Introduction to Fab Lab Technology

Course Design

2018-2019

Course Information

Division: Industrial Technology Education
Course Number: AMT 110
Title: Introduction to Fab Lab Technology
Credits: 2
Developed by: Dorian R. Nelson and Nathan McCray
Lecture/Lab Ratio: 1 Lecture/2 Lab
Transfer Status: ASU Non Transferable, NAU CTE Departmental Elective, UA Non Transferable

Activity Course: No
CIP Code: 48.0503
Assessment Mode: Portfolio
Semester Taught: Fall and Spring
GE Category: None
Separate Lab: No
Awareness Course: No
Intensive Writing Course: No
Diversity and Inclusion Course: No

Prerequisites

None

Educational Value

Introduces high-demand skills in maintenance and safe operation of high-tech manufacturing equipment.

Description

Successful completers of this course will qualify to work in the Fab Lab with supervision. This course introduces participants to concepts and tools used in a Fab Lab environment. Students learn proper safety procedures, machine setup, and operation of key Fab Lab equipment. Participants will work collectively to keep the lab safe, organized, and clean.

Supplies

No lab fees. Materials for personal projects must be provided by students.
Competencies and Performance Standards

1. Demonstrate safe and competent setup and operation of Fab Lab equipment.

Learning objectives

What you will learn as you master the competency:

a. Demonstrate the ability to safely use the manufacturing equipment.
b. Identify material cost, tooling cost and machine run cost for each project.
c. Acquaint self with proper machine setup, operation, and maintenance.
d. Demonstrate ability to properly set-up and operate each Fab Lab machine to produce part(s).

Performance Standards

Competence will be demonstrated:

- in oral quiz and discussion
- in lab exercises and performance

Your performance will be successful when:

- learner is productive, works safely and in a professional manner while working on task requirements for each Fab Lab equipment and in the lab area
- learner properly sets-up Fab Lab equipment to make single dimension part or cut
- learner operates each Fab Lab equipment according to strict machine protocols
- learner cleans work area and performs routine maintenance and inspections on EAC Fab Lab equipment
- learner attends required class and lab sessions and shows up on time

2. Recognize various types of materials which can be used in Fab Lab applications.

Learning objectives

What you will learn as you master the competency:

a. Identify typical materials that can be safely used in EAC’s Fab Lab.
b. Identify material cost to produce a small two dimensional part using each Fab Lab.

Performance Standards

Competence will be demonstrated:

- in assignments

Your performance will be successful when:

- learner provides acceptable cost analysis on selected parts provided
- learner identifies correct materials useable on machines

3. Identify the limits and operational cautions while using all Fab Lab equipment.

Learning objectives

What you will learn as you master the competency:

a. Understand and acquaint self with each machine’s operational manual.
b. Demonstrate an understanding of operational procedures outlined in Fab Lab operation manuals and follow operational checklists.
Performance Standards

Competence will be demonstrated:
- in oral discussion
- in lab activities demonstrating an understanding of basic machine operation per competency check list on each equipment in Fab Lab

Your performance will be successful when:
- learner is successful during a dry run process in each Fab Lab machine
- learner utilizes guidance from Fab Lab technician for any project’s first run on Fab Lab’s equipment

4. Produce a useable product using varying Fab Lab equipment.

Learning objectives

What you will learn as you master the competency:
- Demonstrate ability to properly set-up and produce a multi-dimensional part using one or various Fab Lab equipment.
- Perform proper clean-up and maintenance on machines, and also resets equipment correctly so it is ready for the next user.

Performance Standards

Competence will be demonstrated:
- in writing assignments
- in lab activities

Your performance will be successful when:
- learner produces a product or part with recognizable form and function
- learner is successful while using the Fab Lab equipment
- learner utilizes guidance from Fab Lab technician to ensure Fab Lab equipment is being used properly during fabrication process
- learner properly and safely produces a small part or product

Types of Instruction
Discussion/Demonstration

Grading Information

Grading Rationale

Students will be evaluated on their ability to follow proper industry safety procedures, machine tool setup and operation, and to manufacture course projects using available lab equipment.

Grading Scale
A 90%-100%
B 80%-89%
C 70%-79%
D 60%-69%
F Below 60%