



Cluster Overview:

Jobs in the manufacturing career cluster involve planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities, such as production planning and control, maintenance, and manufacturing/process engineering.

- Pathway Options:**
- Production
 - Manufacturing & Production Process Development
 - Maintenance, Installation and Repair
 - Quality Assurance
 - Logistics and Inventory Control
 - Health, Safety and Environmental Assurance

Occupation Examples:

Assembler, MIG Welder, TIG Welder, Machine Operator, Sheet Metal Worker, Mechanical Engineer, Industrial Engineer, Quality Control Technician, Safety Technician, Safety Engineer, Dispatcher, Production Manager, Purchasing Agent, Logistician

For a complete listing, go to:
<http://online.onetcenter.org/find/career?c=4&g=Go>

SUGGESTED HIGH SCHOOL COURSES

Based on State Graduation Requirements and Montana College Admissions Criteria: <http://mus.edu/admissions.asp>
 For more information, talk to your school counselor

<i>9th</i>	Graduation Requirements 2-Year College Prep	English, Math, Earth Science (lab science), Health Enhancement	<p>Cluster Foundation Courses: Information Technology Safety in the Workplace</p> <p>Pathway Courses: Metals I, II Welding I, II</p> <p>Student Organization(s): SkillsUSA</p>
	4-Year MT College/Univ Prep (Rigorous Core)	English, Algebra I, Earth (lab) Science, Health Enhancement and 3 years of the following: World Language/Computer Science/Visual or Performing Arts/Career & Tech Ed	
	<i>Career-Related Electives</i>	<i>Cluster Foundation Courses</i>	
<i>10th</i>	Graduation Requirements 2-Year College Prep	English, Math, Biology (lab science), Global Studies	
	4-Year MT College/Univ Prep (Rigorous Core)	English, Geometry, Biology, Global Studies, and 3 years of the following: World Language/Computer Science/Visual or Performing Arts/Career & Tech Ed	
	<i>Career-Related Electives</i>	<i>Cluster/Pathway Courses</i>	
<i>11th</i>	Graduation Requirements 2-Year College Prep	English, U.S. History, Visual/Performing Arts	
	4-Year MT College/Univ Prep (Rigorous Core)	English, U.S. History, Algebra II, Chemistry or Physics and 3 years of the following: World Language/Computer Science/Visual or Performing Arts/Career & Tech Ed	
	<i>Career-Related Electives</i>	<i>Pathway Courses</i>	
<i>12th</i>	Graduation Requirements 2-Year College Prep	English, Government	
	4-Year MT College/Univ Prep (Rigorous Core)	English, Government, Social Studies, College Prep Writing, (additional math encouraged), and 3 years of the following: World Language/Computer Science/ Visual or Performing Arts/Career & Tech Ed	
	<i>Career-Related Electives</i>	<i>Pathway Courses</i>	

ADVANCED LEARNING OPPORTUNITIES

High School to College/Career Linkages

- Tech Prep courses:
- Advanced Placement courses:
- Running Start opportunities:
- Work-based Learning:
- On-line Learning:

MONTANA POSTSECONDARY OPPORTUNITIES

*Montana University System Degree and Program Inventory: <http://www.homepage.montana.edu/~mus/drginv/>
Your Guide to Montana's Certificate and Associate Degree Programs <http://mus.edu/twoyear/YourGuide.html>*

Colleges of Technology: BLCOT—Billings; GFCOT—Great Falls; HCOT—Helena; TECHCOT—Butte; UMCOT—Missoula	Community Colleges: DCC—Glendive; FVCC—Kalispell; MCC—Miles City	Tribal Colleges: BFCC—Browning; CDKC— Lame Deer; FBCC—Harlem; FPCC—Poplar; LBHC—Crow Agency; SCC—Box Elder; SKC— Pablo	Four Year Colleges/Universities: MSU— Bozeman; MSUB—Billings; MSUN—Havre; TECH—Butte; UM—Missoula; UMW—Dillon
MILITARY	<ul style="list-style-type: none"> Requires diploma or GED 17 with parental consent; 18 without 	Air Force, Air Guard, Army, Coast Guard, Marines, Navy For more information: http://todaysmilitary.com	
PROFESSIONAL CERTIFICATE	<ul style="list-style-type: none"> Requires diploma or GED Less than 30 credits; little/no general education credits Complete in one year or less 	Computerized Machine Tool Technology—UMW Electrical Technology—FVCC Welding Technology--TEHCOT, DCOT, FVCC	
APPRENTICESHIP	<ul style="list-style-type: none"> Requires diploma or GED Must be at least 18 Minimum 2,000 hours of supervised experience 	Electricians Sheet Metal Workers See the MT Dept of Labor website for more information: http://wsd.dli.mt.gov/apprenticeship/default.asp	
CERTIFICATE OF APPLIED SCIENCE	<ul style="list-style-type: none"> Requires diploma or GED 30-45 credits; limited general education credits Complete in one year or less 	Electrical Technology—FVCC Heating, Ventilation, Air Conditioning—FVCC Machine Tool Technology—HCOT Welding Technology—HCOT, MCOT, GFCOT, BLCOT, MSUN	
ASSOCIATE'S OF APPLIED SCIENCE DEGREE	<ul style="list-style-type: none"> Requires diploma or GED 60-72 credits; includes 15-25 general education credits Complete in two years (<i>if prepared academically in math and English</i>) 	Electrical Technology—MSUN, FVCC Energy Technology—MCOT Heating, Ventilation, Air Conditioning Tech--BLCOT Metals Technology—HCOT, TECHCOT Power Plant Technology—BLCOT, MCC Process Plant Technology—BLCOT Water Quality Technology—UMN Welding Technology—HCOT, MCOT	
BACCALAUREATE DEGREE	<ul style="list-style-type: none"> Requires 4-year college prep for admission 128 credits (approximately) Complete in four years 	Civil Engineering—TECH, MSU Industrial Engineering—MSU Mechanical Engineering—TECH, MSU Mining Engineering—TECH Occupational Safety & Health—TECH Welding Engineering—TECH	