



# CNC OPERATOR/SETUP & PROGRAMMER

## TARGET OCCUPATION PROFILE

|                                    | Jobs in 2012 | Expected Growth by 2022 | Yearly Openings | Entry Level Wage | Mid-Level Wage | Experienced Wage | Average Yearly Salary |
|------------------------------------|--------------|-------------------------|-----------------|------------------|----------------|------------------|-----------------------|
| <b>CNC Machine Operators/Setup</b> | 2,635        | 14%                     | 50              | \$11             | \$18           | \$28             | \$38,900              |
| <b>CNC Machine Programmers</b>     | 390          | 8%                      | 8               | \$12             | \$18           | \$30             | \$41,100              |

Sources: EMSI 2012, O\*NET, Illinois WorkNet, American Community Survey 2009-2011 for Cook Co. Covers Standard Occupational Codes 51-4011 and 51-4012.

### JOB DUTIES

#### Operator and Setup

- Install tools and attachments on machines; replace dull cutting tools.
- Ensure machines and workpieces (metal and plastic) are properly lubricated and cooled
- Insert instructions into machine control units to start operation; adjust machine feed and speed as necessary.
- Use precision measuring instruments to measure dimensions of finished pieces.

#### Programmer

- Analyze job orders and specifications to determine sequence, dimensions, tools, machine speeds, and feed rates.
- Review blueprints and translate them to computer code with specified commands for the machine to follow. Compare computer printouts with original specifications to verify accuracy.
- This job is a step above CNC Operator on the manufacturing career ladder.

Visit [www.onetonline.com](http://www.onetonline.com) for more information about these occupations.

### IS THIS JOB A GOOD FIT FOR ME?

|                           |  |
|---------------------------|--|
| <b>Education</b>          | New entrants into the field require a high school diploma or GED. Some employers may require a postsecondary degree, but in many cases training is through an apprenticeship program or on the job.  |
| <b>Skills/Aptitude</b>    | Good candidates will have mechanical aptitude, critical thinking skills, and computer knowledge. An 8 <sup>th</sup> grade reading level is often required.   |
| <b>Certifications</b>     | Certification is optional for CNC machine operators and programmers. Some employers may prefer that employees have certification, which can be obtained through trade associations such as the National Institute for Metalworking Skills or the National Associations of Manufacturers. |
| <b>Other Requirements</b> | Workers may need to undergo criminal background checks and drug testing. Those with a record of violent crime or theft may not be eligible for these jobs. Jobs may involve mandatory overtime and shift work.   |

### ARE THERE OPPORTUNITIES FOR ADVANCEMENT?

More than half of current CNC operators and programmers in Cook County are aged 49 or older, so there will likely be job openings in the field due to retirements. CNC operators can gain experience and become a CNC Programmer. Both programmers and operators can move into supervisory roles.

### WHERE CAN I GO TO GET TRAINING?

Visit [www.chicagolandwiatraining.com](http://www.chicagolandwiatraining.com) to search for WIA-certified training providers in Cook County, based on occupation, program cost, location, completion rate, employment, and wages.

### WHO ARE THE LARGEST EMPLOYERS IN THE INDUSTRY?

Machine shops (Continental Field), miscellaneous fabricated metal manufacturing (CB Lynn), special die and tool manufacturing (Metal Impact Corp.), metal stamping (National Lamination)

### WHAT OTHER JOB TITLES SHOULD I LOOK FOR IN HELP WANTED ADS?

CNC machinist/machine operator, CNC set-up technician, process engineer, welding engineer, CAD/CAM programmer

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CHICAGO COOK WORKFORCE PARTNERSHIP

Revised June 2013



## INDUSTRIAL MACHINERY MECHANIC TARGET OCCUPATION PROFILE

### Industrial Machinery Mechanics Maintenance Workers, Machinery

| Jobs in 2012 | Expected Growth by 2022 | Yearly Openings | Entry Level Wage | Mid-Level Wage | Experienced Wage | Average Yearly Salary |
|--------------|-------------------------|-----------------|------------------|----------------|------------------|-----------------------|
| 3,175        | 18%                     | 61              | \$16.13          | \$25.05        | \$34.73          | \$52,125              |
| 1,533        | 2%                      | 28              | \$16.46          | \$25.15        | \$33.10          | \$51,293              |

Sources: EMSI 2012, O\*NET, American Community Survey 2009-2011 for Cook Co. Covers SOC codes 49-9041 and 41-9043.

### JOB DUTIES

#### Inspect

- Examine parts for defects or wear
- Test machinery and diagnose problems
- Read work orders and test results to determine necessary repairs

#### Maintain

- Clean, lubricate, or adjust parts or machinery.

- Maintain the operating condition of manufacturing machinery or equipment.
- Record maintenance information

#### Repair

- Disassemble machinery or equipment to make repairs
- Repair or replace malfunctioning parts.

Visit [www.onetonline.org](http://www.onetonline.org) for more information about this occupation.

### IS THIS JOB A GOOD FIT FOR ME?

|                    |   |
|--------------------|---|
| Education          | Industrial machinery mechanics and maintenance workers tend to require at least a high school diploma or GED, and often employers are seeking a post-secondary certification or degree.         |
| Skills/Aptitude    | Good candidates will have mechanical aptitude, critical thinking skills, and computer knowledge. An 8 <sup>th</sup> grade reading level (or 80% TABE score) is often required.                  |
| Certifications     | Certification is not required; however, voluntary certification is available from organizations such as the International Society of Automation and the Electronics Technicians Association.    |
| Other Requirements | Workers may need to undergo criminal background checks and drug testing. Those with a record of violent crime or theft may not be eligible. Jobs may involve mandatory overtime and shift work. |

### ARE THERE OPPORTUNITIES FOR ADVANCEMENT?

Roughly half of those working in these occupations are aged 49 or older, so there may be openings due to retirements in coming years.

### WHERE CAN I GO TO GET TRAINING?

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### WHO ARE THE LARGEST EMPLOYERS IN THE INDUSTRY?

Iron and steel mills (Tempel Steel, US Steel) Commercial and industrial machinery and equipment repair and maintenance (Coils, Inc, Duroweld), industrial machinery and equipment wholesalers (BP, New York Blower Company)

### WHAT OTHER JOB TITLES SHOULD I LOOK FOR IN HELP WANTED ADS?

Maintenance mechanic, maintenance technician, maintenance electrician, engineering technician, machine adjuster, overhauler, industrial electrician

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## MACHINIST TARGET OCCUPATION PROFILE

### Machine Operators and Machinists, Metal and Plastic

| Jobs in 2012 | Expected Growth by 2022 | Yearly Openings | Entry Level Wage | Mid-Level Wage | Experienced Wage | Average Yearly Salary |
|--------------|-------------------------|-----------------|------------------|----------------|------------------|-----------------------|
| 21,780       | <i>Expected decline</i> | 370             | \$9-\$13         | \$13-\$20      | \$19-29          | \$29,300 - \$41,400   |

*The highest earning types of machine operators are those that work with forging machines and rolling machines. The lowest earning are those who work with punch press machines and molding and casting machines. Sources: EMSI 2012, O\*NET, Illinois workNet, American Community Survey 2009-2011 for Cook Co. Covers SOC codes 51-4021, -4022, -4023, -4032, -4033, -4034, -4035, -4041, -4071, -4072, -4081.*

### JOB DUTIES

- Use precision measuring instruments to calculate dimensions, and operate a variety of machines or tools or create parts or products to specifications.
- Examine completed units for defects
- Maintain machines and tools in proper operating condition
- The duties of machinists vary widely based on the type of machine they are operating.

Visit [www.onetonline.org](http://www.onetonline.org) for more information about different types of machinists.

### IS THIS JOB A GOOD FIT FOR ME?

|                    |   |
|--------------------|---|
| Education          | Machinists tend to require at least a high school diploma or GED, and often employers are seeking a post-secondary certification or degree.   |
| Skills/Aptitude    | Good candidates will have mechanical aptitude, critical thinking skills, and computer knowledge. An 8 <sup>th</sup> grade reading level (or 80% TABE score) is often required.                  |
| Certifications     | Certification for machinists is optional. The National Institute of Metalworking Skills (NIMS) offers one of the more widely recognized machinist credentials. <sup>1</sup>                     |
| Other Requirements | Workers may need to undergo criminal background checks and drug testing. Those with a record of violent crime or theft may not be eligible. Jobs may involve mandatory overtime and shift work. |

### ARE THERE OPPORTUNITIES FOR ADVANCEMENT?

Several types of machinists have large proportions of workers nearing retirement age, including extruding machine, forging machine, and lathe operators.

### WHERE CAN I GO TO GET TRAINING?

Visit [www.chicagolandwiatraining.com](http://www.chicagolandwiatraining.com) to search for WIA-certified training providers in Cook County, based on occupation, program cost, location, completion rate, employment, and wages.

### WHO ARE THE LARGEST EMPLOYERS IN THE INDUSTRY?

Machine shops (Headco), temporary help services, plastics product manufacturing (Trimax Building Products), metal stamping (Triton Industries)

### WHAT OTHER JOB TITLES SHOULD I LOOK FOR IN HELP WANTED ADS?

Die setter, machine technician, set-up person, gear machinist, production machinist

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<sup>1</sup> For more information see [www.nims-skills.org](http://www.nims-skills.org)



## TEAM ASSEMBLER TARGET OCCUPATION PROFILE

### Team Assemblers and Fabricators

| Jobs in 2012 | Expected Growth by 2022 | Yearly Openings | Entry Level Wage | Mid-Level Wage | Experienced Wage | Average Yearly Salary |
|--------------|-------------------------|-----------------|------------------|----------------|------------------|-----------------------|
| 32,319       | 5%                      | 617             | \$9-11           | \$12-17        | \$19-30          | \$27,800 – \$37,500   |

Sources: EMSI 2012, O\*NET, American Community Survey 2009-2011 for Cook Co. Covers SOC codes 51-2021, 51-2022, 51-2023, 51-2031, 51-2041, 51-2092, 51-2099. General team assemblers tend to earn lower wages in this range, while more specialized electromechanical or structural metal assemblers earn higher wages.

### JOB DUTIES

#### General

- Read blueprints and specifications to determine component parts and assembly sequences.
- Rotate through all the tasks required in a production process.
- Perform quality checks and maintain equipment.

#### Electrical, electronic, electromechanical assemblers

- Align parts to facilitate wiring or assembly.
- Use hand tools, rivets, bolts, soldering or welding equipment and precision measuring

instruments to assemble electrical or electronic systems.

#### Structural metal assemblers

- Move parts into position, manually or with hoists or cranes.
- Set up and operate metal fabricating machines, such as brakes, rolls, shears, flame cutters, grinders, and drill presses.

Visit [www.onetonline.org](http://www.onetonline.org) for more information about these occupations.

### IS THIS JOB A GOOD FIT FOR ME?

|                    |   |
|--------------------|---|
| Education          | Requirements vary. The majority of electronic and electromechanical assemblers them have a high school diploma or less. However, structural metal assemblers and fabricators tend to have a post-secondary degree or award. Some employers prefer candidates with manufacturing certifications. |
| Skills/Aptitude    | Good candidates will have mechanical aptitude, critical thinking skills, and computer knowledge. An 8 <sup>th</sup> grade reading level (or 80% TABE score) is often required.  |
| Other Requirements | Workers may need to undergo criminal background checks and drug testing. Those with a record of violent crime or theft may not be eligible. Jobs may involve mandatory overtime and shift work.   |

### ARE THERE OPPORTUNITIES FOR ADVANCEMENT?

Much of the workforce is nearing retirement age, so openings will likely arise in the near future. Team Assemblers can move on to become team leaders, and eventually move on to shift management roles.

### WHERE CAN I GO TO GET TRAINING?

Visit [www.chicagolandwiatraining.com](http://www.chicagolandwiatraining.com) to search for WIA-certified training providers in Cook County, based on occupation, program cost, location, completion rate, employment, and wages.

### WHO ARE THE LARGEST EMPLOYERS IN THE INDUSTRY?

Temporary help services and employment placement agencies, automobile manufacturing (Molon Motor and Oil, Chevrolet, Ford) Switchgear and switchboard apparatus manufacturing (Schneider Electric, S&C Electric), miscellaneous fabricated metal product manufacturing (CB Lynn, Parker Hannifin)

### WHAT OTHER JOB TITLES SHOULD I LOOK FOR IN HELP WANTED ADS?

Assembly line worker, machine operator, operator technician, production associate, factory worker





## TOOL & DIE MAKER

### TARGET OCCUPATION PROFILE

|                            | Jobs in 2012 | Expected Growth by 2022 | Yearly Openings | Entry Level Wage | Mid-Level Wage | Experienced Wage | Average Yearly Salary |
|----------------------------|--------------|-------------------------|-----------------|------------------|----------------|------------------|-----------------------|
| <b>Tool and Die Makers</b> | 1,660        | <i>Expected decline</i> | 9               | \$16             | \$26           | \$36             | \$53,100              |

Sources: EMSI 2012, O\*NET, Illinois WorkNet, American Community Survey 2009-2011 for Cook Co. Covers Standard Occupational Code 51-4111.

#### JOB DUTIES

- Plan sequences of operations for fabricating tools or dies.
- Select metals to be used based on properties such as hardness and heat tolerance.
- Use precision measuring instruments to check dimensions and alignments.
- Operate lathes, milling machines, and grinders to cut or shape parts to prescribed dimensions and finishes.

Visit [www.onetonline.org](http://www.onetonline.org) for more information about this occupation.

#### IS THIS JOB A GOOD FIT FOR ME?

|                    |   |
|--------------------|---|
| Education          | Most tool and die makers have at least some postsecondary education, such as a one or two year degree. They tend to have experience in manufacturing, and have undergone long term on the job training. Some employers prefer candidates with a manufacturing certification such as NIMS. |
| Skills/Aptitude    | Good candidates will have mechanical aptitude, critical thinking skills, and computer knowledge. An 8 <sup>th</sup> grade reading level (or 80% TABE score) is often required.  |
| Other Requirements | Workers may need to undergo criminal background checks and drug testing. Those with a record of violent crime or theft may not be eligible. Job may involve mandatory overtime and shift work.  |

#### ARE THERE OPPORTUNITIES FOR ADVANCEMENT?

Tool and die makers are nearing retirement age (57% are 49 years or older). This job is one of the higher jobs on the manufacturing career pathway, often obtained after gaining years of experience.

#### WHERE CAN I GO TO GET TRAINING?

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#### WHO ARE THE LARGEST EMPLOYERS IN THE INDUSTRY?

Special die and tool manufacturing (Metal Impact Corporation); metal stamping (National Lamination Co.); iron and steel forging (Jernberg Industries, Inc.).

#### WHAT OTHER JOB TITLES SHOULD I LOOK FOR IN HELP WANTED ADS?

Toolmaker, jig and fixture builder, tool and die machinist, tool repairer, trim die maker, die maker





## WELDER

### TARGET OCCUPATION PROFILE

**Welders, Cutters, Solderers, Brazers Welding, etc. Machine Setters, Operators, Tenders**

| Jobs in 2012 | Expected Growth by 2022 | Yearly Openings |
|--------------|-------------------------|-----------------|
| 3,742        | 9%                      | 100             |
| 752          | 5%                      | 20              |

| Entry Level Wage | Mid-Level Wage | Experienced Wage | Average Yearly Salary |
|------------------|----------------|------------------|-----------------------|
| \$12             | \$17           | \$26             | \$37,600              |
| \$10             | \$15           | \$32             | \$37,300              |

Sources: EMSI 2012, O\*NET, Illinois WorkNet, American Community Survey 2009-2011 for Cook Co. Covers SOC codes 51-4121 and 41-4122

#### JOB DUTIES

##### *Welders/Solderers*

- Align and secure parts prior to assembly.
- Select welding torches or soldering irons according to specifications or types of metals.
- Weld or join metal components or to fill holes or seams of fabricated metal products.

##### *Welding machine operators*

- Read work orders to determine job specifications.
- Enter operating instructions into computers to adjust and start welding machines.
- Feed pieces into welding machines to join or bond components and inspect completed items.

Visit [www.onetonline.org](http://www.onetonline.org) for more information about this occupation.

#### IS THIS JOB A GOOD FIT FOR ME?

|                    |   |
|--------------------|---|
| Education          | New entrants into the field will generally require a high school diploma or GED, and welders may require a postsecondary degree or certificate.   |
| Skills/Aptitude    | Good candidates will have mechanical aptitude, critical thinking skills, and computer knowledge. An 8 <sup>th</sup> grade reading level (or 80% TABE score) is often required.                  |
| Other Requirements | Workers may need to undergo criminal background checks and drug testing. Those with a record of violent crime or theft may not be eligible. Jobs may involve mandatory overtime and shift work. |

#### ARE THERE OPPORTUNITIES FOR ADVANCEMENT?

Welders who gain additional training and experience can advance to more skilled jobs, including supervisors, inspectors, or instructors.

#### WHERE CAN I GO TO GET TRAINING?

Visit [www.chicagolandwiatraining.com](http://www.chicagolandwiatraining.com) to search for WIA-certified training providers in Cook County, based on occupation, program cost, location, completion rate, employment, and wages.

#### WHO ARE THE LARGEST EMPLOYERS IN THE INDUSTRY?

Machine shops (Continental Field), rail transportation (Union Tank Car Dist Sales), temporary help services

#### WHAT OTHER JOB TITLES SHOULD I LOOK FOR IN HELP WANTED ADS?

Welder-fitter, fabricator, maintenance welder, finishing technician

