



CS 3000 Batch Training Course 7500



Course Description

The course consists of lectures, demonstrations, laboratory exercises and question and answer sessions designed to familiarize the student with the features and terminology of batch processes, the engineering methodology for automating a batch plant, and the implementation of batch control and recipe management on the CENTUM CS3000 Batch platform.

Duration

5 days

Objectives/Outcomes

Upon completing the course, the learner will be able to exhibit the ability to:

- Describe the unique characteristics of batch processes
- Relate to the terminology and batch control models of ISA standard S88.01
- Express the methodology for engineering a batch control project
- Use the Yokogawa batch software manuals, including on-line documentation
- Design and build Unit Instruments using CS3000 Batch
- Design and build recipe Operations and Phase logic using CS3000 Batch
- Accommodate shared process resources such as pumps and headers
- Build Master Recipes including header, logic, formula data, and equipment requirements
- Create, load, execute, pause, restart and otherwise operate Control Recipes
- Create a batch report which is automatically printed at the end of each batch
- Configure access control security for recipe engineering functions
- Create and display a batch trend

Intended Audience

All Application/Process Engineers responsible for the design, implementation, or application maintenance of a CS3000 Batch control system.

Course Prerequisites

- CS 3000 Engineering - Course #7400

Technical Requirements

- Experience with Basic Process Control and DCS Systems
- Basic file/folder manipulation in a Windows environment

Materials

Each learner will be provided with the appropriate course workbooks and materials. If desired, each student may receive a copy of their completed class laboratory project on CD-ROM for future reference or practice.



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Course Syllabus

Day 1

- Introduction
- Course Objectives, Outline & Schedule
- Characteristics & Control Requirements of Batch Processes
 - Typical Batch Process Equipment
 - Types of Batch Processes
 - Batch Automation Objectives
- Familiarization with Example Process (*hands-on Laboratory*)
- ISA S88.01 Batch Control Models and Terminology
- Additional Batch Automation Concepts
- General Batch Control Engineering Methodology
- Overview of CS3000 Batch Packages
- Familiarization with an Automated Recipe (*hands-on Laboratory*)
- Step-by-Step Activities Involved in Configuring CS3000 Batch
- Simultaneous Execution of Multiple Batches (*hands-on Laboratory*)

Day 2

- Concept of Unit Supervision
- Batch Engineering Activities
 - Identification of Unit Instruments
 - Identification of Shared Resources
 - Assignment of Field Devices to Unit Instruments
- Concept of Plant Hierarchy
- Building a Plant Hierarchy (*hands-on Laboratory*)
- Building Unit Instruments
 - TEAPOT Unit Instrument (*hands-on Laboratory*)
 - PITCHER1 Unit Instrument (*hands-on Laboratory*)
 - PITCHER2 Unit Instrument (*hands-on Laboratory*)
- Management of Shared Resources
- Building Supporting Instruments (*hands-on Laboratory*)
- Concept of Recipe Common Blocks
- Setup of User-Defined Common Blocks (*hands-on Laboratory*)

Day 3

- Derivation of Batch Operations from a Recipe
- Concept of SFC Sequences, Operations & Phases
- SFC Sequence Engineering Builder Screens
- Operation SFC Function Blocks
- Basics of SEBOL Batch Control Language
- Building SFC Sequences (*hands-on Laboratory*)
- Building Operation SFC Instruments (*hands-on Laboratory*)



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Day 4

- Concept of Process Management
- Setup of Process Management Environment (*hands-on Laboratory*)
- Batch Plant Trains and Paths
- Building Trains and Paths (*hands-on Laboratory*)
- Concept of Master Recipes
 - Overview of CS3000 Recipe Handling
 - Recipe Management Engineering Builder Screens
- Building a Master Recipe (*hands-on Laboratory*)
- Overview of Batch Operation & Monitoring Screens
- Loading and Operation of a Control Recipe (*hands-on Laboratory*)

Day 5

- Concept of Exception Handling Logic
- Modification of Master Recipe to Include Exception Handling (*hands-on Laboratory*)
- Operation of Control Recipe with Exception Handling Logic (*hands-on Laboratory*)
- Customizing the State Transition Matrix
- Creating a Custom State Transition Matrix (*hands-on Laboratory*)
- Concept of Batch Reporting
- Batch Report Builder
- Adding a Batch Report to the Master Recipe (*hands-on Laboratory*)
- Access Control Utilities
- Configuring Access Control for Recipe View (*hands-on Laboratory*)
- Batch Trends
- Creating and displaying a Batch Trend (*hands-on Laboratory*)
- Wrap-up, Question-and-Answer

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