



# Apprenticeships in ADVANCED MANUFACTURING

The City Colleges of Chicago Apprenticeship Program in Advanced Manufacturing builds the skills that manufacturing companies need, teaching students modern methods of organizing production and lean manufacturing. We provide hands-on training in state-of-the-art facilities and partner with nationally recognized industry organizations to develop relevant curriculum in Factory Automation. Our Advanced Manufacturing apprenticeship program integrates with manufacturing positions at your organization.

The following certificates and degrees, when combined with an apprenticeship from a manufacturing partner, give students a well-rounded education that best prepares them to enter your organization.

## *Employer Position:*

### Machine Maintenance Technician

**Job description:** Ensures that industrial machinery and equipment run smoothly and reliably, reassembling machines after repair, changing parts as needed and performing preventative maintenance tasks.

#### Responsibilities & Requirements

- Observe machine operations for efficiency
- Install parts according to production specifications
- Read work orders and inspect damaged machine parts
- Troubleshoot equipment problems
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#### Knowledge & Skills Required

- Machine operation and Maintenance
- Read technical plans, blueprints, and manuals
- Complex problem solving

## *Related Technical Instruction at City Colleges:*

### Factory Automation

**Degrees offered:** Basic Certificate (BC),  
Advanced Certificate (AC)

The Basic Certificate teaches foundational mechanical and electrical skills to students pursuing a career in maintenance or equipment service. The advanced certificate provides training in programmable logic controls, motors and controls, and equipment integration.

#### Critical Coursework

- Welding
- Pneumatics
- Industrial Hydraulics
- Programmable Logic Controls
- Computer-Integrated Manufacturing

### Manufacturing Technology

**Degree offered:** Associate in Applied Science (AAS)

The Associate in Applied Science degree program in Manufacturing Technology covers theory, practical projects, and technology skills required for maintenance mechanics in the manufacturing or service industries.

#### Critical Coursework

- Quality Assurance
- Computer-Aided Drafting
- Principles of Mechanisms
- Machining Processes I, II
- Manufacturing Materials & Processes



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## *Employer Position:*

### **CNC Machine Operator**

**Job description:** Analyzes blueprints to calculate tool selection and machine speeds to ensure machinery functions properly and produces items to specification.

#### **Responsibilities & Requirements**

- Determine the sequence of machine operations and select the proper cutting tools
- Revise and retest programs to ensure accuracy
- Observe machines on trial runs and conduct simulations
- Write programs in the language of a machine's controller
- Modify existing programs to enhance efficiency

#### **Knowledge & Skills Required**

- Machine operation and gauge use
- Production procedures and lean concepts
- Read blueprints, schematics and manuals

### **Tool and Die Machinist**

**Job description:** Uses blueprints or specifications to plan sequences of operations for fabricating tools, dies, or assemblies.

#### **Responsibilities & Requirements**

- Calculate dimensions of work pieces, products, or equipment
- Operate CNC machine tools and control machine processes
- Inspect finished products for conformity

#### **Knowledge & Skills Required**

- Machine monitoring and control
- Engineering science and technology
- Quality control analysis

## *Related Technical Instruction at City Colleges:*

### **CNC Machining**

**Degrees offered:** Basic Certificate (BC),  
Advanced Certificate (AC)

The Advanced Certificate program in Computerized Numerical Control teaches the principles of machine tool technology and incorporates basic computer applications relevant to manufacturing, including CNC programming and computer-integrated manufacturing (CAD/CAM).

#### **Critical Coursework**

- Machining Processes I, II
- Manufacturing Materials and Processes
- CNC Operations and Programming
- Computer-Aided Manufacturing