Introduction to CNC Routers

COURSE OUTLINE
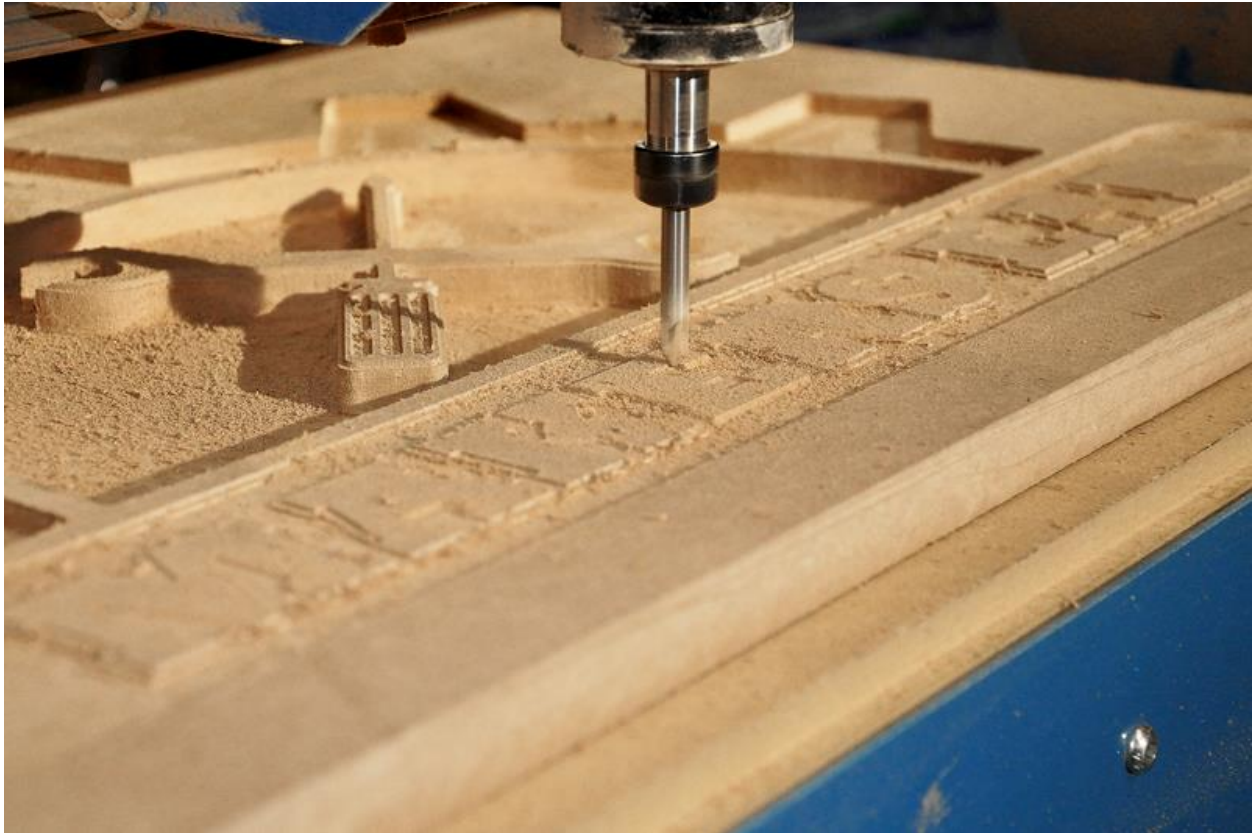
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Introduction to CNC Routers

Catalog Number	77-8160-0002
Category	CNC
Duration	12 Hours
Software Supplied	**VCarve Pro** Router Cutting and Design Software
	Mach3 Router Control Software

LESSON 1: INTRODUCTION TO CNC

- Duration: 2 Hrs

Outline:

1 Introduction to CNC

What can I make with a CNC?
What is CNC?
CAD - Computer Aided Design
CAM - Computer Aided Manufacturing
CNC - Machining the Part
CNC Control

2 Coordinate Systems

Coordinate Systems
Coordinate Measurement
Origins and Axes
Three-Dimensional Measurement
Coordinates and CNC Programming
Editing CNC Programs
The Right-Hand Rule

3 Using the CNC Router Safely

Introduction
Machining Safety

4 Setup and Tooling

Setting Up the Router Hardware
Fixtures and Spoilboards
Dust Collection
Workholding
Installing the Material
Tooling
Chipload
Depth of Cut
Installing the Tool

5 Setting The Origin

Setting the Work Origin
CNC Control

6 Running a Sample Program

Setting up the CNC Router
Cutting the Part
Loading the G-Code
Testing the Program
Running the Program

7 CNC Code Reference

PROJECT 1: 3D SIGN

- Duration: 2 Hrs

Outline:

1 Drawing with VCarve PRO

Creating a drawing file
The Drawing panel
Drawing the Outer border
Drawing the border
Adding text
Aligning text
Adding 3D Objects

2 Setting up Toolpaths

Setting up the Material
Setting up the Tool
Adding Tabs
Adding Tabs
Previewing the Toolpath

3 Setting up the Toolpaths

Creating the Pocket Toolpath
Creating the 3D Finishing Toolpath
Creating the Border Toolpath
Saving Toolpaths for CNC

4 Setting up the CNC Router

Setting up the CNC Router
Loading the G-Code
Preparing for the Dry Run
Dry Run the Program

5 Cutting the Part

Cutting the Pocket
Cutting the 3D Paths
Cutting the Outside Border
Removing the Part
Finishing the Part

PROJECT 2: CLOCK

- Duration: 2 hrs

Outline:

1 Creating a drawing file

Setting up the Drawing
Drawing the Clock Face
Drawing the Interior Art
Shaping the Base of the Clock Face
Drawing the Base

2 Creating and Saving Toolpaths

Creating the Toolpaths
Setting up the Tool

3 Setting up the CNC Router

Setting up the CNC Router
Loading the G-Code
Preparing for the Dry Run
Dry Run the Program

4 Cutting the Part

Cutting the Pocket
Engraving Text
Cutting the Outside Borders
Removing the Part
Assembling the Clock
Finishing the Part

PROJECT 3: MAKERS LAB SIGN

- Duration: 3 hrs

Outline:

1 Importing Artwork

Importing Artwork
Setting up the file

2 Working with Vectors

Working with Vectors
Setting up the Tool

3 Creating the Toolpaths

Creating the Toolpaths
Setting up an Engraving Tool
Adding Color
Previewing the Final Cut
Saving Toolpaths for CNC

4 Cutting the Part

Setting up the CNC Router
Loading the G-Code
Preparing for the Dry Run
Dry Run the Program
Cutting the Part
Cutting the Outside Border
Finishing the Part
Removing the Part

PROJECT 4: 3D ROBOT

- Duration: 1 hr

Outline:

Creating a Drawing
Importing the 3D Object
Drawing Vectors
Creating Toolpaths
Saving Toolpaths for CNC
Cutting the Part
Finishing the Part

PROJECT 5: MODEL DINOSAUR

- Duration: 2 hrs

Outline:

Creating a Model Dinosaur

3D Model Dinosaur
Creating a Drawing
Importing CAD Drawings
Working with the CAD Drawings
Drawing Assembly Slots

Laying Out the Drawing
Creating Toolpaths
Drawing Assembly Slots
Loading the Toolpaths in Mach3 CNC
Setting up the CNC Router
Cutting the Part
Finishing the Part