ARCH A170: INTRODUCTION TO DESIGN FABRICATION

Item	Value
Curriculum Committee Approval Date	12/08/2021
Top Code	020100 - Architecture and Architectural Technology
Units	1 Total Units
Hours	36 Total Hours (Lecture Hours 9; Lab Hours 27)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

This is a limited introduction to computer-assisted design fabrication, including simple operations and shop safety. Students will have the opportunity to use laser cutters, CNC routers, robotics, a 3-D printer, etc. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Students will be able to fabricate small work samples using Computer Numerically Controlled router, laser cutter, 3-D printer, and software, safely, and at a beginning level of craft as evaluated by the instructor.

Course Objectives

- 1. Safely work in a shop and operate computerized fabrication equipment.
- 2. Use and maintain hand and powered tools and machinery.
- 3. Demonstrate basic use of computer software for export to fabrication machinery.
- 4. Fabricate small work samples.

Lecture Content

Shop Safety Safety demonstration and test Shop organization, materials storage Intro to tools, equipment Clean-up procedures Intro to Laser Cutting File export Job Set Up Operation Finishing Intro to CNC Router RhinoCAM, models Parts, configuration Tool, materials library Job Set Up Operation, tool paths Techniques: nesting, drill/block, pocketing, facing, engraving Intro to 3-D Printing File export (STL) Job Set Up Operation Finishing

Lab Content

Design and fabricate simple work sample using laser cutter machinery (2-3 weeks) Design and fabricate simple work sample using CNC machinery (2-3 weeks) Design and fabricate simple work sample using 3-D printer (2-3 weeks)

Method(s) of Instruction

- Lecture (02)
- Lab (04)

Instructional Techniques

Lecture and in-class fabrication demonstrations, quizzes, individual and small group activities and instruction

Reading Assignments

Reading of design fabrication manuals: Epilog laser cutter, Flexicam Stealth CNC router, Dimension and MakerBot 3-D printer manuals to support simple work sample specifics, and review of blog posts from designers with written content about their projects

Writing Assignments

Writing for this course includes minor notations and short professional descriptors as evidenced in simple work samples. Critical thinking is reinforced in the act of developing designs for fabrication and presenting them. Visual documentation of contemporary design fabrication techniques will be required to help explore individual student interests.

Out-of-class Assignments

Review of design fabrication projects shared openly on the Internet. Development of visual documentation to explore individual student interests within contemporary design fabrication techniques.

Demonstration of Critical Thinking

Critical thinking is reinforced through instructor-graded assignments, quizzes, and final grading of simple work samples.

Required Writing, Problem Solving, Skills Demonstration

Writing for this course includes minor notations and short professional descriptors, as evidenced in quizzes and the design and fabrication methods employed and presented. Replicating simple design fabrication workflows is a focal point of problem solving. Skills are demonstrated by successful application of individual fabrication techniques per instructor assignments.

Eligible Disciplines

Architecture: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Iwamoto, L.. Digital Fabrications: Architectural and Material Techniques, 1st ed. Princeton Architectural Press, 2009 Rationale: Primary source of information for contemporary design fabrication.

Manuals Resources

1. Epilog Laser. Epilog Mini/Helix Manual, Epilog , 04-22-2010

Other Resources

1. Instructor handouts and reference materials as needed for simple work sample(s) 2. Digital Fabrication Equipment: CNC routers, laser cutters/ engravers, 3-D printers, vacuum formers, robotic systems 3. Cleaning Supplies Equipment: vacuum, broom, dustpan, trash cans