



Course Outline

2026-2027 Catalog

MFG 44 - Advanced 3D Modeling to Production

Catalog Description

Transfer Status: CSU

Prerequisite: MFG 30, MFG 32, MFG 34, MFG 36

Corequisite: MFG 40, MFG 42, MFG 46

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 further develop skills around the cycle of advanced manufacturing from 3D modeling to production. Emphasis will be placed on developing basic safety skills, multiple layers to equipment, making assemblies of parts, using 2D materials to make 3D parts, and the industry terminology. 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 principles of 3D modeling used in advanced manufacturing.
3. Describe the principles of manufacturing modeling software.
4. Identify the steps used to model a multiple layered assembly used within the advanced manufacturing industry.
5. Convert units of measurement from decimals to fractions and vice-versa.

Course Content

Topic Titles / Suggested Time Topic

Lecture

<u>Topics</u>	<u>Lec Hrs</u>
Introduction and Safety	2.00
Communication Skills	2.00
Computer Operations	2.00
Applications of Manufacturing Modeling Software	2.00
Application of Production Software	2.00
Layers	2.00
Prototypes	2.00
Reverse Engineering	5.00
Research and Development	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

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

Topics	Lab Hrs
Cost Estimating	4.00
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 two hours of outside-of-class homework for each hour of lecture
- 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 prototyping 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

Created/Revised by: Peacock, Miles

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