CNC Programmer [Level 1]
Job Description

Prime Responsibilities

You will be responsible for developing software programs that direct CNC (computer numerically controlled) machines to cut and shape metal or plastic to produce components for airplanes, automobiles, tools/dies/moulds and other industrial machined parts and tools. Using 3-dimensional computer designs (CAD models) and/or blueprints that define the configuration of the required component, CNC Programmers use CAM (computer-aided manufacturing) software programs to generate the program code that guides CNC machines to perform machining operations which result in precise finished components – efficiently and safely.

A CNC Programmer uses CAM software such as **Mastercam** to generate program code that controls the operations of a CNC machine. These CNC machines, such as mills, lathes, EDM, laser or waterjet cutters, follow the program code to perform a series of machining operations (rough cutting, finish cutting, shaping, pocketing, profiling, turning, drilling, tapping, threading, etc.) to produce the required components.

As a CNC Programmer, you would perform the following duties:

- analyze job orders
- review CAD models and/or blueprints
- make calculations to determine where materials should be cut
- define the best sequence of machining steps
- decide tools, speeds, feeds and fixtures to be used
- then generate program code using computer-aided-manufacturing (CAM) software to capture all these decisions
- run simulation tests
- conduct quality testing and correct/improve program code to increase efficiency, quality and safety;
- communicate with other programmers, shop floor management, machinists/setup and operators and engineering and sales staff to achieve this.

Working Conditions

A variety of manufacturing firms use CNC machines. Firms may be small and very specialized or much larger and produce a wide variety of items in long production runs.

You will spend a lot of your time at a CAM workstation. You will also spend time on the shop floor, working with CNC Machinists and others to achieve successful CNC programs to machine required components – precisely, efficiently and safely.

Technical Learning Outcomes

At the end of your training program, you will be able to do the following:

1. Write low level complexity CNC milling and turning programs that execute successfully, efficiently and safely.
2. Read code in programs and make alterations to existing programs.
3. Correctly read blueprints and analyze job orders.
4. Make a variety of calculations in order to determine where materials should be cut.
5. Determine the right tool path.
6. Decide on an approach that results in a correct, efficient structure of instructions.
7. Ensure that code that is written complies with all safety rules and regulations, including safety controls for data inputs, adjustments and edits.
8. Decide which cutting tools and speeds are appropriate, considering the design specifications, materials and range of tools that could be used.
9. Design realistic and valid simulations and evaluate test data to draw correct conclusions.
10. Explain why any line of code that the Programmer has written is necessary and what would happen if it is eliminated.
11. Analyze the behavior of code to diagnose a problem and find the underlying cause.
12. Demonstrate the appropriate use of version controls and libraries.
13. Evaluate simple to medium complexity programs and determine if improvements can be made to the code to increase efficiency, quality and safety.
14. Read and use a manufacturer's sale catalog to solve on the job problems.

Videos of CNC Programming and Machining

Below are three short YouTube videos about CNC programming and machining that demonstrate most of points described above and provide a job preview for you:

- Mastercam software https://youtu.be/cSR2qL9zriQ duration 2:50
- 3D Systems GibbsCAM https://youtu.be/KFvAhHZ8W7A duration 0:47
- Millturn CNC Machine https://youtu.be/kfsNz-vUoqA duration 5:43

Will I Like this Job and be Good at it?

If you can answer 'yes' to most of the following statements, then this job might be an excellent choice for you.

- Do you like working with computers / software?
- Do you have good math skills?
- Do you like working with CAD design programs?
- Do you have 3-dimensional thinking?
- Are you good with details?
- Do you enjoy working relatively independently?
- Do you like having responsibility and being accountable for your work?
- Do you have good communication skills?

What do I get out of this job?

The job pays well. Starting wages are usually between $20.00 and $24.00 per hour. After two years of experience, CNC Programmers are paid approximately $28/hour on average, and fully experienced CNC Programmers may earn $35/hour or more.

What else do I get?

This can be a life altering opportunity. Becoming a CNC Programmer can be an excellent decision for you. The job is interesting and pays well. It is in demand and is unlikely to be eliminated as manufacturing processes change and evolve. Long term employment and the stability it brings is a good thing to have in a job

Even better – it can provide a career for you in manufacturing. By applying yourself, learning more about machining, asking to learn about more difficult programming assignments, you could be become a candidate for other technical jobs. If you demonstrate other non-technical skills, you could become a quality specialist or a supervisor.