-of-the-art calibration equipment
• Operate digital controllers
• Build and tune an actual feedback control loop
• Interpret simple P&IDs
• Configure smart transmitters
• And more…

COURSE DETAILS:
Course No.: FG07
Length: 4.5 days
CEUs: 3.2
Price: 3,080 USD ISA Member
3,465 USD Affiliate Member
3,855 USD Community Subscriber/List
3,080 USD Multi-Registration Rate

2019 SCHEDULE
Research Triangle Park, NC ...................... 14–18 January;
17–21 June
Houston, TX ................................................ 18–22 February;
20–24 May

Register or learn more at www.isa.org/COSYTRN
Fundamentals of Industrial Process Measurement & Control—Online (FG05E)

DESCRIPTION:
This self-paced, online course provides an overview of industrial measurement and control for technician, engineers, and managers providing a basic understanding and foundation for communication with other control systems professionals.

YOU WILL BE ABLE TO:
• Communicate the latest trends in measurement and control
• Recognize the role of measurement and control in industrial processes
• Compare continuous, batch, and discrete control and how they are used in industry
• Interpret measurement and control terminology
• Compare the methods and devices used in temperature, pressure, level, and flow measurement
• Describe the operation and components of a feedback control loop
• Identify the fundamental concepts of controller tuning
• Compare different control system architectures, including single loop controllers, distributed control systems (DCS), and programmable logic controllers (PLCs)
• Apply ISA standards to interpret symbols and documentation

YOU WILL COVER:
Pre-Exam
Students are asked to take the pre-exam, which includes questions related to the subject matter areas. Answers will be provided for students to assess their knowledge, prior to beginning the course material.
WEEK 1—Module 1: Concepts of Process Control
WEEK 2—Module 2: Documentation
WEEK 3—Modules 3 & 4: Industrial Measurement Systems (Parts I & II)
WEEK 4—Module 5: Temperature Measurement (Part I)
WEEK 5—Module 6: Temperature Measurement (Part II) & Module 7: Pressure Measurement
WEEK 6—Modules 8 & 9: Level Measurement (Parts I & II)
WEEK 7—Modules 10 & 11: Flow Measurement (Parts I & II)
WEEK 8—Modules 12 & 13: Control Valves (Parts I & II)
WEEK 9—Modules 14 & 15: Feedback Control Strategies (Parts I & II)
WEEK 10—Module 16: Smart Field Devices
WEEK 11—Module 17: Advanced Control Strategies & Module 18: Control System Hardware
WEEK 12—Final Examination

CLASSROOM MATERIALS:
• Course notest with slides from course modules and course syllabus

COURSE DETAILS:
Course No.: FG05E
Length: 12 weeks
CEUs: 2.1
Price: 1,680 USD ISA Member
1,890 USD Affiliate Member
2,105 USD Community Subscriber/List
1,680 USD Multi-Registration Rate

2019 SCHEDULE
Online .............................. 11 February–3 May;
13 May–13 July;
12 August–1 November;
30 September–27 December

Register or learn more at www.isa.org/COSYTRN
Fundamentals of Industrial Process Measurement & Control (FG05M) On-demand Course

DESCRIPTION:
This online, modular, interactive, computer-based training is available anytime on-demand. This course is an overview of industrial measurement and control for technicians, engineers, and managers. It provides the basic understanding and foundation for communication with other control systems professionals.

YOU WILL BE ABLE TO:
- Communicate the latest trends in measurement and control
- Recognize the role of measurement and control in industrial processes
- Compare continuous, batch, and discrete control and how they are used in industry
- Interpret measurement and control terminology
- Compare the methods and devices used in temperature, pressure, level, and flow measurement
- Describe the operation and components of a feedback control loop
- Identify the fundamental concepts of controller tuning
- Compare different control system architectures, including single loop controllers, distributed control systems (DCS), and programmable logic controllers (PLCs)
- Apply ISA standards to interpret symbols and documentation

Full Bundle or Individual Modules Available!
You have the option of taking only one module, multiple modules or, for the best value, all twelve modules – access just what you need, just when you need it!

COURSE DETAILS:
Course No: FG05M
Length: 12 Modules
CEUs: Varies per module
Full Course Price: 1,080 USD – Member
1,350 USD – Non-member

Receive a 10% discount when you purchase all modules!*
- All Modules: FG05M Full Course
- Module 1: Concepts of Process Control
- Module 2: Documentation
- Module 3: Industrial Measurement Systems (Parts I & II)
- Module 4: Temperature Measurement (Parts I & II)
- Module 5: Pressure Measurement
- Module 6: Level Measurement (Parts I & II)
- Module 7: Flow Measurement (Parts I & II)
- Module 8: Control Valves (Parts I & II)
- Module 9: Feedback Control Strategies (Parts I & II)
- Module 10: Advanced Control Strategies
- Module 11: Smart Field Devices
- Module 12: Control System Hardware

*10% Discount is already calculated in the full course price.
Developing and Applying Standard Instrumentation and Control Documentation—Online (FG15E)

This course will present the methodology for the designing and developing control systems documentation. The development of piping and instrument diagrams (P&IDs) and related ISA drawings are emphasized. This course covers both the development and the reading/interpreting of these documents, making it beneficial to engineers, designers, software programmers, system integrators, and technicians.

YOU WILL BE ABLE TO:
• Design, develop, and interpret the documents used to define instruments and control systems for a typical project, including P&IDs, loop diagrams, specification forms, instrument lists, logic diagrams, installation details, and location plans
• Explain the information included on each document
• Plan document development as it relates to project management
• Apply ISA standards for symbols and terminology to documentation
• Describe the relationship of ISO 9000, OSHA process safety management (PSM), and API 750 to control systems documentation

YOU WILL COVER:
• P&IDs
• Instrument Lists
• Control System Software
• Logic Diagrams
• Installation Details
• Location Plans
• Loop Diagrams
• And more…

COURSE DETAILS:
Course No.: FG15E
Length: 8 weeks
CEUs: 1.4
Price: 1,440 USD ISA Member
       1,620 USD Affiliate Member
       1,800 USD Community Subscriber/List
       1,440 USD Multi-Registration Rate


2019 SCHEDULE
Online ............................27 March–17 May; 3 June–26 July; 9 September–8 November; 12 December–24 January, 2020

Register or learn more at www.isa.org/COSYTRN
Tuning Control Loops (TC05)

This course is recommended for anyone who would like to gain a better understanding of how to tune control loops—whether you have tuned loops but would like to become more proficient or you have never tuned a loop before.

NOTE: Registrants are expected to have a basic understanding of instrumentation and controls (either by working experience or taking fundamental courses such as ISA’s course FG07: Introduction to Industrial Automation and Control) as this course does not cover that material.

YOU WILL BE ABLE TO:
- Identify the requirements for open-loop and closed-loop stability
- Use three methods to tune a control system for stated quality control
- Tune a cascade control loop for optimum control
- Tune a feedforward control system for optimum control
- Tune ratio control systems
- And more...

YOU WILL COVER:
- Review of Feedback Control Concepts and Components
- Control Modes
- Dynamic and Steady State Considerations
- Tuning Control Systems
- Safety Concerns and Procedures when Operating Control Systems
- And more...

CLASSROOM/LABORATORY EXERCISES:
- Demonstrate the operation of components required for closed-loop control
- Review start-up procedures for single- and multi-loop systems
- Tune cascade, ratio, and feedforward control systems
- Tune using a PC-based simulation software
- And more...

COURSE DETAILS:
Course No.: TC05
Length: 3 days
CEUs: 2.1
Price: 
  - 1,680 USD ISA Member
  - 1,800 USD Affiliate Member
  - 2,105 USD Community Subscriber/List
  - 1,680 USD Multi-Registration Rate

Recommended Resource:

2019 SCHEDULE
Newall, CA ....................... 28–30 January
Royersford, PA ................... 11–13 March
Houston, TX ...................... 15–17 April
Register or learn more at www.isa.org/COSYTRN
Troubleshooting Instrumentation and Control Systems (TC10)

This course presents a systematic approach to troubleshooting and start-up of single- and multi-loop control loops. You will learn how pressure, level, flow, and temperature loops operate to maintain good process control systems. Knowledge of instrumentation and control is assumed.

YOU WILL BE ABLE TO:
- Develop a systematic approach to troubleshooting
- Verify, locate, and identify performance problems and the causes of the problems
- Identify the common causes of sensor, transmitter, controller, and final control element problems
- Troubleshoot control systems
- Compare general troubleshooting procedures for conventional, FIELDBUS, and HART™ control systems
- And more...

YOU WILL COVER:
- Approaches to Troubleshooting
- Logical Analysis Troubleshooting
- Review of ISA Standard Diagrams and Symbols
- Single-Loop Feedback Control Troubleshooting
- Multi-Loop Control Systems Troubleshooting
- And more...

CLASSROOM/LABORATORY EXERCISES:
- Diagnose and solve problems with single-loop control loops
- Diagnose and solve problems with ratio, cascade, and three-element control loop systems
- Diagnose problems using distributed control system (DCS) displays for information
- Troubleshoot several single control loop problems

COURSE DETAILS:
Course No.: TC10
Length: 2 days
CEUs: 1.4
Price: 1,680 USD ISA Member
1,890 USD Affiliate Member
2,105 USD Community Subscriber/List
1,680 USD Multi-Registration Rate

Recommended Resource:

Register or learn more at www.isa.org/COSYTRN
Designing and Tuning Feedback and Advanced Regulatory Control Strategies (EC05)

For those who select or design process control strategies, this course provides a thorough background in feedback control, plus a working knowledge of the application of advanced regulatory control strategies such as ratio, cascade, feedforward, override, and decoupling. The course emphasizes the benefits of advanced regulatory control for improving the economics of process operations.

YOU WILL BE ABLE TO:
• Determine process characteristics that are relevant to the design and/or troubleshooting of a control loop
• Apply a variety of feedback controller tuning techniques and know the strengths and weaknesses of each
• Select an appropriate control strategy for a given application
• Provide the engineering design for control strategies using a DCS or other platform available at your plant
• And more…

YOU WILL COVER:
• Process Control Loop Characteristics
• Feedback Control
• Controller Tuning
• Advanced Control Strategies
• And more…

CLASSROOM/LABORATORY EXERCISES:
• Use a control loop simulation program for hands-on practice of several feedback controller tuning techniques
• Observe the effect of each topic, such as the behavior of cascade and feedforward control, through a simulation program demonstration

RECOMMENDED PREREQUISITES:
• Familiarity with fundamental process measurement techniques, signal transmission technologies used in the process industries, and some type of process operator (control room) work station
• Mathematical competency equivalent to high school Algebra
  (Note: A brief review of mathematical concepts used in class will be provided at the beginning of the course.)

COURSE DETAILS:
Course No.: EC05
Length: 3 days
CEUs: 2.1
Price:  
- 1,440 USD ISA Member
- 1,620 USD Affiliate Member
- 1,800 USD Community Subscriber/List
- 1,440 USD Multi-Registration Rate

Includes ISA Text: *Basic and Advanced Regulatory Control: System Design and Application, Third Edition* by Harold L. Wade
  —A 109 USD Value

2019 SCHEDULE
Newark, DE................................. 2–4 April

Register or learn more at www.isa.org/COSYTRN
Batch Control Using the ANSI/ISA88 Standards (IC40)

This course presents an approach to developing functional requirements/specifications using the models and terminology defined in the ANSI/ISA88 batch control standards. A review of the characteristics of batch manufacturing systems is included. Participants will explore the ANSI/ISA88 concept that separates the recipe from the equipment. This course includes a methodology that defines an object approach based on ANSI/ISA88 that promotes the reuse of these objects from one project to the next.

YOU WILL BE ABLE TO:
- Specify the requirements for a batch control system
- Effectively structure and subdivide equipment entities
- Describe modes and states and how they are applied at the equipment level
- Develop phase logic that executes in equipment and that can deal with both normal and abnormal operations
- Identify the alternative architectures for programmable logic controllers (PLCs), distributed control systems (DCSs), and PC-based control systems
- And more…

YOU WILL COVER:
- ANSI/ISA88 Standards
- Physical Model
- Procedural Control Mode
- Batch Tracking
- Control Activity Model
- And more…

CLASSROOM/LABORATORY EXERCISES:
- Develop procedural elements using the ANSI/ISA88 procedural control model and test those procedural elements against the equipment entities
- Develop recipes using the ANSI/ISA88 recipe model and the ANSI/ISA88 recipe representation
- Develop phase logic that runs in the equipment entities and links to the procedural elements
- Apply the modes and various states defined in ANSI/ISA88

COURSE DETAILS:
Course No.: IC40
Length: 3 days
CEUs: 2.1
For pricing and to schedule this course, email: trainingsales@isa.org

Includes ISA Standards:
ANSI/ISA-88.00.01-2010, ANSI/ISA-88.00.02-2001, and ANSI/ISA-88.00.03-2003—A 490 USD Value!
Batch Control Using the ANSI/ISA88 Standards (IC40E)

This course presents an approach to developing functional requirements/specifications using the models and terminology defined in the ANSI/ISA88 batch control standards. A review of the characteristics of batch manufacturing systems is included. Participants will explore the ANSI/ISA88 concept that separates the recipe from the equipment. This course includes a methodology that defines an object approach based on ANSI/ISA88 that promotes the reuse of these objects from one project to the next.

YOU WILL BE ABLE TO:
• Specify the requirements for a batch control system
• Effectively structure and subdivide equipment entities
• Define procedural elements that can be effectively used with the above equipment entities
• Describe modes and states and how they are applied at the equipment level
• Develop phase logic that executes in equipment and that can deal with both normal and abnormal operations
• Recognize the various control languages that are available
• Identify the alternative architectures for programmable logic controllers (PLCs), distributed control systems (DCSs), and PC-based control systems
• Describe the interfaces that are needed between batch control and other systems within an enterprise

COURSE DETAILS:
Course No.: IC40E
Length: 7 weeks
CEUs: 2.1
Price:
  1,560 USD ISA Member
  1,755 USD Affiliate Member
  1,955 USD Community Subscriber/List
  1,560 USD Multi-Registration Rate

Includes ISA Standards:
ANSI/ISA-88.00.01-2010, ANSI/ISA-88.00.02-2001, and ANSI/ISA-88.00.03-2003—A 490 USD Value!

ONLINE VERSION

Register or learn more at www.isa.org/COSYTRN
Certified Control Systems Technician® (CCST®) Level I Exam Review Course (TS00)

This is a fast-paced review of the knowledge and practical skills necessary to install and maintain standard measurement and control instrumentation. It is intended for practicing technicians preparing for the CCST Level I exam. An explanation of the examination process and practice certification-type exam questions are provided.

YOU WILL BE ABLE TO:
- Cite principles and theories that explain measurement and control instrument functions
- Describe procedures required to properly maintain the function of measurement and control instrumentation
- Perform calculations and other analysis of information related to the calibration and troubleshooting of measurement and control instruments and systems
- Describe procedures required to safely start-up and shut-down a new or existing process
- Identify any need for further study or training in specific knowledge areas
- And more...

YOU WILL COVER:
- Concepts of Process Control
- Domain 1: Calibration, Maintenance, Repair, Troubleshooting
- Domain 2: Project Start-Up, Commissioning, Loop Checking, Project Organization, Planning
- Domain 3: Documentation
- And more…

CLASSROOM/LABORATORY EXERCISES:
- Unit conversion calculations
- Calibration documentation and analysis
- Trouble recognition and analysis
- ISA CCST Level I practice exams

COURSE DETAILS:
Course No.: TS00
Length: 4 days
CEUs: 2.8
Price: 2,380 USD ISA Member
2,680 USD Affiliate Member
2,980 USD Community Subscriber/List
2,380 USD Multi-Registration Rate

Includes ISA Text: CCST® Study Guide Level I—A 39 USD Value!

Special Savings Bonus!
Take this review course and sit for the CCST Level I electronic exam for FREE! You must submit a CCST application and course registration six (6) weeks prior to your course date and meet CCST Level I eligibility criteria to be qualified for the free exam. You will be able to schedule an electronic exam date once your application has been approved. For more details, visit www.isa.org/CCST.

2019 SCHEDULE
Research Triangle Park, NC ......... 28–31 January
Houston, TX ............................. 25–28 March
Royersford, PA ........................... 13–16 May

Register or learn more at www.isa.org/COSYTRN

Register Now
Certified Control Systems Technician® (CCST®) Level I Online Exam Review Course (TS00E)

This online, instructor-assisted course is a fast-paced review of the knowledge and practical skills necessary to install and maintain standard measurement and control instrumentation. It is intended for practicing technicians preparing for the ISA Certified Control Systems Technician® (CCST®) Level I exam. Practice certification-type exams and an explanation of the examination process are provided.

YOU WILL BE ABLE TO:
- Cite principles and theory that explain measurement and control instrument functions
- Describe procedures required to properly maintain the function of measurement and control instrumentation
- Identify the procedures and safety requirements for loop checking and its purpose
- Perform calculations and other analyses of information related to the calibration and troubleshooting of measurement and control instruments and systems
- Describe procedures required to safely start-up and shut-down a new or existing process
- Define the education, experience, and examination requirements for becoming a CCST
- Identify important knowledge and skill requirements of a practicing CCST
- Describe the procedures involved in taking the CCST Level I exam
- Identify any need for further study or training in specific knowledge areas
- Complete simulated CCST Level I practice exams

YOU WILL COVER:
- **Week 1:** CCST Certification Overview/Concepts of Process Control
- **Week 2:** Domain 1—Calibration, Maintenance, Repair, and Troubleshooting
- **Week 3:** Domain 1—Calibration, Maintenance, Repair, and Troubleshooting (cont’d)
- **Week 4:** Domain 1—Calibration, Maintenance, Repair, and Troubleshooting (cont’d)
- **Week 5:** Domain 2—Project Start-up, Commissioning, Loop-checking, Project Organization, and Planning
- **Week 6:** Domain 2—Project Start-up, Commissioning, Loop-checking, Project Organization, and Planning (cont’d)
- **Week 7:** Domain 2—Project Start-up, Commissioning, Loop-checking, Project Organization, and Planning (cont’d)
- **Week 8:** Domain 3—Documentation
- **Week 9:** Domain 3—Documentation (cont’d)
- **Week 10:** Domain 3—Documentation (cont’d)
- **Week 11:** Final Course Examination

COURSE MATERIALS:
- Course Noteset and Syllabus
- ISA Text: **CCST® Study Guide Level I—A 39 USD Value!**

COURSE DETAILS:
- Course No.: TS00E
- Length: 11 weeks
- CEUs: 2.8
- Price: 2,380 USD ISA Member
  - 2,680 USD Affiliate Member
  - 2,980 USD Community Subscriber/List
  - 2,380 USD Multi-Registration Rate

2019 SCHEDULE
Online .............................. 18 February–3 May;
20 May–9 August;
12 August–1 November

Register or learn more at [www.isa.org/COSYTRN](http://www.isa.org/COSYTRN)
Certified Control Systems Technician® (CCST®) Level II Exam Review Course (TS02)

This is a fast-paced review of the knowledge and skills necessary for technicians with 7+ years of practical experience who are preparing to sit for the CCST Level II exam. An explanation of the requirements, examination process and practice certification-type exams are provided.

YOU WILL BE ABLE TO:
- Explain multi-step troubleshooting methodology
- Evaluate control systems tuning and system response to changes in control parameters
- Describe the isolation of a process component from an operational system to perform proper testing, maintenance, or troubleshooting
- Evaluate installed industrial network data and performance using network diagnostic tools
- Explain the process to identify and correct problems that may arise during the commissioning of control systems

YOU WILL COVER:
- Concepts of Process Control | Instrument Air
- Piping & Instrumentation Diagrams (P&ID) | Basic Measuring Units
- Fundamentals of Instrumentation
- Temperature | Pressure | Flow | Level
- Analyzers | Final Control Elements
- Safety | Electricity
- Advancing Technologies | Numbering Systems
- PLCs Basics | Basic Requirements for Protocol
- Fieldbus | Communications Protocol
- Fiber Optics | SCADA
- Process Dynamics | Control Action
- PID | Tuning | Advanced Control Strategy
- Calibration | Instrument Performance
- Pressure Test & Calibration Equipment | Instrument Maintenance
- Best Procedures for LAN’s | Troubleshooting with Statistics | Tools
- DCS Troubleshooting | Hazardous Locations
- Installation | Start-Up | Loop Checking

CLASSROOM/LABORATORY EXERCISES:
ISA CCST Level II practice exams

COURSE DETAILS:
Course No.: TS02
Length: 4 days
CEUs: 2.8
Price: 2,380 USD ISA Member
       2,680 USD Affiliate Member
       2,980 USD Community Subscriber/List
       2,380 USD Multi-Registration Rate

Includes ISA Text: CCST® Study Guide Level II—a 39 USD Value!

2019 SCHEDULE
Newhall, CA ....................................22–25 April

Register or learn more at www.isa.org/COSYTRN
Certified Control Systems Technician® (CCST®) Level II Online Exam Review Course (TS02E)

This is a fast-paced review of the knowledge and skills necessary for technicians with 7+ years of practical experience who are preparing to sit for the CCST Level II exam. An explanation of the requirements, examination process and practice certification-type exams are provided.

YOU WILL BE ABLE TO:
• Explain multi-step troubleshooting methodology
• Evaluate control systems tuning and system response to changes in control parameters
• Describe the isolation of a process component from an operational system to perform proper testing, maintenance, or troubleshooting
• Evaluate installed industrial network data and performance using network diagnostic tools
• Explain the process to identify and correct problems that may arise during the commissioning of control systems
• Verify final control element functionality through manipulated variables using controller mode and output functions
• Define system documentation and symbology to effectively troubleshoot instrumentation, control loops, and electrical and pneumatic installations
• Identify electrical or hazard area classifications and determine appropriate procedures to be followed for safe and effective operation
• Identify any need for further study or training in specific knowledge areas

COURSE DETAILS:
Course No.: TS02E
Length: 13 weeks
CEUs: 2.8
Price: 2,380 USD ISA Member
       2,680 USD Affiliate Member
       2,980 USD Community Subscriber/List
       2,380 USD Multi-Registration Rate

Includes ISA Text: CCST® Study Guide Level II—A 39 USD Value!

2019 SCHEDULE
Online ................................ 4 February–3 May;
       1 April–28 June;
       8 July–20 September;
       23 September–20 December

Register or learn more at www.isa.org/COSYTRN
Certified Control System Technician® (CCST®) Level III Exam Review Course (TS03)

This course reviews the knowledge and skills areas included on the Certified Control Systems Technician® (CCST®) Level III certification exam. The intent is to prepare practicing technicians who meet the exam criteria to take the exam. The content is based on the Job Analysis Domains, Tasks, Knowledge Areas, and Skill Areas developed as the basis for the CCST Level III certification exam.

YOU WILL BE ABLE TO:
• Define the scope and format of the CCST Level III exam
• Compare process variable measurements and control valve selections
• Discuss how the various types of control technologies are used in industrial automation, including process control from basic to advanced control, discrete, batch, motor, and motion control
• Determine the requirement for tuning and discuss tuning procedures
• Interpret the best practice methodology for troubleshooting automation projects
• And more…

YOU WILL COVER:
• Field Devices
• Control and Simulation
• Operator Interface and Alarm Management
• Safety, Reliability, and Electrical
• Maintenance Management
• Workflow and Project Leadership

CLASSROOM/LABORATORY EXERCISES:
• Practice CCST exam-style questions

COURSE DETAILS:
Course No.: TS03
Length: 4 days
CEUs: 2.8
Price: 2,380 USD ISA Member

2,680 USD Affiliate Member
2,980 USD Community Subscriber/List
2,380 USD Multi-Registration Rate

Includes ISA Text: CCST® Study Guide Level III—A 39 USD Value

Save on training when you join ISA!
ISA members save 20% and ISA Automation Affiliate members save 10% on the Community Subscriber/List price for all ISA training courses and products.

Register or learn more at www.isa.org/COSYTRN

2019 SCHEDULE
Research Triangle Park, NC ..........18–21 March; 20–23 May
Certified Control System Technician® (CCST®) Level III Online Exam Review Course (TS03E)

This online course reviews the knowledge and skills areas included on the Certified Control Systems Technician® (CCST®) Level III certification examination. The intent is to prepare an automation professional who meets the exam criteria to take the exam. The content is based on the latest Job Analysis Domains, Tasks, Knowledge Areas, and Skill Areas developed, and regularly reviewed and updated, as the basis for the CCST certification exams.

YOU WILL BE ABLE TO:
• Define the scope and format of the CCST Level III exam
• Compare process variable measurements and control valve selections
• Discuss how the various types of control technologies are used in industrial automation, including process control from basic to advanced control and discrete, batch, motor, and motion control
• Determine the requirement for tuning and discuss tuning procedures
• Identify the range of digital communications used in automation and how these are used in system integration
• Explain when safety instrumented systems (SISs) are needed and how they are specified
• Apply the critical areas of regulatory procedures and project documentation
• Interpret the best practice methodology for troubleshooting automation projects

YOU WILL COVER:
• Week 1: Review of Process Information and Process Control Concepts
• Week 2: Documentation—Part 1
• Week 3: Documentation—Part 2
• Week 4: Industrial Measurement and Instrument Performance
• Week 5: Calibration Principles and Procedures
• Week 6: Fundamentals of Instruments—Part 1
• Week 7: Fundamentals of Instruments—Part 2 | Final Control Elements
• Week 8: Troubleshooting | Common Loop Checking Problems | Computer-Based Troubleshooting
• Week 9: Feedback and Advanced Control Strategies | Loop Check Concepts
• Week 10: Programmable Electronic Systems | Fieldbus | Start-up Concerns
• Week 11: Installation in Hazardous Areas | Tuning Methods
• Week 12: Instrument Maintenance
• Week 13: Installation Practices
• Week 14: Project Management | Safety Standards | Cybersecurity
• Week 15: Final Course Examination

COURSE MATERIALS:
• Course notetset with slides from course modules and course syllabus
• ISA Text: CCST® Level III Study Guide—A 39 USD Value!

COURSE DETAILS:
Course No.: TS03E
Length: 15 weeks
CEUs: 3.2
Price: 2,380 USD ISA Member
2,680 USD Affiliate Member
2,980 USD Community Subscriber/List
2,380 USD Multi-Registration Rate

2019 SCHEDULE
Online ................................. 4 March–14 June;
17 June–27 September;
16 September–20 December;
2 December–31 March 2020

Register or learn more at www.isa.org/COSYTRN
Features of ISA Online, Instructor-Assisted E-Courses:

ONLINE PRE-RECORDED COURSE MODULES
Your instructor has pre-recorded each course module so that you can access the course presentations on your schedule. Each module is a web/audio session that takes approximately 60 minutes.

ASK THE EXPERT
Interact with your expert instructor, via email throughout the course and through scheduled live Q&A sessions. You can expect a reply to your email within 24 hours. This email address is active during the entire course duration.

The Q&A sessions provide an opportunity for you and your classmates to speak one-on-one with the instructor. You will have an opportunity to ask any questions you may have about the course material and interact with your fellow classmates.

CLASS DISCUSSIONS
You will be invited to subscribe to a course listserve that includes course participants. You can use this listserve to post questions and share experience relevant to the course with other class members.

COURSE ASSIGNMENTS AND EXAMS
• Take the course pre-test before you begin studying the course material to get a better understanding of areas that you will want to focus on more during the course.
• Homework assignments for all modules will be indicated on the syllabus. The homework assignments are designed to help expand your understanding of the course material.
• Complete the final exam for the course in order to receive Continuing Education Units (CEU) credit. The final exam will be taken and scored online. You must receive at least 80% on the course exam to receive CEU credit.
• Continuing Education Units (CEU) credits are awarded to all students who successfully complete the final course exam.

See the following online courses inside brochure:
• Fundamentals of Industrial Process Measurement & Control (FG05E)—Page 5
• Developing and Applying Standard Instrumentation and Control Documentation (FG15E)—Page 7
• Batch Control Using the ANSI/ISA88 Standards (IC40E)—Page 12
• Certified Control System Technician® (CCST®) Level I Exam Review Course (TS00E—Online)—Page 14
• Certified Control Systems Technician® (CCST®) Level II Online Exam Review Course (TS02E)—Page 16
• Certified Control System Technician® (CCST®) Level III Exam Review Course (TS03E—Online)—Page 18

Features of ISA On-demand, Modular Courses:
—Available Anytime You Are
—Modular—Take One Module Or The Whole Course
—Interactive, Computer-Based With Built-In Knowledge Checks And Quizzes
• Fundamentals of Industrial Process Measurement & Control (FG05M)
  On-demand Course—Page 6