

# Manufacturing Technology I

**Manufacturing Technology is a self-directed course which requires students to stay on task without direct Teacher intervention. Detailed instruction is available as needed but students have to be aware that they are in charge of their work and as such are responsible for requesting help when needed and must complete all of the requirements listed here in order to earn a passing grade in this course.**

Course Requirements:

CNC Router; Students should be familiar with the design and operational software for the CNC router. This includes but is not limited to the following;

1. Design of simple projects using VCarve Pro.
2. Creation of toolpaths including the following;
  - a. Pocket toolpaths.
  - b. Profile toolpaths.
  - c. Drilling toolpaths.
  - d. V Carve toolpaths.
  - e. Inlay toolpaths.
  - f. Importing bitmaps and the creation of vectors.
3. Students must show proficiency in the start-up of the CNC as well as general operating principles such as bit changes, setting X and Y axes zero points and Setting the Z axis Zero position.
4. Students must complete two of the project tutorials including but not limited to the 3.5 inch coaster project and the inlay project.
5. A minimum of 3 individual projects must be completed which are designed by the student and created on the CNC machine.

**Students will be required to complete the online testing covering CNC Set-up and Operation.**

CO2 Laser Requirements: Students should be familiar with the design and operational software for the CO2 Laser. This includes but is not limited to the following;

1. Design of simple projects using RD Works V8.

2. Creation of student designed projects using the following techniques;
  - a. Custom design using RD Works software.
  - b. Import of a bitmap or jpeg image to use in the design of a project.
  - c. Creation of a series of projects using multiple materials such as solid wood, plywoods, plastics (acrylics), leather, anodized metals...

All of the above requirements must be documented with the following information;

1. Time needed to design each project. This should be in the form of the actual amount of time needed to perform all of the processes associated with preparing work for use in a machine.
2. Prep time for materials used in a project.
3. Actual machining time.
4. Machine settings used in the production of a product.
  - a. CNC users should record bit speeds and feeds along with bit types used, material machined, time needed for machining and a recording of detailed results information such as quality of machining, mistakes made, changes considered for future machining.
  - b. Laser users should record materials used, cut and scan settings with accompanying results.