

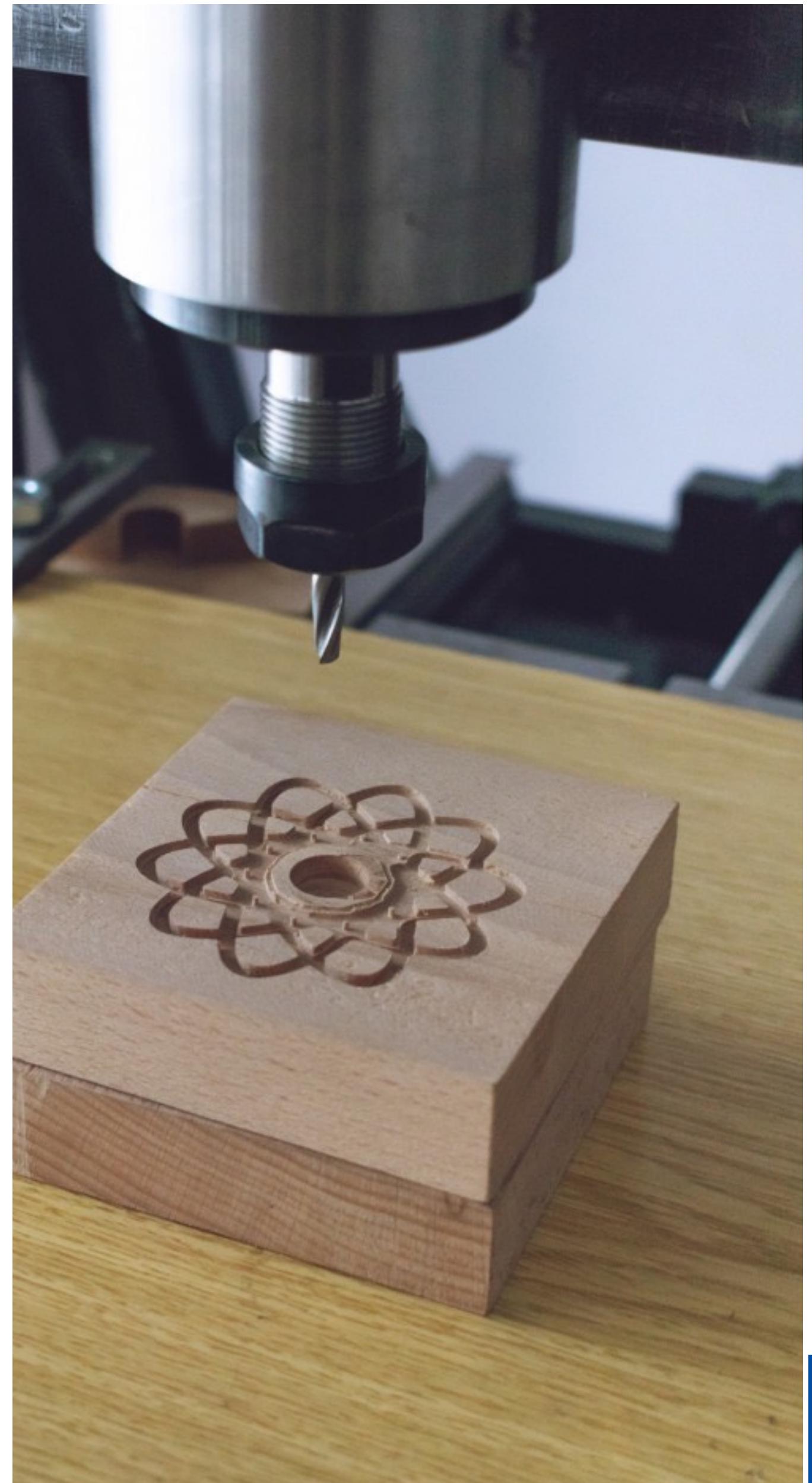
# Introduction

This course introduces you to the foundational knowledge in computer-aided design, manufacture, and the practical use of CNC machines, Laser Cutters and 3D Printers. In this course we begin with the basics in Autodesk® Fusion 360™ CAD by learning how to properly sketch and model 3D parts. Before we program any toolpaths, we'll explore basics of CNC Routers, Laser Cutters and 3D Printers, to ensure we have the ground level foundational knowledge needed to take full advantage of the machines at hand. Furthermore, we'll take a look at the same basic process that gets repeated for the design and manufacture of any part and is a critical step in learning and understanding the process.



# This Course

- Autodesk® Fusion 360™ Foundational Design Concepts
- Designing for Manufacture
- Laser Cutting
  - How to format files for laser cutting
  - Get an overview of laser cutting terminology, machine settings, and the basics of laser safety
  - Learn which materials are best suited for laser cutting and which materials are unsafe to cut
- Additive Manufacturing
  - Design for additive manufacturing
  - Slicing Softwares
  - Setting up printing jobs
  - Printing Prototypes
- CNC Machining
  - Setting up a CNC milling program
  - Setting up CAM Programs
  - Machining complex geometry



# Who You'll Meet

- Highly qualified Engineering faculty with vast theoretical knowledge and massive hands on experience
- Experts in digital designing, manufacturing and fabrication processes
- Highly skilled academics and industry leaders

# What You'll Experience

- An in-depth series of online/offline lectures, with high-quality graphics & detailed descriptions.
- Hands-On machining and manufacturing experience through multitudes of real life projects with real life applications
- Interactive sessions with academic & industry experts, capturing cutting-edge perspectives



# What You'll Use

- AutoDesk Fusion 360
- CNC Routers
- Laser Cutters
- 3D Printers



# Course Instructor

## Muhammad Usama

Muhammad Usama (Mechanical Engineer) is the Instructor for the vocational training program ( Digital Design, Manufacturing and Fabrication) at Emerging Technologies Hunar 2.0.



# Course Structure

## Autodesk® Fusion 360™

3  
Weeks

- Sketching and Modelling
- Sculpt and Sheet Metal
- Render
- Animation
- Drawing
- Simulation
- CAM and 3D Printing Resources

## CNC Router CAD/CAM

6  
Weeks

- Getting started and what is CNC?
- CAM Basics
- CNC Tools
- Toolholders
- Workholding
- Feeds and Speeds
- Setup CAM in Fusion 360™
- Setup CAM in V Carve Pro
- Machining Wood
- Machining Plastics
- Machining Soft Metals

## Additive Manufacturing

4  
Weeks

- Introduction to Additive Manufacturing
- Additive Manufacturing Processes
- Applications of Additive Manufacturing
- Design for Additive Manufacturing
- Additive Manufacturing Software
- Cost and Value of Additive Manufacturing

## Laser Cutting

5  
Weeks

- Introduction to Laser Cutting
- Setting Up Your Machine
- Toolkit
- Types of Lenses and Their Uses
- Laser Settings
- Roaster vs Vector
- Color Mapping
- Material Library