Course Outline

2026-2027 Catalog

MFG 34 - 3D Modeling to Production

Catalog Description

Transfer Status: CSU
Prerequisite: MFG 20, MFG 22, MFG 24, MFG 26
Corequisite: MFG 30, MFG 32, MFG 36
Unit(s): 3.00
Lecture: 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)
Lab: 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)
Total: 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)
Course Description: This course is designed to develop skills around the cycle of advanced manufacturing from 3D modeling to production. Emphasis will be placed on developing basic safety skills, trade math, and the industry terminology, history, and future. These areas of instruction will be reinforced by hands-on application in several performance lab exercises.

Objectives

Upon successful completion of this course, the student should be able to:

1. Practice safety skills that are required on job-sites.
2. Explain the basic principles of 3D modeling used in advanced manufacturing.
3. Describe the principles of manufacturing 3D models.
4. Identify the major reasons that manufacturers use 3D modeling software prior to building a prototype.
5. Convert units of measurement from gauge thickness to decimals, and vice-versa.

Course Content

Topic Titles / Suggested Time Topic

Lecture

Topics	Lec Hrs
Introduction and Safety	2.00
Communication Skills	2.00
Computer Operations	2.00
Designing parts	2.00
Basic assemblies	2.00
Application of Production Software	2.00
Selection of Base Materials	2.00
Equipment Selection and Data Input	5.00
Equipment Selection	2.00
Cost Estimating	2.00
Application of Production	5.00
Equipment Maintenance & Troubleshooting	2.00
Drawings and Work Orders	2.00
Quality Assurance	2.00
Total Hours:	**34.00**

Lab

Topics	Lab Hrs
Introduction and Safety	2.00
Communication Skills	4.00
Intermediate Computer Operations	2.00
File Types and Conversions	4.00
Applications of Manufacturing Modeling Software	4.00
Application of Production Software	5.00
Selection of Base Materials	4.00
Equipment Selection and Data Input	4.00
Equipment Selection	5.00
Cost Estimating	4.00

Topics	Lab Hrs
Application of Production	4.00
Equipment Maintenance & Troubleshooting	3.00
Drawings and Work Orders	3.00
Quality Assurance	3.00
Total Hours:	**51.00**

Methods of Instruction

A. Demonstrations
B. Homework: Students are required to complete one hour of outside-of-class homework for every two hours of activity
C. Laboratory Experiments
D. Lecture
E. Multimedia Presentations

Methods of Evaluation

A. Exams/Tests
B. Quizzes
C. Homework
D. Lab Projects

Examples of Assignments

Reading Assignments

1. Read the selection on the common production software products and be prepared to discuss in class.
2. Read assigned trade journal article and be prepared to discuss in class.

Writing Assignments

1. Write an order of operations for service techniques used as it relates to field inspections of equipment.
2. Write a two-page essay, explaining how the trade journal article can be implemented in workplace safety and how it relates to the class.

Out-of-Class Assignments

1. Research online the proper process for modeling the assigned part within the assigned software program using manufactures publications and be prepared to discuss in class.
2. Research OSHA publications for the use and safety of power tools properly and write a one-page essay

Recommended Materials of Instruction

Schmid, S., & Kalpakjian, S. (2014). Manufacturing Engineering and Technology. *Pearson, 7th.*

Other Learning Materials

All tools listed in the Advanced Manufacturing Program Guide.

Minimum Qualifications

Machine Tool Technology
Manufacturing Technology

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