



## Computer Numerically Controlled Machine Operator (CNC NIMS or 180 Skills Certified CNC Lathe Production Technician and CNC Machining Center Production Technician)

Many materials and parts in today's consumer products are produced by numerical control machines. Abbreviated CNC, these machines cut, shape, or otherwise modify metal, plastic or wood parts. Computer programming determines which tools are to be used and how to use them, but machine operators are responsible for setting up, tending, and maintaining CNC machines.

Operators load the CNC machines with instructions or programs. They then determine the speed and feed ratios as well as the size and position of cuts. They select, measure, install, and secure the tools and attachments the machines will use, reading blueprints and using their knowledge of the job to select the proper tools.

While the machines are operating, operators may enter commands or adjust machine controls to correct errors. When the process is completed, they remove the finished products, taking measurements to ensure they meet requirements.

Many modern machines are enclosed, minimizing safety hazards. As needed, operators wear protective equipment, such as safety glasses, to protect them from flying particles of metal or plastic, earplugs to guard against noise from the machines, and steel-toed boots, to shield their feet from heavy objects that are dropped.

Most CNC workers are employed full time during regular business hours. Overtime is common and evening and weekend work is also common.

### Indiana Wage Information

	Entry	Median
Hourly Wage	\$13.22	\$15.53

### Job Outlook in Indiana

Long Term	6.7 % (increase)
Short Term	5.2 % (increase)

\*Data collected from [hoosierdata.in.gov](http://hoosierdata.in.gov)

### Job Duties

- Monitor machines and control panel displays
- Use blueprints, instructions, and work experience to determine how to set up machines
- Load machine controllers with instructions or programs
- Select, measure, install, and secure tools on machine
- Calculate machine speeds and feed ratios; determine the size and position of cuts
- Enter commands or adjust machine controls to correct errors
- Measure finished products to ensure they meet requirements
- Maintain machines and replace machine tools when they become worn or broken

## Important Qualities

**Operation monitoring** - must be able to watch gauges, dials, or other indicators to make sure a machine is working properly

**Reaction time** - must be able to quickly respond to machine signals when they appear

**Visual acuity** - must be able to see details at close range

**Hearing Sensitivity** – must be able to detect or tell the differences between sounds that vary in pitch and loudness and focus on a single source of sound

**Problem sensitivity** - must be able to recognize when something is wrong or likely to go wrong

## Skills and Knowledge

### Technical

- Understand machines and tools, their designs, uses, repair, and maintenance
- Perform customer needs assessments and evaluate customer satisfaction
- Use logic and reasoning to identify solutions to problems
- Conduct tests and inspections of products, services, or processes
- Knowledge of computer hardware and software, including applications and programming can be helpful

### English Language Arts

- Read and understand work-related materials
- Express ideas clearly when speaking or writing

### Math

- Knowledge of arithmetic, algebra, geometry, trigonometry, statistics, and their applications is helpful

## Certification and Advancement

Most employers require a minimum of a high school diploma or equivalent. Work experience as a machinist, machine setter, operator, or tender can be a good background for these positions. A solid math background, including algebra, geometry, trigonometry, and basic statistics, is useful, along with experience working with computers. Minimum age is 18 or older.

CNC operators may train in apprenticeship programs, on the job, and in secondary, vocational or postsecondary schools. The more skills needed for the job, the more education and training are needed to qualify. Some community colleges and other schools offer courses and certificate programs in operating metal and plastics machines.

The National Institute for Metalworking Skills (NIMS) has developed skills standards in 24 operational areas and offers 52 skills certifications. Two common entry-level NIMS certifications are:

- Machining Level 1 – CNC Milling: Programming and Setup & Operations
- Machining Level 1 – CNC Turning: Programming and Setup & Operations

Each certification above requires around 8 – 20 weeks of training and the completion of certification exams in both performance and knowledge. The Fabricators & Manufacturers Association International and the International Society of Automation also offer credentialing in this field. Exams for the 180 Skills Certified CNC Lathe Production Technician and 180 Skills Certified CNC Machining Center Production Technician are delivered by SpaceTec, the National Science Foundation's National Resource Center that promotes and educates candidates for technical training.

Advancement for operators usually takes the form of higher pay. However, there are also opportunities for operators to advance to new positions. For example, they can run multiple machines. They can become trainees for more highly skilled jobs, such as machinists or numerical control tool programmers. Operators who have good people skills may advance to supervisory jobs.

## How can YOU get involved?

The world of work relies on the foundational skills students acquire in your classrooms or programs!

- Know your students'/clients' interests and career goals
- Affirm the value of the skills/hobbies students demonstrate both in and outside of the classroom
- Infuse your classroom culture and/or meetings with career-minded activities
- Provide time to make connections between the material learned in adult education or workshops and students' daily lives/career aspirations
- Know the basic job descriptions and training requirements of in-demand occupations in your area
- Know which WorkINdiana programs are available in your region
- Know the processes for referring students to postsecondary or on-the-job training
- Post resources where students can find more information about further education/training and careers

Sources and Further Information:

[www.bls.gov/ooh/](http://www.bls.gov/ooh/)

[www.iseek.org/index.jsp](http://www.iseek.org/index.jsp)

[www.mynextmove.org](http://www.mynextmove.org)

[www.indianacareexplorer.com](http://www.indianacareexplorer.com)

[www.indianaskills.com](http://www.indianaskills.com)

[www.careeronestop.org](http://www.careeronestop.org)

\*Last Updated July 2016