

 **Technology Education Standards**

**Fab Lab Entrepreneurship**

**Course Overview: This is a hands-on course where students will use the Digital Design and Fabrication Process. This includes learning and using the 2D and 3D design software, and a variety of machines vinyl cutters, laser cutter, mini-mills, 3D printers, and CNC routers to create products that can be marketed and sold.**

**Team Taught:** The Fab Lab Entrepreneur course will be taught in conjunction with the Marketing class and the school store.

**Unit 1: Safety Unit** **(4 day and ongoing)**

**Description:**  Learn what we must know to insure everyone’s safety in the Fab Lab

**Standards**

1. The students will be able to demonstrate proper use and inspection of personal protection equipment (PPE). MnF1.a.7.h

2. The students will be able to demonstrate proper safe operation practices in work area. MnF1.a.7.h

3. The students will be able to demonstrate proper use and inspection of ventilation equipment. MNF1.g.11.h

4. The students will be able to demonstrate proper “Work Zone” operation. MNF1.g.11.h

5. The students will be able to demonstrate proper use of precautionary labeling and MSDS information. MnF1.a.7.h

6. The students will be able to safely demonstrate the proper use of all shop tools and equipment (maintain a personal safety license). MnF1.a.7.h

7. The students will take the responsibility to get trained on the safe and proper operation of all Fab Lab equipment as needed. MnF1.a.7.h

**Unit 2: Machine Functions (4-5 weeks, ongoing)**

**Description:** The unit will cover the proper setup and safe proper use of any Fab Lab equipment needed to produce a desired product for sale

**Standards**

1. The students will be able to properly operate the DiVinci and AirWolf three dimensional printers. MNF1.h.7.h
2. The students will be able to properly operate the Epilog Laser MNF1.h.7.h
3. The students will be able to properly operate the EZ-Router CNC Plasma table. MNF1.h.7.h, MNF1.h.9.h
4. The students will be able to properly operate the EZ-Router CNC router table. MNF1.e.8.h
5. The students will be able to properly operate the Tormach CNC Milling Center. MNF1.e.8.h
6. The students will be able to properly operate the Roland Vinyl cutter. MNF1.e.8.h

 **Unit 3:**  **(12 Weeks, ongoing)**

**Description:** This unit will develop the students’ abilities to use the equipment in the Fab Lab to design, built and produce projects for sale.

**Standards**

1. The student will be able to design a product for sale. MNF1.e.7.h, 4C1.a.8.h
2. The student will be able to create a production design, plan and process for a product to sell. 4C1.a.7.h
3. The student will be able to run a production (assign and monitor workers) for their product to sell.
4. The student will be able to design a useful design on a sticker material using Corel Draw and Cut Studio Pro to be cut on the Vinyl Cutter. 4C2.a.11.h
5. The student will be able to use Corel Draw software to design a project with a rastered and vectored image to be cut on the Epilog Laser Engraver. 4C2.a.11.h, 4C2.a.16.h
6. The student will be able to use Sketch Up software to design their product to sell. 4C3.b.9.h
7. The student will be able to use measurement tools accurately to product woods and metals products. MNF1.a.9.H
8. The students will be able to functionally use all the specific software programs needed in the Fab Lab course and be able to convert and save from one program to others. ICT1.c.7.h, ICT1.c9.h
9. The student will be able to use multiple software and the CNC Router Table to create a useful, saleable product MNF1.d5.h
10. The student will be able use multiple software and the CNC Plasma Table to create saleable, useful objects. MNF1.e.8.h

 **Unit 4: (3-4 Days)**

**Description:** This unit will develop the student’s knowledge of related careers

**Standards**

1. The student will be able to research occupations related to Manufacturing. CD3.a.10.h
2. The student will be able to use their skills learned in class to design and product a product for another Technology education course. (entrepreneurship) CD3.a.10.h, MNF.1.b.5.h
3. The student will review their results from the Career Cruising web site to compare skills to this course. CD3.a.10.h

**Unit 8: Occupational Orientation (ongoing)**

**Description:** this unit is an ongoing unit to demonstrate what are some important employability skills in the working world?

**Standards**

1. The students will be able to prepare work reports or records. ENG4.b.5.h, MNF1.c.6.h
2. The students will be able to perform housekeeping duties. MNF1.c.6.h, MNF1.c.9.h
3. The students will be able to follow verbal and written instructions to complete work assignments. MNF1.c.6.h, MNF1.c.7.h
4. The students will be able to use work time efficiently. MNF1.c.6.h
5. The student will be able to use critical thinking skills to problem solve assignments. ENG4.b.5.h, MNF1.c.10.h