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| **[Machining Technology](http://www.lonestar.edu/5703/6257)** | **CF** | **K** | **M** | **NH** | **T** | **DL** |
| Certificate, Computer Numeric Control Operator I (C1.CNA1) |  |  |  |  |  |  |
| Certificate, Computer Numeric Control Operator II (C1.CNB1) |  |  |  |  |  |  |
| Certificate, Machinist I (C1.MAC1) |  |  |  |  |  |  |

Program Name: Machining Technology

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| LSC-CyFair  (CF) | LSC-Kingwood (K) | LSC-Montgomery (M) |
| LSC-North Harris (NH) | LSC-Tomball (T) | Distance Learning (DL) |
| Total Certificate or Degree Offered      -            Some Courses Offered | | |

**Definition of Occupation:**

Set up and safely operate manual and computer numerical control (CNC) machine tools that form chips by removing material from metal and plastic parts. May make machine set ups, set work piece and tool length offsets, and perform program edits.

**Description of typical work activities/transferable skills:**

* Selects, measures, assembles, and sets machine tools, such as drill bits and milling or cutting tools, using precision gauges and instruments.
* Mounts, installs, aligns, and secures tools, attachments, fixtures, and workpiece on machine, using hand tools and precision measuring instruments.
* Determines specifications or procedures for tooling set-up, machine operation, workpiece dimensions, or numerical control sequences, using blueprints, instructions, and machine knowledge.
* Calculates and sets machine controls to position tools, or regulate cutting depth, speed, feed, or coolant flow.
* Positions and secures workpiece on machine bed, indexing table, fixture, or dispensing or holding device.
* Loads control media, floppy drive, or RS232 cable connections, in machine controller or enters commands to retrieve programmed instructions.
* Starts automatic operation of computer numerical control (CNC) machine to machine parts or test setup, workpiece dimensions, or programming.
* Confers with supervisor or programmer to resolve machine malfunctions and production errors and obtains approval to continue production.
* Maintains machines and removes and replaces broken or worn machine tools, using hand tools.
* Milling, and turning
* Shaping parts by machine
* Operating metal or plastic working production machines
* Setting up machines
* Following equipment and machine operating instructions
* Following written machining work orders
* Following manufacturing blueprints and diagrams
* Inspecting products and materials
* Operating computer numerically controlled (CNC) machines

**Levels of Education:**

**Certificate:** Computer Numeric Control Operator I Certificate; Computer Numeric Control Operator II Certificate; Machinist I Certificate

**Associate:** N/A

***PLEASE NOTE: Transferability of degree or certificate to other institutions will vary depending on the institution and the department. Speak to a counselor or advisor for options.***

**Special Admissions/Prerequisite Courses:**

Students are required to take the THEA, ASSET, or COMPASS test and speak to a counselor for placement.

**Method of Delivery:**

Traditional/On-Campus

Distance Learning

Distance Learning and Traditional

Fast - Track

**Some typical job titles for** **Machining Technology:**

**Certificates:**

* Computer-Controlled Machine Tool Operators and Tenders, Metal and Plastic

**Associate Degree:**

* N/A

**Types of Companies that typically hire graduates:**

Machine setters, operators, and tenders—metal and plastic held about 1.3 million jobs in 2002. Approximately 9 of 10 jobs were found in manufacturing. About 38 percent of all employment was in these manufacturing industries: transportation equipment manufacturing, plastics and rubber products manufacturing, and machinery manufacturing.

**Workplace Skills:**

* Problem identification
* Equipment selection
* Operation monitoring
* Operation and control
* Product inspection
* Equipment maintenance

The following information is provided for individuals seeking career counseling. The MBTI provides information regarding an individual’s personality preferences and the Holland code provides information regarding an individual’s interest. If you are interested in learning more about how your interests and personality fit in with this and other career options, please see a career counselor at any of the NHMCCD campuses

# Myers-Briggs Type (MBTI):

* INTJ
* ESTP
* ENTP
* ENTJ

**Holland Interest Code:**

* Conventional
* Investigative
* Realistic

# Working Condition Requirements:

Most machine setters, operators, and tenders—metal and plastic work in areas that are clean, well lit, and well ventilated. Nevertheless, many operators require stamina, because they are on their feet much of the day and may do moderately heavy lifting. Also, these workers operate powerful, high-speed machines that can be dangerous if strict safety rules are not observed. Most operators wear protective equipment, such as safety glasses and earplugs, to protect against flying particles of metal or plastic and against noise from the machines. However, many modern machines are enclosed, minimizing the exposure of workers to noise, dust, and lubricants used during machining. Other required safety equipment varies by work setting and machine. For example, those in the plastics industry who work near materials that emit dangerous fumes or dust must wear face masks or self-contained breathing apparatus.

Most workers in the occupation put in a 40-hour week, but overtime is common during periods of increased production. Because many metalworking and plastics working shops operate more than one shift daily, some operators work nights and weekends.

# Industry Certification/Licenses:

Job opportunities and advancement can be enhanced as well by becoming certified in a particular machining skill. The National Institute for Metalworking Skills has developed standards for machine setters, operators, and tenders—metal. After taking a course approved by the organization and passing a written exam and performance requirement, the worker is issued a credential that signifies competence in a specific machining operation. The Society of Plastics Industry, the national trade association representing plastics manufacturers, also certifies workers in that industry. To achieve machine-operator certification, 2 years of experience operating a plastics-processing machine is recommended, and one must pass a computer-based exam.

For additional information visit: http://bls.gov/oco/ocos224.htm

**Employment Outlook:**

Employment of machinists is projected to [decline slowly](http://www.bls.gov/oco/oco20016.htm) by 3 percent over the 2006-16 decade because of rising productivity among these workers and strong foreign competition in the manufacture of goods. Machinists will become more efficient as a result of the expanded use of and improvements in technologies such as CNC machine tools, autoloaders, and high-speed machining. This allows fewer machinists to accomplish the same amount of work. Technology is not expected to affect the employment of machinists as significantly as that of some other production workers, however, because machinists monitor and maintain many automated systems. Due to modern production techniques, employers prefer workers, such as machinists, who have a wide range of skills and are capable of performing almost any task in a machine shop.

Despite the projected decline in employment, job opportunities for machinists should continue to be [good](http://www.bls.gov/oco/oco20016.htm) as employers value the wide-ranging skills of these workers. Also, many young people with the necessary educational and personal qualifications needed to become machinists prefer to attend college or may not wish to enter production occupations. Therefore, the number of workers learning to be machinists is expected to be less than the number of job openings arising each year from the need to replace experienced machinists who retire or transfer to other occupations.

Employment levels in this occupation are influenced by economic cycles—as the demand for machined goods falls, machinists involved in production may be laid off or forced to work fewer hours. Employment of machinists involved in plant maintenance, however, often is more stable because proper maintenance and repair of costly equipment remains critical to manufacturing operations, even when production levels fall.

***Source:*** **Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2008-09 Edition**

**Earnings:**

Median hourly wage-and-salary earnings of machinists were $16.71 in May 2006. The middle 50 percent earned between $13.14 and $20.82. The lowest 10 percent earned less than $10.29, while the top 10 percent earned more than $25.31. Median hourly wage-and-salary earnings in the manufacturing industries employing the largest number of machinists were:

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| --- | --- |
| Aerospace product and parts manufacturing | $18.46 |
| Motor vehicle parts manufacturing | 18.27 |
| Metalworking machinery manufacturing | 17.36 |
| Machine shops; turned product; and screw, nut, and bolt manufacturing | 16.24 |
| Employment services | 11.98 |

Apprentices earn much less than experienced machinists, but earnings increase quickly as they improve their skills. Also most employers pay for apprentices’ training classes.

***Source:* Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2008-09 Edition**

***PLEASE NOTE: Earnings and salaries will vary with industry, region and experience of employee.***