

LINC 84A: 3-D DESIGN CONCEPTS

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 how 3-D design can be used to replicate, improve, and reduce the costs of producing items.
- Use 3D modeling software to create 3D designs.

Description

Intended for educators and others, this course provides foundational skills for moving 3-D designs from concepts to finished learning projects. The course focuses on application of finished products to meet specific needs or learning outcomes. Troubleshooting and basic maintenance concepts are covered, to allow students to operate and manage 3-D printers.

Course Objectives

The student will be able to:

- Define and identify the types of 3-D design and their uses
- Identify how 3-D design techniques can be used to replicate, improve, and reduce the costs of producing items
- Identify and employ the parts of the design process from 2-D image to 3-D solid using 3-D modeling software
- Design and produce basic items quickly and easily
- Prototype and test items to develop iterative designs
- Identify potential uses for independent 3-D design in education, business, and/or government audiences

Course Content

- Introduction to 3-D design possibilities and uses
 - Reinventing existing objects
 - Combination of design and artistic genres
 - Prototyping new products
 - Additive/ancillary items to existing items
- Design techniques in 3-D printing

- Creating 2-D sketches to visualize items
 - Using online databases as models to improve designs
 - Reverse engineering models to understand design and process
 - Combining design processes from multiple models
- Using 3-D modeling software
 - Developing basic shapes (cube, cylinder, sphere, cone)
 - Combining multiple shapes within one project
 - Understanding scale and its applications within the specific software application
 - Understanding the types of 3-D design software, their features, and uses within industry, business, education, and other applications
- 3-D production process
 - Creating solid objects
 - Creating hollow objects
 - Duplicating objects to ensure scale and interoperability
 - Slicing objects to ensure interoperability
- Design guidelines for successful 3-D printing
 - Material types and uses
 - Build orientation
 - Object thickness considerations (strength/weight)
 - Designing connected parts and custom features/designs)
- Potential applications for 3-D design within society
 - Educational applications
 - Business applications
 - Government applications
 - How does 3-D design reduce costs and time in the product production cycle

Lab Content

Not applicable.

Special Facilities and/or Equipment

- 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.
- 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 software
- 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

- a. Reading assignments include analysis of texts, selected examples, and student projects
- b. Writing assignments include a course project and multiple developmental projects, reflections, discussion responses, and peer feedback on projects
- c. 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