



2011 - 2012  
Career and Technical Programs

Advanced Technology Division  
541.463.5380

lanecc.edu

# Manufacturing Technology

Two-Year Associate of Applied Science Degree

Two-Year Associate of Applied Science Degree Option,  
Computer Numerical Control Technician

Two-Year Certificate of Completion

Statewide Certificate of Completion,  
Basic Manufacturing

**Purpose** To provide training in basic principles and fundamentals in manufacturing (machine shop) and related work. A graduate qualifies for entrance occupations as a machinist in manufacturing shops or related machine tool industries. Employment opportunities include machine repair and maintenance shops, tool and die shops, manufacturing industries, metalworking plants, repair and maintenance shops for mill and construction contractors, high tech and specialty machine shops, and production machine shops.

**Learning Outcomes** The graduate will:

- demonstrate the use of setups and operation of all standard machine tools employed by the modern machine shop.
- demonstrate and use industrial safety standards for safe operation of all machine tools.
- access library, computing, and communications services and obtain information and data from regional and national networks.
- use basic math skills, formulas and right angle trigonometry.

The CNC Option graduate will also:

- set up, program, and operate 3 Axis CNC milling machines with a G-code controller and 2 Axis CNC lathes with a G-code controller.
- design parts with CAM software and apply to CNC machine tools.

**Employment Trends** Statewide, 115 annual openings for machinists are projected in Oregon and 11 openings are projected annually in Lane County.

**Wages** Statewide average, \$19 hourly, \$41,000 annually (\$50,000+ with experience). Lane County average, \$16 hourly, \$37,000 annually.

**Costs in Addition to Tuition and Registration Fees (estimates)\***

Books .....	\$700
Tools .....	\$850-1,075
(import tools may reduce cost by 50%)	
Class Fees.....	\$650
Differential Fees* .....	\$ 1,274
Total	\$3,474-3,699

\* This is the total of all differential fees attached to Manufacturing Technology courses. These and other course fees may change during the year - see the online credit class schedule for fees assigned to courses.

**Prerequisites** Minimum placement score- of 68 in Reading OR completion of RD 080 OR prior college. A high school diploma or equivalent is recommended for all applicants to this program.

**Note** See a counselor or advisor to learn what entry-level skills are suggested for successful completion of this program.

**Admission Information** For consent to enroll in major courses, students must attend a program orientation for fall terms (dates available in Counseling or Enrollment and Student Financial Services) or contact advisor/counselor in winter and spring terms.

**Cooperative Education (Co-op)** Co-op offers students college credit and a grade for on-the-job work experience related to their educational and career goals. Through Co-op, students connect theory and practice, develop skills, expand career knowledge, and make contacts for the future. Work schedules and work sites vary. Under the supervision of the Manufacturing Technology Co-op Coordinator and with instructor consent, a maximum of 18 Co-op credits may be earned in lieu of required Manufacturing Technology course credits. Contact Marv Clemons, Manufacturing Technology Co-op Coordinator, Bldg. 8, Rm. 111, 541.463.3158, [clemonsm@lanecc.edu](mailto:clemonsm@lanecc.edu).

**Two-Year Associate of Applied Science Degree**

First Year	Fall
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
MTH 060 Beginning Algebra <sup>*,D,G</sup> .....	
or higher mathematics.....	4
WLD 151 Fundamentals of Metallurgy <sup>*</sup> .....	3
Total Credits	19

	Winter
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
CS 120 Concepts of Computing: Information Processing or higher computer science course.....	4
PE/Health requirement <sup>D,R</sup> .....	3
Total Credits	19

	Spring
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
WR 115W Introduction to College Writing: Workplace Emphasis <sup>D</sup> or higher writing .....	3
Total Credits	15

# Manufacturing Technology

## Second Year

	Fall
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
DRF 167 CAD 1 <sup>*</sup> .....	4
MTH 076 Applied Geometry for Technicians <sup>*</sup> or higher mathematics.....	4
Total Credits	20

	Winter
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	6
Arts/Letters requirement <sup>R</sup> .....	3
Choice of:.....	6
MFG 201 CNC MILL <sup>*,D,G</sup>	
MFG 202 CNC Lathe <sup>*,D,G</sup>	
Total Credits	15

	Spring
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
WLD 121 Shielded Metal Arc Welding 1 <sup>*</sup> .....	4
Human Relations requirement <sup>R</sup> .....	3
Total Credits	19

## Elective

ENGR 280M Co-op Ed: Manufacturing (optional)

## Manufacturing Technology Computer Numerical Control Technician Option

### Two-Year Associate of Applied Science Degree

#### First Year

	Fall
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
MTH 060 Beginning Algebra <sup>*,D,G,M</sup> or higher mathematics.....	4
WLD 151 Fundamentals of Metallurgy <sup>*</sup> .....	3
Total Credits	19

	Winter
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
Choice of:.....	4
CS 120 Concepts of Computing: Information Processing or higher computer science course	
PE/Health requirement <sup>D,R</sup> .....	3
Total Credits	19

	Spring
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	6
MFG 210 CAM 1 <sup>*,D,G</sup> .....	3
MFG 211 CAM 2 <sup>*,D,G</sup> .....	3
WR 115W Introduction to College Writing: Workplace Emphasis <sup>D</sup> or higher writing.....	3
Total Credits	15

#### Second Year

	Fall
DRF 167 CAD 1 <sup>*</sup> .....	4
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	6
MFG 201 CNC Mill <sup>*,D,G</sup> .....	6
MTH 076 Applied Geometry for Technicians <sup>*</sup> or higher mathematics.....	4
Total Credits	20

## Winter

MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	6
MFG 202 CNC Lathe <sup>*,D,G</sup> .....	6
Choice of:.....	4
DRF 121 Mechanical Drafting <sup>*</sup>	
DRF 168 CAD 2 <sup>*</sup>	
Total Credits	16

## Spring

MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	3
MFG 208 CNC: Special Project <sup>*,D,G</sup> .....	9
Arts/Letters requirement <sup>R</sup> .....	3
Human Relations requirement <sup>R</sup> .....	3
Total Credits	18

## Elective

ENGR 280M Co-op Ed: Manufacturing (optional)

## Manufacturing Technology

### Two-Year Certificate of Completion

#### First Year

	Fall
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
MTH 060 Beginning Algebra or MTH 076 Applied Geometry for Technicians <sup>*,D,G,M</sup> or higher mathematics.....	4
Total Credits	16

## Winter

MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
PE/Health requirement <sup>D</sup> .....	3
Total Credits	15

## Spring

MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
WLD 111 Blueprint Reading for Welders .....	3
Total Credits	15

#### Second Year

	Fall
MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
WLD 121 Shielded Metal Arc Welding 1 .....	4
Total Credits	16

## Winter

MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	6
WR 115W Introduction to College Writing: Workplace Emphasis <sup>D</sup> or higher writing.....	3
Choice of:.....	6
MFG 201 CNC Mill <sup>*,G</sup>	
MFG 202 CNC Lathe <sup>*,G</sup>	
Total Credits	15

## Spring

MFG 197 Manufacturing Technology <sup>*,D,G</sup> .....	12
Human Relations requirement .....	3
Total Credits	15

**Note:** See a counselor or advisor to learn what entry-level skills are suggested for successful completion of this program.

# Manufacturing Technology

## Basic Manufacturing

### Statewide Certificate of Completion

**Purpose** To provide training in basic principles and fundamentals in manufacturing (machine shop) and related work.

**Learning Outcomes** The graduate will be able to:

- demonstrate the use of setups and operation of all standard machine tools employed by the modern machine shop.
- demonstrate and use industrial safety standards for safe operation of all machine tools.
- use basic math skills, formulas and right angle trigonometry.

	Credits
MFG 197 Manufacturing Technology * ,D,G	
Machine Tool Fundamentals .....	3
MTH 060 Beginning Algebra	
or higher mathematics*,D,G.....	4
WLD 111 Blueprint Reading for Welders* .....	3
MFG 197 Manufacturing Technology Inspection *,D,G .....	2
MFG 197 Manufacturing Technology Industrial Safety*,D,G	2
Focus Elective .....	2-4
Total Credits	16-18

### Focus Electives

WLD 121 .....	4
WLD 111 .....	3
MFG 201.....	1-6
MFG 197.....	1-12

Standard footnotes:  
\* Prerequisite required  
B Must be passed with grade of “B” or better to use as a prerequisite

D Degree or certificate requirement; must be passed with grade of “C-” or better  
G Must be taken for a grade, not P/NP; major requirement  
R Required for AAS degree