

SOLIDWORKS CAM Professional (CSWP-CAM)

Certification Prep Course

Target Audience

This course is designed for manufacturing engineers, CNC programmers, and advanced CAD/CAM professionals preparing for the **SOLIDWORKS CAM Professional Certification Exam**. It is ideal for learners who want to demonstrate proficiency in CAM workflows, feature recognition, advanced milling, turning, and probing operations.

Course Outcomes

By the end of this course, participants will be able to:

- Navigate the SOLIDWORKS CAM interface and workflow.
- Apply Automatic and Interactive Feature Recognition (AFR & IFR).
- Create and manage interactive operations and toolpaths.
- Optimize machining through merging operations, avoid/contain areas, and pattern/mirror techniques.
- Perform advanced milling operations including engraving, curve machining, multi-surface features, and VoluMill.
- Work with assemblies, multi-part setups, and indexed machining.
- Execute turning operations including OD, ID, threading, and double chucking.
- Modify turning parameters and fine-tune toolpaths for efficiency.
- Implement probing for in-process verification and compensation.
- Be fully prepared for the **SOLIDWORKS CAM Professional Certification Exam**.

Course Objectives

- Provide a structured foundation in SOLIDWORKS CAM workflows.
- Train learners in AFR, IFR, and interactive operations.
- Develop proficiency in advanced milling strategies and assembly machining.
- Enable learners to execute turning operations including OD, ID, threading, and double chucking.
- Teach probing techniques for setup verification and compensation.
- Reinforce learning through case studies and hands-on exercises aligned with certification requirements.

Course Outline

The course comprises **56 hours** of theory and labs and is divided into **17 different chapters**. Each chapter will be followed by hands-on lab exercises to reinforce learning and gauge understanding of the topics covered.

Table of Contents

PART 1: FOUNDATIONS

Module 1 — CAM Basics & User Interface

- What is SOLIDWORKS CAM and activating the add-in
- Navigating the CAM user interface
- Understanding CAM workflow
- Working with the CAM Feature Tree
- Operation Plans overview
- Generating toolpaths and simulating tool motion
- Generating NC code output

Module 2 — Automatic Feature Recognition (AFR)

- How AFR identifies machinable features
- Feature strategies and operations
- Modifying operations (reordering, deleting, replacing)
- Modifying parameters (feeds, speeds, depths, stepovers)
- Handling design changes and updating CAM tree
- Regenerating toolpaths after modifications

Module 3 — Interactive Feature Recognition (IFR)

- When and why to use IFR
- Creating 2.5 axis features (pockets, slots, bosses)
- Defining part perimeter features
- Configuring mill part setups
- Setting work coordinate offsets
- Using selection filters for geometry control
- Combining AFR and IFR

Module 4 — Interactive Operations

- Creating interactive 2.5 axis mill operations
- Selecting and configuring tools manually
- Controlling cut patterns, depths, strategies
- Saving operation plans for reuse
- Applying saved plans to new parts

Module 5 — Merging Features & Operations

- Creating feature groups for similar geometry
- Combining operations to reduce tool changes
- Linking operations for optimized rapid moves
- Combining selected operations for specific features
- Reducing cycle time through operation management

Module 6 — Avoid & Contain Areas

- Defining avoid areas (clamps, fixtures, sensitive features)
- Defining contain areas to restrict tool motion
- Applying avoid/contain to specific operations
- Verifying toolpaths respect boundaries

Module 7 — Pattern Features & Mirror Toolpaths

- Creating linear patterns
- Creating circular patterns
- Creating sketch-driven patterns
- Mirroring toolpaths for symmetric geometry
- Reducing programming time with pattern/mirror techniques

PART 2: ADVANCED MILLING

Module 8 — Advanced Features & Operations

- Creating engrave features for text/logos
- Defining curve features for non-prismatic geometry
- Machining multi-stepped holes (counterbores, countersinks)
- Tap operations and thread milling
- Corner round and chamfer machining
- Creating multi-surface features for complex 3D geometry

Module 9 — Configurations

- CAM product configuration overview
- Working with part configurations
- Managing toolpaths across multiple configurations
- Generating separate NC code per configuration

Module 10 — High Speed Machining (VoluMill)

- VoluMill overview and benefits
- Setting up VoluMill toolpaths
- Configuring VoluMill-specific settings (engagement angle, chip load)
- Using VoluMill Technology Expert for optimization
- Comparing cycle times and tool wear

Module 11 — Assembly Machining

- Assembly mode overview
- Machining with fixtures and vises
- Using Part Manager and Stock Manager
- Configuring setup parameters in assembly context
- Programming with subroutines
- Machining multiple parts in a single setup
- Importing part data between assemblies
- Split instance and split setup workflows

Module 12 — 3+2 (Indexed) Machining

- Understanding 3+2 machining concepts
- Setting up indexing for multi-face machining
- Programming features on non-top faces

- Assembly machining with tombstone fixture
- Managing coordinate systems across indexed setups

PART 3: TURNING & SPECIALIZED TOPICS

Module 13 — Turning Basics

- Turning environment overview
- Turning process workflow
- Defining setup and spindle orientation
- Configuring chuck and fixture settings
- Defining stock shape and dimensions
- Automatic recognition of machinable turn features
- Generating turning toolpaths and NC code

Module 14 — Interactive Turn Features & Operations

- Creating new turn features manually
- Defining OD and face features interactively
- Selecting and configuring turning tools
- Controlling cut depths, passes, strategies

Module 15 — Chucks, ID Features & Double Chucking

- Section methods (plane section)
- Setting up double chucking for two-sided machining
- Defining and machining ID features
- Managing OD and ID operations in a single program

Module 16 — Modifying Turn Parameters & Toolpath Editing

- Creating custom chuck definitions
- Customizing OD feature parameters
- Defining and modifying thread features
- Directly editing turning toolpaths
- Fine-tuning tool motion for surface finish and cycle time

Module 17 — Probing

- Introduction to in-process probing
- Probe operation types and use cases
- Creating and configuring probe operations
- Part setup verification with probing
- In-cycle measurement and compensation