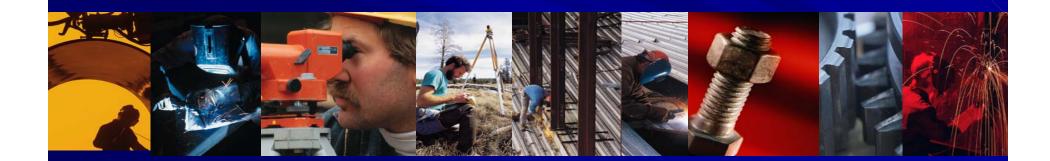
## Career Clusters & Pathways



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- Prepares learners for careers in planning, managing, and performing the processing of materials into intermediate or final products.
- Careers include related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.
- Employment is expected to increase slightly as strong demand continues for high-tech electrical goods and pharmaceuticals.

## **Necessary Skills and Traits**

- Solid background in math, science and technical skills
- Knowledgeable in their subject
- Industry also plays a major role in training/career development by supporting apprenticeships, training, joint industry/school programs and industry training leading to certification and college

credit.







#### Production Manufacturing Production Process Development Maintenance, Installation & Repair



#### **Production**



#### Career Cluster Area: Manufacturing Career Pathway: Production Pathway Major Courses

3 + 1

To complete a pathway, one must take THREE Pathway Required Concentration Courses and ONE additional Pathway Elective Course.

- Pathway Concentration Courses (3)
  - Arc Welding I
  - Electrical Systems I\*
  - Introduction to Manufacturing/Engineering Sciences
  - Introduction to Precision Machining

#### Pathway Elective Courses (1)

- Apprenticeship/Internship
- Electrical I\*
- Foundations of Engineering and Technology
- Introduction to Construction\*
- Occupational Safety & Fundamentals
- Other Pathway Concentration Course

### Other Recommended Electives **Production**

Algebra I
Informal Geometry
Modern Language
Physical Science
Pre-Algebra

## Post-Secondary Degrees, Diplomas & Certificates Production

Technical Colleges

- Electrical Control
  - Systems
- Industrial Mechanical Technology
- Industrial Motor
   Control
- Machine Tool
   Technology
- Welding & Joining Technology

- Colleges/Universities
  - Applied Science in Technology
  - Design Engineering
  - Electrical Engineering
  - Industrial Engineering
  - Mechanical Engineering

## Careers in Production

- Assembler
- Instrument Maker
- Manager, Supervisor
- Production Associate
- Sheet Metal Worker
- Electrical Installer
- Machinist
- Bookbinder
- Machine Operator
- Millwright
- Painter
- Welder
- Repairer
- CNC Technician

- Calibration Technician
- Hand Packer and Packager
- Medical Appliance Maker
- Pattern & Model Maker
- Solderer and Brazer
- Equipment Assembler
- CNC Programmer
- Electrical Installer and Repairer
- Hoist and Winch Operator
- Precision Optical Goods Worker
- Tool and Die Maker
- Automated Manufacturing Tech
- CNC Operator



## Employment Outlook Production

Individuals with a broad range of skills or a specific skill that cannot be automated will experience job growth and find their services in demand.

Welders, tool and die makers, and multiple machine operators are examples of these growth occupations.

#### Manufacturing Production Process Development



#### Career Cluster Area: Manufacturing Career Pathway: Manufacturing Production Process Development Pathway Major Courses 3 + 1

To complete a pathway, one must take THREE Pathway Required Concentration Courses and ONE additional Pathway Elective Course.

- Pathway Concentration Courses (3)
  - Integrating Systems
  - Intro to Manufacturing/Engineering Science
  - Mechanical/Electrical Systems I
- Pathway Elective Courses (1)
  - Apprenticeship/Internship
  - Drafting Technology: Introduction
  - Foundations of Engineering and Technology

Other Recommended Electives Manufacturing Production Process Development

Algebra I
Informal Geometry
Introduction to Engineering Drawing
Peer Leadership
Pre Algebra
Pre-Engineering Technology

Post-Secondary Degrees, Diplomas & Certificates Manufacturing Production Process Development

Technical Colleges

- Electrical Control
  - Systems
- Industrial Mechanical
  - Tech
- Industrial Motor
  - Control

Colleges/Universities

- Electrical Engineering
- Industrial Engineering

Careers in Manufacturing **Production Process Development** Design Engineer Purchasing Agent Electrical Technician Electronics Engineer Power Generating and Manufacturing Engineer **Reactor Plant Operator** Production Manager Industrial Engineer Supervisor Precision Inspector, Labor Relations **Tester and Grader** Process Improvement Manager Engineering **Technician** Electronic Technician Technician Manufacturing and Technologist Technician



Employment Outlook Manufacturing Production Process Development

Employment in some of the occupations in this pathway are predicted to grow more slowly than the average because of increasing automation in the manufacturing sector.
 Electrical engineering positions will grow about as fast as the average.

## Maintenance, Installation & Repair



#### Career Cluster Area: Manufacturing Career Pathway: Maintenance, Installation & Repair Pathway Major Courses 3 + 1

To complete a pathway, one must take THREE Pathway Required Concentration Courses and ONE additional Pathway Elective Course.

#### Pathway Concentration Courses (3)

- Arc Welding I
- Electrical Systems I
- Intro to Manufacturing/Engineering Sciences
- Introduction to Precision Machining

#### Pathway Elective Courses (1)

- Apprenticeship/Internship
- Drafting Technology: Introduction
- Engineering Concepts
- Other Pathway Concentration Course

Other Recommended Electives Maintenance, Installation & Repair

Algebra I
Informal Geometry
Integrating Systems
Physical Science
Pre-Algebra

## Post-Secondary Degrees, Diplomas & Certificates Maintenance, Installation & Repair

- Technical Colleges
  - Electrical Control
     Systems
  - Industrial Mechanical
     Technician
  - Industrial Motor
    - Control
  - Machine Tool Tech
  - Welding & Joining
     Tech

Colleges/Universities

- Applied Science in Technology
- Design Engineering
- Electrical Engineering
- Industrial Engineering
- Mechanical
  - Engineering

# Careers in Maintenance, Installation & Repair

- Computer Installer/Repairer
- Facility Electrician
- Instrument Control Technician
- Job/Fixture Designer
- Laser Systems Technician
- Maintenance Repairer
- CNC Programmer
- Computer Maintenance Technician
- Industrial Facilities Manager
- Industrial Maintenance Electrician
- Industrial Maintenance Mechanic
- Instrument Calibration and Repairer

Security System Installer/Repairer

- CNC Specialist/CNC Operator
- Electrical Equipment Installer/Repairer
- Industrial Machinery Mechanic
- Industrial Electronic Installer/Repairer
- Industrial Maintenance Technician
- Plumber, Pipe Fitter and Steam Fitter
- Biomedical Equipment Technician
- Machinist/Welder



## Employment Outlook Maintenance, Installation & Repair

In this pathway, Maintenance Technicians and Repair positions will experience average growth for jobs across all sectors.

In addition, job opportunities will be plentiful because of a shortage of qualified applicants. This will, in part, be due to the increasing complexity of equipment.

The best job prospects will be for those with broad skill sets.

#### Production Manufacturing Production Process Development Maintenance, Installation & Repair







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