



CW High School

CNC Machining

1. CNC machining center setup (10.00%)

Learning Targets

1.1 I can identify the main components of a CNC mill.

Learning Target	Descriptor	Definition
4	Proficient	I can identify the main components of a CNC mill.
3	Developing	I can identify most of the components of a CNC mill.
2	Basic	I can identify some of the components of a CNC mill
1	Minimal	I can identify one or two of the components of a CNC mill
0	No Evidence	No evidence shown.

1.2 I can indicate a machine vise within +/- .0005"

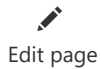
Learning Target	Descriptor	Definition
4	Proficient	I can indicate a machine vise within +/- .0005"
3	Developing	I can indicate a machine vise within +/- .001" with minimal help.
2	Basic	I can indicate a machine vise within +/- .002" with minimal help.
1	Minimal	I know what it means to indicate a vise, but I can not successfully indicate it.
0	No Evidence	No evidence shown.

1.3 I can load tooling, set tool height offsets, and change tooling using different tool holding devices.

Learning Target	Descriptor	Definition
4	Proficient	I can load tooling, set tool height offsets, and change tooling using different tool holding devices.
3	Developing	I can load tooling, change tooling using different tool holding devices, and adjust tool type and size on screen, but I can not properly adjust offsets.
2	Basic	I can load a tool and change different types of tool holders, but I can not properly adjust offsets.
1	Minimal	I can load a tool, but I don't know how to change tool holders or offsets.
0	No Evidence	No evidence shown.

1.4 I can load a part and accurately set work offsets for a given program using an edge finder and a dial test indicator.

Learning Target	Descriptor	Definition
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Learning Target	Descriptor	Definition
4	Proficient	I can load a part and accurately set work offsets for a given program using an edge finder and a dial test indicator.
3	Developing	I can load a part and accurately set work offsets for a given program using an edge finder but not a dial test indicator.
2	Basic	I can load a part and accurately set work offsets for a given program using an edge finder but I am still a little confused on what edges to choose.
1	Minimal	I know that offsets need to be set and I have attempted to do that, but I have not been successful.
0	No Evidence	No evidence shown.

2. Mill programming (40.00%)

Learning Targets

2.1 I can identify the common codes in a safe start line and describe what each code does.

Learning Target	Descriptor	Definition
4	Proficient	I can identify the common codes in a safe start line and describe what each code does.
3	Developing	I can identify most of the common codes in a safe start line and describe what code does.
2	Basic	I can identify most of the common codes in a safe start line and describe what some of the code do.
1	Minimal	I can identify a few of the common codes in a safe start line and describe what a couple of the code do.
0	No Evidence	No evidence shown.

2.2 I can write a basic code using a marker mounted in the spindle to draw letters with straight and curved lines.

Learning Target	Descriptor	Definition
4	Proficient	I can write a basic code using a marker mounted in the spindle to draw letters with straight and curved lines.
3	Developing	I can write a basic code using a marker mounted in the spindle to draw letters with straight lines but not curves.
2	Basic	I can write a basic code using a marker mounted in the spindle to draw letters but the code has a few errors and the letters don't look right.
1	Minimal	I can write a basic code using a marker mounted in the spindle to draw letters with straight, but there are too many errors for the program to be successful.
0	No Evidence	No evidence shown.



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2.3 I can write and run a program using cutter compensation to successfully mill a block to a given length.

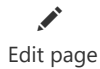
Learning Target	Descriptor	Definition
4	Proficient	I can write and run a program using cutter compensation to successfully mill a block to a given length.
3	Developing	I can write and run a program using cutter compensation to mill a block length, but the length is more than .01" from the given length.
2	Basic	I can write a program using cutter compensation to mill a block to a given length, but I have not run and cut the part.
1	Minimal	I have some of a program written and I understand cutter compensation.
0	No Evidence	No evidence shown.

2.4 I can explain the difference between various drilling cycles and write and run a code for drilling multiple holes using a drill cycle.

Learning Target	Descriptor	Definition
4	Proficient	I can explain the difference between various drilling cycles and write and run a code for drilling multiple holes using a drill cycle.
3	Developing	I can write and run a code for drilling multiple holes using a drill cycle, but I can't explain the differences between various drilling cycles.
2	Basic	I can write a code for drilling multiple holes using a drill cycle, but I can't explain the differences between various drilling cycles and I have not run the program yet.
1	Minimal	I have started writing a drilling program, but it is not complete.
0	No Evidence	No evidence shown.

2.5 I can calculate the appropriate feeds and speeds for mild steels, aluminum, and composite plastics and explain how depth of cut affects feeds and speeds.

Learning Target	Descriptor	Definition
4	Proficient	I can calculate the appropriate feeds and speeds for mild steels, aluminum, and composite plastics and explain how depth of cut affects feeds and speeds.
3	Developing	I can calculate the appropriate feeds and speeds for mild steels, aluminum, and composite plastics, but I cannot explain how depth of cut affects feeds and speeds.
2	Basic	I can calculate the appropriate RPM for mild steels, aluminum, and composite plastics, but not the feed rate



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Learning Target	Descriptor	Definition
1	Minimal	I know the RPM formula, but don't understand where to get cutting speed information.
0	No Evidence	No evidence shown.

2.6 I can explain the difference between G-code and conversational programming and use conversation programming face mill a part.

Learning Target	Descriptor	Definition
4	Proficient	I can explain the difference between G-code and conversational programming and use conversation programming face mill a part.
3	Developing	I can explain the difference between G-code and conversational programming and use conversation programming to write a code for facing a part, but I have not mill the actual part.
2	Basic	I can explain the difference between G-code and conversational programming and I have explored the menu options, but I have not used conversational programming
1	Minimal	I understand that conversational programming happens at the machine and not at a computer, but that's about it.
0	No Evidence	No evidence shown.

2.7 I can generate machining tool paths using CAM software and post process it for a given CNC machine and then machine the part to tolerance.

Learning Target	Descriptor	Definition
4	Proficient	I can generate machining tool paths using CAM software and post process it for a given CNC machine and then machine the part to tolerance.
3	Developing	I can generate machining tool paths using CAM software and post process it for a given CNC machine and then machine the part, but the part has tolerance or finish problems.
2	Basic	I can generate all of the machining tool paths using CAM software for a given part, but I have not posted it or machined it.
1	Minimal	I have a solid model in the CAM software and I have started to generate tool paths.
0	No Evidence	No evidence shown.



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3. CNC Turning set up (10.00%)

Learning Targets

3.1 I can identify the main components of a CNC lathe.

Learning Target	Descriptor	Definition
4	Proficient	I can identify the main components of a CNC lathe.
3	Developing	I can identify most of the components of a CNC lathe.
2	Basic	I can identify some of the components of a CNC lathe.
1	Minimal	I can identify one or two of the components of a CNC lathe.
0	No Evidence	No evidence shown.

3.2 I can load tooling, set tool height offsets, and change tooling using different tool holding devices.

Learning Target	Descriptor	Definition
4	Proficient	I can load tooling, set tool height offsets, and change tooling using different tool holding devices.
3	Developing	I can load tooling, change tooling using different tool holding devices, and adjust tool type and size on screen, but I can not properly adjust offsets.
2	Basic	I can load a tool and change different types of tool holders, but I can not properly adjust offsets.
1	Minimal	I can load a tool, but I don't know how to change tool holders or offsets.
0	No Evidence	No evidence shown.

3.3 I can load a part using different work holding devises and accurately set work zero for a given program.

Learning Target	Descriptor	Definition
4	Proficient	I can load a part using different work holding devises and accurately set work zero for a given program.
3	Developing	I can load a part using different work holding devises and accurately set work zero but i don't understand how it relates to a given program.
2	Basic	I can load a part using different work holding devises and accurately set work zero for z but not x.
1	Minimal	I can load a part using different work holding devises, but I can not set work zero.
0	No Evidence	No evidence shown.

4. Lathe programming (40.00%)

Learning Targets



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4.1 I can identify the common codes for a safe machine operation and describe what each code does.

Learning Target	Descriptor	Definition
4	Proficient	I can identify the common codes for a safe machine operation and describe what each code does.
3	Developing	I can identify most of the common codes for a safe machine operation and describe what each code does.
2	Basic	I can identify some the common codes for a safe machine operation and describe what what a few codes do.
1	Minimal	I can explain why it is important to have a safe startup when operating a CNC lathe, but I can not identify the codes or programming.
0	No Evidence	No evidence shown.

4.2 I can compare and contrast constant rpm and constant surface feet programming.

Learning Target	Descriptor	Definition
4	Proficient	I can compare and contrast constant rpm and constant surface feet programming.
3	Developing	I can explain constant rpm and constant surface feet programming, but I am not sure which one is best for different lathe operations.
2	Basic	I can name the two methods of programming RPM, but I can not explain them.
1	Minimal	I know that there are two different methods of programming RPM for a lathe, but I am not sure what they are.
0	No Evidence	No evidence shown.

4.3 I can write a basic code to face, rough turn an O/D, finish turn an O/D, and cut off a part and then machine that part.

Learning Target	Descriptor	Definition
4	Proficient	I can write a basic code to face, rough turn an O/D, finish turn an O/D, and cut off a part and then machine that part.
3	Developing	I can write a basic code to face, rough turn an O/D, finish turn an O/D, and cut off a part. The program proofs out with not errors, but I did not machine the part.
2	Basic	I can write a basic code to face, rough turn an O/D, finish turn an O/D, and cut off a part, but it has errors and will not run.
1	Minimal	I can write a basic code to face and finish turn an O/D for a part, but I have checked it for errors.



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Learning Target	Descriptor	Definition
0	No Evidence	No evidence shown.

4.4 I can generate machining tool paths using CAM software and post process it for a given CNC machine and then machine the part to tolerance.

Learning Target	Descriptor	Definition
4	Proficient	I can generate machining tool paths using CAM software and post process it for a given CNC machine and then machine the part to tolerance.
3	Developing	I can generate machining tool paths using CAM software and post process it for a given CNC machine and then machine the part, but the part has tolerance or finish problems.
2	Basic	I can generate all of the machining tool paths using CAM software for a given part, but I have not posted it or machined it.
1	Minimal	I have a solid model in the CAM software and I have started to generate tool paths.
0	No Evidence	No evidence shown.

Submitted on 2/17/2020 by Bob Morehead