



**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.**



<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Sample Career Specialities / Occupations</b></p>	<ul style="list-style-type: none"> <li>Assemblers</li> <li>Automated Manufacturing Technicians</li> <li>❖ Bookbinders</li> <li>Calibration Technicians</li> <li>Electrical Installers and Repairers</li> <li>Electromechanical Equipment Assemblers</li> <li>Extruding and Drawing Machine Setters/Set-Up Operators</li> <li>Extrusion Machine Operators</li> <li>Foundry Workers</li> <li>Grinding, Lapping, and Buffing Machine Operators</li> <li>❖ Hand Packers and Packagers</li> <li>Hoist and Winch Operators</li> <li>Instrument Makers</li> <li>Large Printing Press Machine Setters and Set-Up Operators</li> <li>Machine Operators</li> <li>Managers, Supervisors</li> <li>Medical Appliance Makers</li> <li>Milling Machine Setters, Set-Up Operators</li> <li>Millwrights</li> <li>Operators, Tenders, Cutters/ Brazers, Soldering, Machine Operations</li> <li>❖ Painters</li> <li>Pattern &amp; Model Makers</li> <li>Precision Layout Workers</li> <li>Precision Optical Goods Workers</li> <li>Production Associates</li> <li>❖ Sheet Metal Workers</li> <li>❖ Solderers and Brazers</li> <li>❖ Tool and Die Makers</li> <li>❑ Welders</li> </ul>	<ul style="list-style-type: none"> <li>+ Design Engineers</li> <li>Electrical and Electronic Technicians and Technologists</li> <li>+ Electronics Engineers</li> <li>Engineering and Related Technicians and Technologists</li> <li>❑ Engineering Technicians</li> <li>+ Industrial Engineers</li> <li>Labor Relations Managers</li> <li>Manufacturing Engineers</li> <li>Manufacturing Technicians</li> <li>Power Generating and Reactor Plant Operators</li> <li>Precision Inspectors, Testers, and Graders</li> <li>Process Improvement Technicians</li> <li>Production Managers</li> <li>❑ Purchasing Agents</li> <li>Supervisors</li> </ul>	<ul style="list-style-type: none"> <li>Biomedical Equipment Technicians</li> <li>❖ Boilermakers</li> <li>Communication System Installers/Repairers</li> <li>Computer Installers/Repairers</li> <li>❑ Computer Maintenance Technicians</li> <li>Electrical Equipment Installers/Repairers</li> <li>Facility Electricians</li> <li>❖ Industrial Electronic Installers/Repairers</li> <li>Industrial Facilities Managers</li> <li>❑ Industrial Machinery Mechanics</li> <li>Industrial Maintenance Electricians</li> <li>Industrial Maintenance Mechanics</li> <li>Industrial Maintenance Technicians</li> <li>Instrument Calibration and Repairers</li> <li>Instrument Control Technicians</li> <li>Job/Fixture Designers</li> <li>Laser Systems Technicians</li> <li>❑ Maintenance Repairers</li> <li>Major Appliance Repairers</li> <li>Meter Installers/Repairers</li> <li>❑ Millwrights</li> <li>❑ Plumbers, Pipe Fitters and Steam Fitters</li> <li>❑ Security System Installers/Repairers</li> </ul>	<ul style="list-style-type: none"> <li>+ Calibration Technicians</li> <li>❑ Inspectors</li> <li>Lab Technicians</li> <li>Process Control Technicians</li> <li>Quality Control Technicians</li> <li>Quality Engineers</li> <li>SPC Coordinators</li> </ul>	<ul style="list-style-type: none"> <li>Communications, Transportation and Utilities Managers</li> <li>❑ Dispatchers</li> <li>❖ Freight, Stock, and Material Movers</li> <li>Industrial Truck and Tractor Operators</li> <li>+ Logistical Engineers</li> <li>Logisticians</li> <li>Material Associates</li> <li>Material Handlers</li> <li>Material Movers</li> <li>Process Improvement Technicians</li> <li>Quality Control Technicians</li> <li>❖ Traffic Managers</li> <li>❖ Traffic, Shipping, and Receiving Clerks</li> </ul>	<ul style="list-style-type: none"> <li>+ Environmental Engineers</li> <li>Environmental Specialists</li> <li>Health and Safety Representatives</li> <li>Safety Coordinators</li> <li>+ Safety Engineers</li> <li>Safety Team Leaders</li> <li>Safety Technicians</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Pathways</b></p>	<p style="text-align: center;"><b>Production</b></p>	<p style="text-align: center;"><b>Manufacturing Production Process Development</b></p>	<p style="text-align: center;"><b>Maintenance, Installation &amp; Repair</b></p>	<p style="text-align: center;"><b>Quality Assurance</b></p>	<p style="text-align: center;"><b>Logistics &amp; Inventory Control</b></p>	<p style="text-align: center;"><b>Health, Safety and Environmental Assurance</b></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);"><b>Cluster K&amp;S</b></p>	<p><b>Cluster Knowledge and Skills</b></p> <ul style="list-style-type: none"> <li>• Academic Foundations</li> <li>• Communications</li> <li>• Employability and Career Development</li> <li>• Ethics and Legal Responsibilities</li> <li>• Information Technology</li> <li>• Leadership and Teamwork</li> <li>• Problem Solving and Critical Thinking</li> <li>• Safety, Health, and Environment</li> <li>• Systems</li> <li>• Technical Skills</li> </ul>			<p><b>Education Needed for Career</b></p> <ul style="list-style-type: none"> <li>❖ High School – completed high school, high school with career and technology training, GED, on-the-job training, or apprenticeship</li> <li>❑ Junior College – completed junior/community college, postsecondary technical, or career and technology training</li> <li>+ Baccalaureate Degree – completed four-year degree or more</li> </ul>		