

# Integrative STEM Education

## CNC Mill

**FESTO**



### Highlights

- Design CAD models
- Generate/execute programs on the CNC mill
- Demonstrate the CNC engraving process
- Create a prototype of a mechanical puzzle
- Program in G-code
- Create a passive phone speaker
- Design innovative solutions to real-world problems, challenges, and needs

### STEM Connections

In the STEM CNC Mill course, students discover how the four disciplines connect as they design and produce prototypes. Once they are familiar with CNC milling, they'll have the opportunity to design innovative solutions to real-world problems, challenges, and needs.

### Science

- Density, volume, force, and pressure
- Mechanics
- Electronics

### Technology

- Windows-based graphical user interface
- 2D/3D software application
- CNC mill machine
- G & M code

### Engineering

- Design and development of parts and products
- Design evaluation and design changes to improve products
- Application of orthographic projection concepts to 2D standard views and isometric views
- Engineering design process

### Math

- Units of measurement
- Subtracting material
- Perpendicularity
- X-Y-Z coordinate systems
- Angular measurements
- Geometry

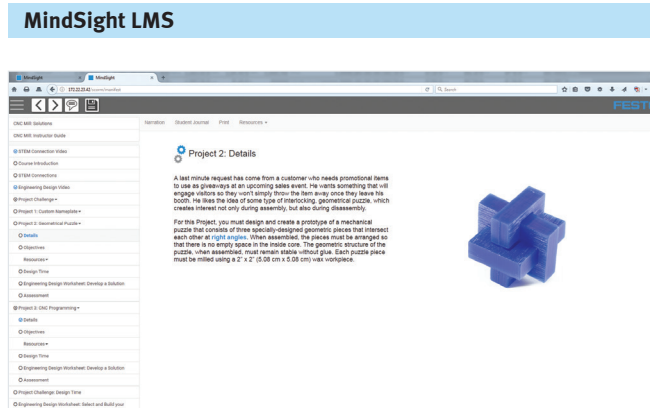
# Integrative STEM Education

## CNC Mill

### STEM CNC Mill

The purpose of the STEM Computer Numerical Control (CNC) Mill course is to provide learners the opportunity to design, create, and evaluate prototypes: all very important steps in the manufacturing process.

Learners will be challenged to design and prototype products by taking on the role of a CNC designer/programmer. Learners must adhere to the specifications and constraints given, as well as explore and practice the CAD and CAM software, and their interactions with a CNC machine, to be the designers of new products.



Upon completion of the STEM CNC Mill course, students will be able to:

- Recognize the function and features of a CNC mill machine.
- Identify CNC end mills and end mill holders.
- Design digital models using CAD software.
- Generate PART programs.
- Select the correct end mill based on design specifications.
- Position the milling tool on a CNC mill.
- Execute programs on the CNC mill using CNC Mill software.
- Operate a CNC mill machine using various workpieces.
- Identify basic motion types in a CNC machine.
- Develop CNC programs in G & M code.
- Explain the connection between sound waves and acoustic design.
- Apply the engineering design process.

### Equipment and Supplies

- Multimedia presentation
- MindSight installation and user guide
- Fabricus software
- CNC Mill software
- 5400 CNC mill (plus accessories)
- End mill 125
- End mill 250
- End mill 062
- End mill holder (3)
- Wood shims
- Hex key 094
- Hex key 156
- Rubber mat
- Emory board
- Workpieces: Wax 2" x 2" x .5"
- Workpieces: Lexan™ 3" x 3" x .5"
- Workpieces: Protofoam 4" x 2" x 1.5"
- Workpieces: Plexi 3" x 6" x .5"
- Workpieces: Plexi 0.5" x 1.6" x 24"
- Safety glasses

For more information or to set up a complimentary consultation:

**Festo Didactic Inc.**

Eatontown, NJ 07724  
Phone: +1-732-938-2000  
Toll Free: +1-800-522-8658  
Fax: +1-732-774-8573