CNC Turning Technology

Catalogue Number	88-3097-0000
Category	CNC
Duration	15 Hours

Activity 1: Introduction and Safety

What is CNC?

What is a Lathe?

BenchTurn 7000 Turning Center

Machining Safety

Activity 2: CNCMotion Control Software

CNCMotion Control Software

Task: Running CNCMotion

CNCMotion Window Components

Task: Changing Jog Control Settings

CNCMotion Working Modes

Program Window

Task: Saving a Program

Task: Unlocking a Program

3D Image Window

Controlling the Hardware

Task: Adjusting the View of the Lathe

Activity 3: Securing the Workpiece

- Steps Required to Turn a Part
- Workpiece Structure
- Fixtures
- Using the Mechanical Chuck
- Task: Using the Mechanical Chuck
- Quiz
- Coordinate Systems
- Defining the Workpiece
- Manipulating the Cross-Slide
- Task: Manipulating the Cross-Slide

Activity 4: Tooling

- Steps Required to Turn a Part
- CNC Turning Operations
- CNC Turning Tools
- What is the Tool Turret?
- Aligning the Tool
- Tool Definition
- Task: Defining Tools in the Control Program
- Task: Selecting a Tool for Use
- Rotating the Workpiece Task: Operating the Turning Center

Activity 5: Reference Positions

- Steps Required to Turn a Part
- Introduction to Reference Positions
- Machine Coordinates
- Task: Homing the Lathe
- Workpiece Coordinates
- Task: Preparing the Turning Center
- Task: Touching Off the Stock (Z)
- Task: Touching Off the Stock (X)
- Task: Verifying the Workpiece Origin

Activity 6: Verifying a Program

- Steps Required to Turn a Part
- Numerical Control Programs
- Program Verification
- Verification View Settings
- Task: Defining the Viewing Options
- Verification Stock Settings
- Task: Defining the Stock Settings
- Task: Defining the Tool
- Task: Verifying the Program
- Task: Verifying the Program with Another Tool
- Runtime Estimation
- Task: Estimating the Runtime

Activity 7: Machining a Part

- Steps Required to Turn a Part
- Performing a Dry Run
- Run Parameters
- Task: Preparing the Turning Center
- Task: Setting the Workpiece Origin
- Task: Verifying the Program
- Task: Performing a Dry Run
- Turning the Part
- Task: Machining a Part

Activity 8: Introduction to NC Programming

- Developing Numerical Control Programs
- Computer Aided Design and Manufacturing
- Developing an NC Program
- Sketching the Part to Scale
- Part Drawings for Turning Operations
- Task: Sketching the Part to Scale on Graph Paper
- Programming Modes
- Determining the Tool Path
- Task: Determining the Tool Path with Absolute Coordinate Values
- Quiz
- NC Programming Overview
- Address Characters
- Machine Commands: X and Z
- G-Codes: Programming Mode Subgroup
- Task: Writing the Program
- Task: Verifying the Tool Path

Activity 9: Programming the Taper

- Linear Interpolation
- G-Codes: Interpolation Subgroup
- Efficient Programming
- Task: Adding Interpolation Commands
- M-Codes: Miscellaneous Operations
- Machine Commands: Tool Parameters Subgroup
- Task: Completing the Program
- Suggestions for Block Structure
- Task: Fine-Tuning the Program
- Task: Verifying the Program Code

Activity 10: Machining the Taper

- Steps Required to Turn a Part
- Required Steps
- Program Readability
- Task: Adding Comments to the Program
- Task: Verifying the Program
- Task: Preparing the Turning Center
- Task: Preparing to Perform a Dry Run
- Task: Performing a Dry Run
- Task: Turning a Part

Activity 11: Arc Programming

- Programming Circular Movements
- Task: Defining the Tool Path
- Task: Writing the Program
- Task: Verifying the Program
- Task: Preparing to Perform a Dry Run
- Task: Performing a Dry Run
- Task: Machining the Part

Activity 12: The Spinning Top

- Task Description
- Task: Sketching the Part to Scale
- Task: Determining the Tool Path
- Task: Writing the Program

Activity 13: Machining with Multiple Tools

- Tool Offsets
- Task: Updating the Program
- Task: Preparing the Turning Center
- Task: Defining Tool Offsets
- Task: Preparing to Perform a Dry Run
- Task: Performing a Dry Run
- Task: Machining the Part

Activity 14: Final Project

- Final Part Specifications
- Task: Defining the Tool Path
- Task: Writing the Program
- Task Description
- Post-test