

LINC 402: BASIC MAKERSPACE SKILLS II

Foothill College Course Outline of Record

| Heading | Value |
|------------------------------------|--|
| Effective Term: | Summer 2023 |
| Units: | 0 |
| Hours: | 3-360 hours laboratory total per quarter. |
| Advisory: | Basic computer skills and knowledge of operating systems; familiarity using web browsers, email, bookmarking, searching and downloading. |
| Degree & Credit Status: | Non-Degree-Applicable Non-Credit Course |
| Foothill GE: | Non-GE |
| Transferable: | None |
| Grade Type: | Non-Credit Course (Receives no Grade) |
| Repeatability: | Unlimited Repeatability |

Student Learning Outcomes

- Demonstrate basic tool safety and functions.
- Develop a prototype utilizing basic concepts and equipment skills.

Description

Introduces students and other individuals to the tools and skills used in makerspaces. These skills include, but are not limited to: basic machine safety, basic computing concepts, basic electronics. Students learn independently and in groups to enhance their personal skills in using tools safely and effectively to create and build items for personal and educational uses. After completing the two-course sequence of LINC 401 and 402, students will receive badges for each machine/tool in safety and basic use. Students will be more prepared for entering STEM and maker career paths in education, community centers, and libraries. This course cannot be taken for credit.

Course Objectives

The student will be able to:

1. Identify specific machines typically found in makerspaces and their usage
2. Demonstrate specific use cases and safe operation of specific tools/machines
3. Demonstrate tool/machine knowledge required to use the tool/machine effectively, including the creation of digital files required by the machine
4. Identify tool/equipment uses in hobby, prototyping, and industrial environments

Course Content

This course encompasses several makerspace areas, focused on safety, computing, and electronics.

1. Basic machine safety (machines not covered in LINC 401)
2. Basic tool functions and work products
3. Safety procedures and use processes
4. Sample project ideas and demonstrations
5. Uses in hobby, prototyping, and industrial contexts
6. Basic computing concepts
 - a. Basic connections to electrical (battery/AC power) sources, including ground and safety precautions
 - b. Uses of small computers in simple contexts, including the connection of sensors and other peripherals to increase functionality
 - c. Demonstrate the use of small computers in daily life, including devices connected to the internet
 - d. Uses in hobby, prototyping, and industrial contexts
7. Basic electronics
 - a. Understanding of basic electrical concepts, including the connection of power to devices through batteries or AC power
 - b. The use of a multimeter to test electrical voltage from a battery or AC power and continuity of wires/circuits/connections
 - c. Basic knowledge and use of electrical components, including transistors, capacitors, and resistors
 - d. Demonstration of the basics relating to circuits and soldering
 - e. Uses of electronics in hobby, prototyping, and industrial contexts

Lab Content

1. Practice using advanced makerspace machines and tools for different projects and purposes
2. Practice machine care and maintenance procedures, including safe operation of all machines
3. Practice applying computing and electronics concepts to meet varying project requirements

Special Facilities and/or Equipment

1. Makerspace equipment, including, but not limited to: CNC routers and lathes, 3-D printers, power tools, hand tools, soldering irons, small electronics (Arduino, Raspberry Pi, Microbit).
2. When taught via the internet: students must have current email accounts and ongoing access to computers with web browsing capability and internet access.

Method(s) of Evaluation

Methods of Evaluation may include but are not limited to the following:

Student participation in digital badging activities
 Demonstration of required tool/equipment knowledge and the use of digital tools to interact with tools and equipment
 Demonstration of required skill to appropriately and safely use tools and equipment
 Documentation of work products using digital tools, including desktop computers, software, and cameras

Method(s) of Instruction

Methods of Instruction may include but are not limited to the following:

The student will be listening actively to lecture presentations delivered in student-centered learning style by taking notes, following demonstrations, or completing an activity

The student will be participating in facilitated discussions of live presentations, readings, or video presentations

The student will be presenting in small group and whole class situations

Representative Text(s) and Other Materials

Instructor-assigned notes, materials, and resources, including instructional materials, open education resources, multimedia, and websites.

Types and/or Examples of Required Reading, Writing, and Outside of Class Assignments

1. Example reading assignment: Students will read, both in print and online, manuals and instructions relating to the appropriate and safe operation of a tool. Additionally, there will be written material which will accompany either video or direct instruction
2. Example writing assignments: Students will write responses to questions regarding the appropriate use of a tool, as well as describe specific use cases in hobby, prototyping, and industrial settings

Discipline(s)

Interdisciplinary-Basic Skills: Noncredit