LINC 84B: 3-D DESIGN & FABRICATION

Foothill College Course Outline of Record

Heading	Value
Effective Term:	Summer 2023
Units:	2
Hours:	2 lecture per week (24 total per quarter)
Advisory:	Experience with internet software tools, browsers, hyperlinks, online media resources, and basic skills using a computer.
Degree & Credit Status:	Degree-Applicable Credit Course
Foothill GE:	Non-GE
Transferable:	CSU
Grade Type:	Letter Grade (Request for Pass/No Pass)
Repeatability:	Not Repeatable

Student Learning Outcomes

- Identify different types of 3-D fabrication techniques.
- Access, download, and modify 3-D printing files from online collections.

Description

Intended for educators and others, this course provides the fundamentals of 3-D design and fabrication concepts. Basic design software and online libraries are used to assist in developing and designing 3-D projects for learning projects by students in grades K-12, business, industry, and/or governmental. An emphasis is placed on design concepts to meet a specific educational/instructional/project need.

Course Objectives

The student will be able to:

1. Identify different types of 3-D fabrication techniques
2. Access, download, and modify 3-D printing files from online collections
3. Evaluate the best media for the 3-D print job based on the use requirements
4. Establish design criteria and scale to maintain interoperability for multiple part projects
5. Develop and submit a finished 3-D fabricated item

Course Content

1. 3-D fabrication techniques
    a. 3-D printing—filament based (PLA/ABS)
    b. 3-D printing—resin based
    c. 3-D printing—CNC
    d. Laser cutting
2. Online 3-D printing collections
    a. Thingiverse
    b. Tinkercad
    c. Inventables
3. Types of media used in 3-D fabrication
    a. Filament (PLA/ABS)
    b. Resin
    c. Wood
    d. Plastic sheeting
4. Design criteria
    a. Material
    b. Size
    c. Strength
    d. Weight
    e. Accuracy
5. Finishing and assembly
    a. Techniques to remove excess material
    b. Dry fitting multiple piece projects to ensure proper fit

Lab Content

Not applicable.

Special Facilities and/or Equipment

1. When offered on/off campus: Lecture room equipped with projector, whiteboard, and a demonstration computer connected online. Computer laboratories equipped with computers or laptops with internet access.
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:

Developing a project utilizing 3-D design and fabrication technologies
Presenting their design and project to peers
Making constructive contributions to class discussions and peer reviews

Method(s) of Instruction

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

Lecture presentations delivered in student-centered learning style, during which students take notes, follow demonstrations, or complete an activity

Facilitated discussions of live presentations, readings, or video presentations
Student presentations 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. Reading assignments include analysis of texts, selected examples, and student projects
2. Writing assignments include a course project and multiple developmental projects, reflections, discussion responses, and peer feedback on projects
3. Outside assignments include project planning and development, participation in online peer collaboration activities, and project development through an iterative process

When taught online, these methods may take the form of multimedia and web-based presentations. Assignments will be submitted online as well.

Discipline(s)

Instructional Design/Technology