



# PROGRAM OF STUDY

Career Cluster: Manufacturing

Career Cluster Pathway: Production



This Career Pathway Program of Study can serve as a guide along with other career planning materials as learners continue on a career path. Courses listed within this program are only recommended coursework and should be individualized to meet each learner's education and career goals. **Note:** Many items have links to external resources with more information.

| REQUIRED CREDITS                  | GRADE   | English/<br>Language Arts<br>(4.0 credits)  | Social Studies<br>(2.5 credits)  | Math<br>(2.0 credits)*  | Science<br>(2.0 credits)  | Fine Arts<br>(1.0 credits)                                      | Health/<br>Fitness<br>(2.5 credits)**  | Electives<br>(6.5 credits)   | Related Career & Technical/<br>Occupational<br>(1.0 credits)<br><br>Certificate and Tech Prep<br>(notation on HS and TP alignment)   | SAMPLE<br>Occupations Relating<br>To This Pathway<br><br>(*indicates job in high demand)<br>(☉ indicates a "green" job)  |   |
|-----------------------------------|---|---|--|---|---|---|--|--|--|--|---|
| SECONDARY SAMPLE COURSE OFFERINGS | 9   | English 1<br>or<br>Honors English 1         | Pacific Northwest History (.5)   | Algebra I<br><br>Geometry   | Integrated Science<br>or<br>Adv Int Science   | Credits from Art Courses<br><br><u>or</u><br><br>CTE Equivalent | Health (.5)  | Elective courses (6.5)<br><br><b>and</b><br><br>Project Me<br><br><b>and</b><br><br>Other CAA requirements | <u><b>ASD CTE COURSE OPTIONS</b></u><br><br>Digital Communications/<br>Digitools<br>Industrial Engineering<br>Advanced Industrial Engineering<br>Natural Resource I<br>Natural Resource II<br>Wood Technology I<br>Wood Technology II<br>Sign Making<br>Biotechnology<br>Work Based Learning<br>CTE Grad Project<br><br><u><b>LEADERSHIP</b></u><br><br>SkillsUSA<br><br><u><b>TECH PREP ARTICULATIONS</b></u><br><br>Digital Communications/Digitools – Grays Harbor College<br><br>Natural Resources I – Grays Harbor College (5cr.)<br>(<br>Wood Technology II – Grays Harbor College (5cr.)<br><br><u><b>CERTIFICATIONS</b></u><br><br>Work Readiness Credential<br><br>Refrigeration Handlers Certification | <u><b>Little or No Preparation</b></u><br><ul style="list-style-type: none"> <li>• Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders</li> <li>• Cutters and Trimmers, Hand</li> <li>• Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic</li> <li>• Grinding and Polishing Workers, Hand</li> <li>• Helpers--Production Workers</li> <li>• Machine Feeders and Offbearers</li> <li>• Pressers, Textile, Garment, and Related Materials</li> <li>• Sewers, Hand</li> <li>• Sewing Machine Operators</li> <li>• Tire Builders</li> </ul> <u><b>Some Preparation</b></u><br>☉ Automotive Plant Assembly<br><ul style="list-style-type: none"> <li>• Boat Builder</li> <li>• Boilermakers</li> <li>• Cementing and Gluing Machine Operators and Tenders</li> <li>• Chemical Equipment Operators and Tenders</li> <li>• Chemical Plant and System Operators</li> <li>• Coil Winders, Tapers, and Finishers Coating, Painting, and Spraying Machine Setters, Operators, and Tenders</li> <li>• Computer-Controlled Machine Tool Operators, Metal and Plastic*</li> <li>• Conveyor Operators and Tenders</li> </ul> |   |
|                                   | 10  | English 2<br>or<br>Honors English 2         | US History   | *Class of 2013 (add't 1.0 credit)<br><br><u>or</u><br><br>Algebra II<br><br><u>or</u> | Biology <u>or</u> AP<br>Biology <u>or</u><br>Biotechnology<br><u>or</u> Horticulture<br><u>or</u> Natural Resources I |   | Credits from Health and Fitness Courses  |  |  |  | **Successfully completing two years of physical education and one semester of health is required for high school graduation.                      |
|                                   | 11  | English Electives<br>or<br>Business English | World History<br><u>or</u> Economics<br><u>or</u> Economics II                   | Pre-Calculus<br><br><u>or</u><br><br>Calculus<br><br><u>or</u><br><br>CTE Equivalent  | Science Electives   |   |  |  |  |  |   |
|                                   | 12  | English Electives<br>or<br>Business English | World History<br><u>or</u> Economics<br><u>or</u> Economics II<br><b>and</b> CWP | (Students must pass a math competency test or have four years of math credits.)       |   |   |  |  |  |  |   |
| Y<br>ED<br>UC                     | <b>Technical Certification</b><br><i>(instruction provided through certified training and/or testing centers)</i> |   |  | <b>Apprenticeship Opportunities</b>   |   |   | <b>2-yr or ATA Degree</b><br><i>(Find specific colleges at <a href="http://www.checkoutcollege.com">www.checkoutcollege.com</a>)</i> |  | <b>4 –yr Degree or Advanced Training</b>   |  | <b>Some Prep (cont.)</b><br><ul style="list-style-type: none"> <li>• Crushing, Grinding, and Polishing Machine Setters, Operators, and</li> </ul> |

Various branches of the military offer training opportunities. Visit **Helmets to Hardhats** to learn more about transition programs.

#### **Cabinetmaking and Millwork/Millwright**

- Bates Technical College

#### **Carpentry**

- Bates Technical College
- Grays Harbor College
- Green River Community College
- Peninsula College
- Spokane Community College
- Walla Walla Community College
- Wenatchee Valley College

#### **Chemical Technology**

- Edmonds Community College

#### **Communications Systems Installation and Repair Technology**

- Bates Technical College

#### **Construction/Building Tech./Technician**

- Edmonds Community College
- Lower Columbia College

#### **Construction Trades**

- Renton Technical College
- Skagit Valley College
- Seattle Vocational Institute
- Bates Technical College
- Northwest Indian College
- Northwest Indian College
- Seattle Vocational Institute

#### **Cranes & Riggers**

- West Coast Training

#### **Electrician**

- Bates Technical College
- Bellingham Technical College
- Big Bend Community College
- Perry Technical Institute
- Spokane Community College

To learn more about Apprenticeship, visit **Labor and Industries** website or the **Washington Building Trades**.

Follow these steps to learn about the specific apprenticeships available in this pathway:

**STEP 1:** Link to **Apprenticeship Registration and Tracking System**

**STEP 2:** Search by using key words below or the SOC code listed

- Assembly Machinist (51-2031)
- Boat Builder (47-2031)
- Bridge Carpenter (47-2031)
- Cellular Manufacturing Mach (51-4041)
- Composite Manufacturing (51-9199)
- Gear Machinist (51-4081)
- Industrial Machinist (51-4041)
- Industrial Welder (51-4121)
- Machinist (51-4041)
- Machinist Metal Fabricator (51-4121)
- Marine Machinist (51-4041)
- Mill & Cabinet Maker (51-7011)
- Millman (51-7011)
- Pipefitter (47-2152)
- Production Mill Cabinet (51-7011)
- Sealant Applicator (51-9199)
- Sheet Metal Worker (Manufacturing Only) (4751-22; 11-4031)

**STEP 3:** Click "View" and scroll down to find contact name and program standards for qualifications and how to apply

#### **Cabinetmaking and Millwork/Millwright**

- Seattle Community College-Central Campus

#### **Carpentry**

- Bates Technical College
- Grays Harbor College
- Green River Community College
- Seattle Community College-Central Campus
- Spokane Community College
- Walla Walla Community College

#### **Communications Systems Installation and Repair Technology**

- Bates Technical College

#### **Electrician**

- Bates Technical College
- Bellingham Technical College
- Big Bend Community College

#### **Heavy/Industrial Equipment Maintenance Technologies**

- Big Bend Community College

#### **Industrial Electronics Technology**

- Bates Technical College
- Renton Technical College
- Seattle Community College-North Campus
- Wenatchee Valley College

#### **Machine Tool Technology/Machinist**

- Bates Technical College
- Bellingham Technical College
- Clark College
- Clover Park Technical College
- Columbia Basin College
- Green River Community College
- Lake Washington Technical College
- Lower Columbia College
- Shoreline Community College
- Spokane Community College
- Walla Walla Community College

#### **Washington 4-yr Private and Public Schools offer a variety of degrees related to Business Management and Administration:**

- Business Administration and Management

#### **Construction/Building Tech./Technician**

- Central Washington University
- Washington State University

#### **CTE Secondary Education Teacher**

- Education Degree in a CTE program area with 2000 hours of related work experience
- Industry Route Certificate requires 6000 hours of work experience in the field and completion of a state approved CTE Preparation Program along with passage of Basic Skills Math and English

Tenders Electrical and Electronic Equipment Assemblers

- Cutting and Slicing Machine Setters, Operators, and Tenders
- Diesel Retrofit Installer
- Diesel Retrofit Manufacturer Plant Labor
- Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic
- Extruding, Forming, Pressing, and Compacting Machine Setters, Operators
- Forging Machine Setters, Operators, and Tenders, Metal and Plastic
- Foundry Mold and Coremakers
- Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders
- Furniture Finishers
- Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators,
- Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic
- Hoist and Winch Operators
- Industrial Truck and Tractor Operators
- Inspectors, Testers, Sorters, Samplers, and Weighers
- Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
- Lay-Out Workers, Metal and Plastic
- Metal-Refining Furnace Operators and Tenders
- Mixing and Blending Machine Setters, Operators, and Tenders
- Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic
- Packaging and Filling Machine Operators and Tenders
- Paper Goods Machine Setters, Operators, and Tenders
- Photographic Process Workers

**Heavy/Industrial Equipment Maintenance Technologies**

- Big Bend Community College
- Skagit Valley College
- Lake Washington Technical College

**Industrial Electronics Technology**

- Bates Technical College
- Renton Technical College
- Seattle Community College-North Campus

**Machine Shop Technology**

- Bellingham Technical College

**Machine Tool Technology/ Machinist**

- Bates Technical College
- Bellingham Technical College
- Green River Community College
- Lower Columbia College
- Perry Technical Institute
- Renton Technical College
- Shoreline Community College
- Spokane Community College

**Sheet Metal Technology**

- Bates Technical College

**Upholstery**

- Bates Technical College
- Clover Park Technical College

**Vehicle and Equipment Operators**

- Bates Technical College
- Spokane Community College
- Western Pacific Truck School/Everett
- West Coast Training

**WASHINGTON BUILDING TRADES**

**Carpenters**  
[www.carpenterspnwrc.org](http://www.carpenterspnwrc.org)

**Electricians**  
[www.psejadc.org](http://www.psejadc.org)  
[www.jatc112.org](http://www.jatc112.org)  
[www.nwejatc.org](http://www.nwejatc.org)

**Iron Workers**  
[www.local86.org](http://www.local86.org)  
[www.ironworkers.org](http://www.ironworkers.org)

**Marine Electrical**  
[www.ibew46.org](http://www.ibew46.org)

**Operating Engineers**  
[www.oetraining.com](http://www.oetraining.com)

**Painters, Tapers, Drywall Finishers, Glazers, Floor coverers**  
[www.apprenticeship.net](http://www.apprenticeship.net)

**Plumbers and Pipe fitters**  
[www.seattlepipetrades.org](http://www.seattlepipetrades.org)

**Sheet Metal**  
[www.smtt.org](http://www.smtt.org)  
[www.wwsmjatc.org](http://www.wwsmjatc.org)

**Welding**

- South Puget Sound CC and various others

**Vehicle and Equipment Operators**

- Spokane Community College

**Some Prep (cont.)**

- Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic Pourers and Casters, Metal
- Rolling Machine Setters, Operators, and Tenders, Metal and Plastic

**Some Prep (cont.)**

- Sawing Machine Setters, Operators, and Tenders, Wood
- Semiconductor Processors
- Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters
- Sheet Metal Workers
- Tailors, Dressmakers, and Custom Sewers
- Team Assemblers
- Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders
- Woodworking Machine Setters, Operators, and Tenders, Except Sawing

**Medium Preparation**

- Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and
- Electromechanical Equipment Assemblers
- Engine and Other Machine Assemblers
- Etchers and Engravers
- Fabric and Apparel Patternmakers
- First-Line Supervisors/Managers of Production and Operating Workers
- Machinists
- Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic
- Millwrights
- Model Makers, Metal and Plastic
- Patternmakers, Metal and Plastic
- Petroleum Pump System Operators, Refinery Operators, and Gaugers

POST SECONDARY EDUCATION  
OPTIONS\*

|  |  |  |  |
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**Medium Prep (cont.)**

- Stationary Engineers and Boiler Operators
- Structural Metal Fabricators and Fitters
- Textile Cutting Machine Setters, Operators, and Tenders Textile Knitting and Weaving Machine Setters, Operators, and Tenders
- Textile Winding, Twisting, and Drawing Out Machine Setters, Operators
- Tool and Die Makers
- Upholsterers

**Considerable Preparation**

- CTE Teacher
- Industrial Production Managers

\*Data acquired from [www.workforceexplorer.com](http://www.workforceexplorer.com), [www.sbctc.edu](http://www.sbctc.edu), [www.careerclusters.org](http://www.careerclusters.org), and [www.edf.org/cagreenjobs](http://www.edf.org/cagreenjobs),  
Adapted from <http://www.nthurston.k12.wa.us/education/components/scrapbook/default.php?sectiondetailid=34988>

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