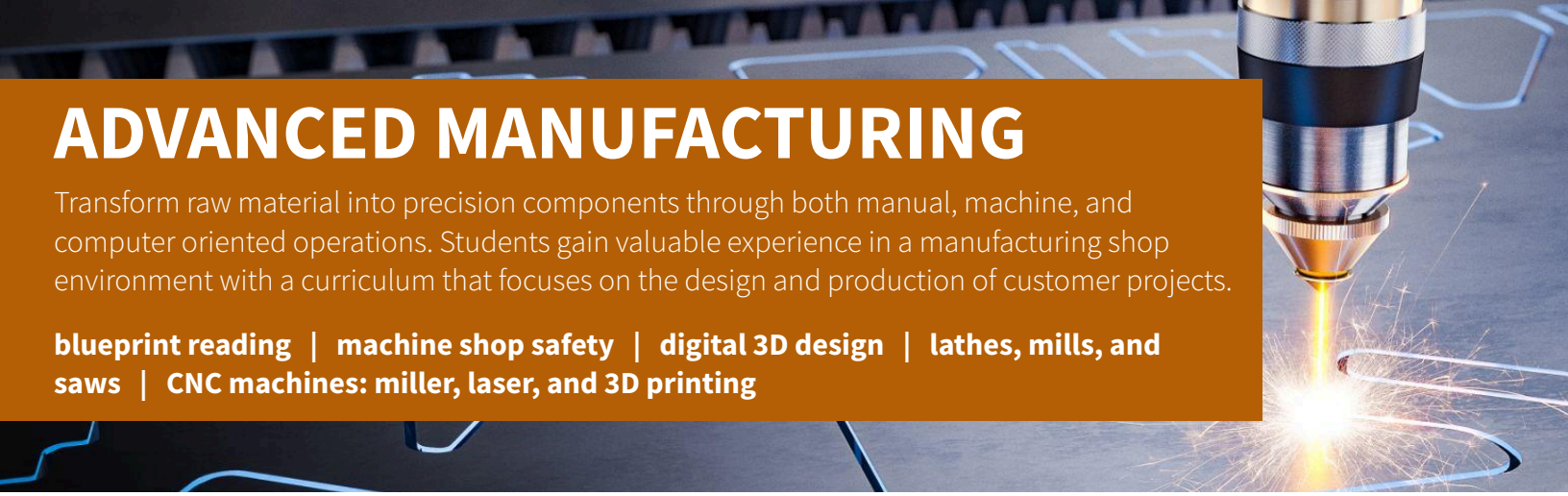

ADVANCED MANUFACTURING

Transform raw material into precision components through both manual, machine, and computer oriented operations. Students gain valuable experience in a manufacturing shop environment with a curriculum that focuses on the design and production of customer projects.

blueprint reading | machine shop safety | digital 3D design | lathes, mills, and saws | CNC machines: miller, laser, and 3D printing

Suggested Abilities

- 8th grade English reading, writing, speaking, and listening
- Understand basic algebra
- Lift 30 pounds
- Sustained activity for 5 hours at a time

Prerequisites

- *High School Students: Meet with counselor for eligibility requirements*

Class Hours

- Morning: 7:50am - 10:40am, Mon. - Fri.
- Afternoon: 12:05pm - 2:55pm, Mon. - Fri.
- Evening: 5:30pm - 10:00pm, Mon. - Thu.

SEMESTER 1

MAC 1001 Introduction to Machine Shop

3 credits

Safety procedures and proper use of bench tools, power saws, drill presses, measurement and hand tools, plus calculating appropriate speeds and feeds for lathes and mills.

MAC 1002 Print Reading for Machinists

3 credits

Read blueprints and interpret symbols, notes, dimensions and tolerances.

MAC 1010 Introduction to Engine Lathe

3 credits

Basic lathe skills: component identification, safety, speed calculation, tool geometry, spindle tooling; operations like facing, drilling, chuck turning, threading; produce parts to ±0.004 tolerance.

MAC 2075 Special Topics: Machine Shop Math

4 credits

Introductory mathematical topics such as measurement, algebra, geometry, trigonometry, graphs, and finance. Emphasis is placed on practical applications of these concepts.

SEMESTER 2

MAC 1011 Intermediate Engine Lathe

3 credits

Prepare single-point external/internal unified screw threads to Class 3 fit; generate angles within 1° using compound rest; ream holes concentric to 0.001 inches; determine cutting speeds; and perform facing and turning operation.

MAC 1020 Introduction to Milling Machine

3 credits

Operate a vertical mill, align a vise, use various tools, determine speeds and feeds, perform indexing, and mill, drill, bore, and tap holes while maintaining a tolerance of ±0.002 inches.

MAC 1021 Intermediate Milling Machine

3 credits

Determine hole locations by coordinates and degrees, use a rotary table, use a jig bore to drill holes by the coordinate method, and work within plus or minus .001 inch tolerance.

MAC 1045 Production Manufacturing

3 credits

Introduction to manufacturing concepts, including Material Identification, Shop Floor Management, Just-In-Time Manufacturing, Kan-Ban Systems, Statistical Quality Control, and Total Quality Management.

SEMESTER 3

MAC 2021 Surface Grinder Setups & Operations

3 credits

Identify major parts and accessories of the surface finder and grind flat, vertical, and angular surfaces to a tolerance of .0002 position and size.

MAC 2040 CAD/CAM 2D

3 credits

Create part geometry, generate and verify tool paths, and post-process NC codes, covering 2-axis and 3-axis machining, lathe programming, and DNC systems through hands-on projects in the CNC manufacturing lab.

MAC 2041 CAD/CAM 2D Lab

3 credits

Lab exercises on robotic machinery: toolpaths for contour, drill, pocket operations, chaining geometry, setting parameters, and managing cutter compensations, primarily emphasizing 2D geometry projects.

MAC 2052 Practical Metallurgy

3 credits

Explores metallurgical terms, focusing on metal behaviors, their industrial applications, and characteristics during heating and shaping. Examine alloys, heat treatment, and their effects on strength, toughness, hardness, and other mechanical properties.

SEMESTER 4

MAC 2001 Intro to CNC Turning Operations

3 credits

CNC lathe operations, control functions, G & M codes, letter address systems, program formats, machine setup, and related math issues. It is not available on an open-entry, open-exit basis.

MAC 2002 CNC Turning Operations II

3 credits

Write CNC lathe part programs, covering G and M codes, setups, various turning techniques, and programming methods. They will also proof and edit programs. This class is not available for open entry or exit.

MAC 2005 Introduction to CNC Milling Operations

3 credits

Conventional machining to CNC machining: learn numerical control systems, Cartesian coordinates, tool motion, feed rates, program structure, conversational programming, and NC machine operations.

MAC 2078 Machining Workshop

3 credits

Provides students with an experiential learning opportunity.

Advanced Manufacturing Certificate

2 Years

49 Credit Hours

PICKENS TECHNICAL COLLEGE

Information Revised DEC '25. Information subject to change. Course listings have been paraphrased on this flyer, or full course info please see Pickens Catalog. This certificate is eligible for Financial Aid. If you have further questions, please call (303)344-4910.