



C.N.C. MILL

eSeries “GRADE SHEET”

Name: _____

Partner: _____

Period: _____

Rotation: _____

MODULE GRADE: COURSE GR. _____ }
 POST TEST _____ } → **MODULE AVE.=** _____

C. N. C. MILL “WORKSHEET” **TOTAL=** _____

LAB PERFORMANCE: _____
 (If you are absent, write ABS on the line for the day you miss and **DISCUSS** what you need to make up with the teacher) **LAB PERFORMANCE TOTAL=** _____

Extra Credit—Discuss this with the instructor before beginning!!!

WORD SEARCH	_____ (5)	“ STUDENT INITIAL ” BLOCK	_____ (5)	
MODULE REPORT	_____ (5)	TROPHY BASE	_____ (5)	
RESEARCH REPORT	_____ (5)	“LAKEVIEW BLOCK”	_____ (5)	
CHALLENGES	_____ (5)	MODULE NOTES	_____ (0-10)	
			TOTAL EXTRA CREDIT=	_____
			BONUS POINTS	*** _____

MILL “WORKSHEET”

LESSON 2 – You must have the items (PRZ & “Emulation” below checked by the instructor before milling your plastic for ALL Lessons.

Emulator & PRZ Checked by instructor for the “GEAR”. **T.I.:** _____ (20)
 One Printout of G & M code (for the group) from CNC Mill Level 5 software **Paper:** _____ (10)

LESSON 3- Work up to step 7.5. You won't cut this block out.

LESSON 4- Emulator & PRZ checked by instructor for the “Desk Organizer(part2). **T.I.:** _____ (20)
Impacts-Write notes from video clips. **Impacts Paper:** _____ (5)

LESSON 5

Emulator & PRZ checked by instructor for the “Coaster”. **T.I.:** _____ (20)

LESSON 6- Emulator & PRZ Checked by instructor for the bottom of the “Coaster”. **T.I.:** _____ (10)

LESSON 7-

Polylines, BezierArc, Pie and Miscellaneous Geometries in Fabricus **T.I.:** _____ (5)

LESSON 12-Career Guidance Report-Write your report in your Notes. **C.G. NOTES:** _____ (10)

STUDY GUIDE- TURNED IN. **Study Guide:** _____ (5)

Worksheet Total: _____

CNC Mill Study Guide for Post Test

1. A serious problem with Direct Numerical Control (NC) machines was that: (1-Numerical Control)
the punched tape could not be re-used.
if the computer failed, all of the attached machines could fail to work.
they could not share the electric outlet with the cooling system.
they only accepted Roman numerals.
2. The X, Y, and Z keys on the CNC Mill control keypad are used for which purposes? (1-Program Reference Zero)
set-up and calibration sum-up and collaboration start-up and certification send-off and celebration
3. In a PART program, G&M codes are: (1-G & M Codes[Hot Word])
statements added for documentation purposes only.
control or miscellaneous instructions.
units of measurement, gigameters and millimeters.
abbreviations for the type of machine being used.
4. The correct order for processing a PART source program is: (2-Introduction to DNC Mill Software, Activity Guide & Unit Review)
emulate, compile, download, then execute.
compile, execute, download, then emulate.
download, compile, emulate, then execute.
compile, emulate, download, then execute.
5. Which *Fabricus* toolbar contains the icons for displaying different design views? (3-Fabricus and in the Activity Guide)
Views toolbar Main toolbar Drawing toolbar Mill toolbar
6. Which *Fabricus* feature is the connection to CAM software? (3-"Generating a PART Program" Video)
Deport a GM File Import a GM File Report to GM File Export to GM File
7. The basic purpose of a design or engineering drawing is to describe the: (3-What is CAD?)
approximate dimensions and shape of an object.
exact dimensions and shape of an object.
tool and its required path to manufacture a part.
workings of a finished product.
8. Design changes should be made in the: (4-Making a Change)
supervisory design. control program. part design. PRZ program.
9. The files containing the production design and PART program should be: (4-Making a Change)
updated during testing of design changes.
deleted before design changes begin.
deleted before PART program changes begin.
replaced after testing is completed successfully.
10. Which of the following is an advantage of using CAD software?
improved filing and storing of designs faster part emulation excess free space on your computer is used
increased use of paper products
11. If a PART program fails or does not produce the desired part, what should you do?
Blame it on inferior materials and start over.
Blame it on poor design and write a program from scratch.
Analyze the PART program to try and locate the problem.
Change anything in the design until the program works.
12. A prototype is a:
new computer keyboard . model or original version of an object or living thing. professional secretary.
rule of etiquette used by diplomats.

13. Manufacturing costs include
labor and raw materials. raw materials and advertising. labor and advertising. advertising and sales.

14. A measure or value on which something depends is called a
paragon. parabola. paradox. parameter.

15. One good reason to change default names for design geometries is to
confuse other designers. display helpful names in program code. honor friends or family members.
enhance the design's appeal.

16. A vacuum vise can be used to
work with thin workpieces. clean the part after milling. collect scrap materials. move the tool spindle.

17. Some vises have no screws in order to
decrease the cost of the vise. increase the strength of the vise jaws. vary the angle of the vise jaws. speed
adjustment of the vise jaws.

18. A subroutine is used to
call a set of commands at multiple locations in a program.
repeat a set of commands a specified number of times.
execute two PART programs simultaneously.
execute two PART programs sequentially.

19. The parameter on the SUB command identifies the
number of times to execute a subroutine.
label or name of the subroutine.
program line to return control to after a subroutine.
positioning type to be used in a subroutine.

20. Research is a business expense which is used
to make annual budget estimates look accurate.
as input for important business decisions.
only when revenue from profits is available.
to keep the research department busy.

21. Which items are examples of variable costs?
inventory, rent, and labor
labor, distribution, and property taxes
distribution, inventory, and labor
insurance, rent, and equipment payments

22. Problem resolution always includes
providing a correction for a PART program in error.
blaming an individual for a PART program error.
adding comments to a PART program.
modifying a part design for a PART program.

23. PART programs generated by a CAD software product should always
create a perfect part. compile successfully. be updated to include a subroutine. run faster than a hand-written
program.

24. Computer Integrated Manufacturing involves computers for _____ management and _____ systems.
industrial ecological information automation anger solar upper electrical

25. Flexible manufacturing refers to the ability to
bend raw materials easily. adapt to consumer preferences. move machines easily. modify the price of
individual products.



CNC Mill

Study Guide 6.0

Circle the correct answers to these questions as you come upon them during your next seven lessons. This study guide can then be used as a resource for your final test!

1. Computer Numerical Control (CNC) is used to 1-Introduction to the CNC Mill (& in video).
program office computers, provide computer control of machines, count industrial production, control parts inventories
2. Today, CNC mills are used throughout the world by the manufacturing industry to improve high-volume production where 1-Introduction to the CNC Mill or complex patterns are manufactured.
computers, many identical parts, robots, magnetic impulses
3. The piece of material on which the milling machine produces accurately machined surfaces is known as the 1-The Milling Machine.
end mill, vise, workpiece, prototype
4. CAM stands for 1-Numerical Control (& in video).
Control Arm Manipulation, Computer-Aided Manufacturing, Computer-Avoidance Manual, Closed Applications Machining
5. Machine operators in a manufacturing environment may find it necessary to make changes to a CNC 1-Numerical Control (NC) program.
CONTROL, EMULATE, BATCH, PART
6. The first computer controlled machine tools were designed to be driven by 1-Numerical Control.
a point-and-click mouse, optical character readers, a punched tape, a joy stick
7. The development of 1-Numerical Control (NC) made computer numerical control possible.
light weight milling machines, remote computer facilities, industrial environmental controls, inexpensive and reliable microprocessors/computers
8. The CNC Mill software is also known as the 1-Numerical Control (CN) program.
PART, Lab-Volt, START, CONTROL
9. Included in the main parts of a CNC mill are the 1-The 5400 CNC Mill.
X-Y table, control panel, and the spindle; crankshaft arbor, router base, pneumatic leveler; a-frame, actuator, recycler; turntable, stylus, punctuator
10. The tool position must be set to a zero reference point known as the 1-Program Reference Zero before running a PART program.
PPG, RCO, PRZ, JOG
11. When operating a CNC mill, you should 1-Emergency Procedures if there is a situation where the tool is going to crash, a part comes loose, someone is being unsafe, or any other emergency.
leave the room immediately, reprogram the mill as quickly as possible, press the red EMERGENCY STOP button, access the Help menu
12. When someone presses and holds the STALL LIGHT OVERRIDE button on the mill control panel, they have initiated a 1-Emergency Procedure.
hard stop, restart, soft stop, rewind
13. When working with a machine tool, you should always 1-Safety Precautions.

wear eye protection, close all guards and safety doors, turn the machine off before cleaning or servicing, all of the above

14. The CNC machining industry commonly uses two programming codes: they are 2-G & M Codes.
X and Y, G and M, alpha and beta, linear and non-linear progression

15. The CNC Mill software 2-Introduction to CNC Mill feature eliminates the need to make a test part every time a program is created or updated.
import, export, edit, emulation

16. The 2-Introduction to CNC Mill Software is used to enter PART Program code in the CNC Mill software.
compiler, editor, freeloader, emulator

17. A CNC milling machine has an advantage in that a 2-sound bite "Preparation" has to be positioned only once for each program.
control cabinet, tool, machine operator, robot arm

18. To machine a component, the procedure order is: load you program, 2-"Review" Running the Mill, set the PRZ, and select Download Program via Serial port from the Mill menu.
close the machine guard, load the workpiece, load the CONTROL program, set the motor speed

19. A common method used in design drawings is called 3-What is CAD?.
draw-from-experience, draw-to-water, draw-from-a-hat, draw-to-scale

20. Engineering drawings include views of the 3-What is CAD?.
top, front, and side; top, left, and right; X, Y, and Z; top, side and back

21. Computer-Aided Design was developed to lessen the 3-What is CAD?.
need to compile PART programs, number of designs required, time and effort required for design, length of PART programs

22. The dimensions contained in an engineering design must use 3-What is CAD? measurements.
inch-foot, estimated, exact, divided

23. The 3-What is CAD? (in Video) are hand tools commonly used in design drawings.
refractor and compass, compact and protractor, protractor and compass, bypass and contractor

24. Computer-Aided Design was developed to reduce the time and effort required to design a 3-What is CAD? (and Question in Lesson Review mini quiz).
program, part, computer, CNC mill

25. CAD stands for 3-What is CAD?.
Computer-Aided Development, Controlled Automated Drawing, Control and Deliver, Computer-Aided Design

26. You can use Fabricus software to 3-Fabricus (& in Video) G & M file.
deport, import, report, export

27. A part design should be 4-Making a Change after it has been implemented successfully in production.
deleted, compiled, saved, modified

28. Missing data for design specifications should be 5-Design Input (yellow word "quickly").
left blank in the design, set using a standard value, investigated as soon as possible, estimated using the FIFO method

29. A part which is used to assemble other products or purchased by a consumer is called a 6-Part or Product.
by product, finished product, supplementary product, replacement product

30. A prototype is a 6-The Finished Product.

*new computer keyboard, model of an object of living thing, professional secretary, rule of etiquette used
by diplomats*

CNC MILL WORD SEARCH

D	T	W	J	I	T	E	V	W	E	L	Z	W	O	C	Y	D	L	R
E	X	R	X	O	N	C	O	Q	N	X	A	F	O	O	X	E	H	E
E	J	X	A	D	D	R	N	S	F	B	Y	C	V	N	S	O	U	T
F	K	O	M	P	K	H	W	C	S	N	F	D	I	T	E	K	V	U
V	V	I	O	P	S	A	L	G	I	X	E	L	P	R	C	U	P	P
O	L	P	I	E	T	A	L	U	M	E	J	B	E	O	E	X	P	M
L	I	E	E	K	K	X	G	C	O	L	M	D	V	L	V	M	N	O
S	C	T	Y	L	J	P	A	I	L	X	L	I	D	D	T	G	U	C
E	A	G	P	I	T	M	U	F	C	U	Z	W	B	T	U	K	S	N
R	A	G	G	R	O	O	V	G	O	Z	P	D	J	P	W	G	Q	K
W	Y	P	L	H	O	M	R	H	H	T	K	J	I	S	Q	T	X	P
A	O	Y	N	U	A	G	S	L	P	Q	F	X	C	I	R	V	E	K
M	I	L	L	I	N	G	R	Z	R	P	Y	U	A	H	K	B	K	B
M	Y	S	E	D	D	J	S	A	M	B	A	N	D	T	F	Y	W	R
U	H	T	N	D	Y	E	H	O	M	E	N	M	X	P	R	C	D	Q

MILL LEVEL 4 SOFTWARE PROGRAMMING SHEET #1

Program Information

Program Name	
Author	
Material	Plastic/Wax
Drawing No.	
Width (X)	
Depth (Y)	
Height (Z)	

PART Program

Line #	Instruction	Comment
00001		
00002		
00003		
00004		
00005		
00006		
00007		
00008		
00009		
00010		
00011		
00012		
00013		

MILL LEVEL 4 SOFTWARE PROGRAMMING SHEET #2

Program Information

Program Name	
Author	
Material	Plastic/Wax
Drawing No.	
Width (X)	
Depth (Y)	
Height (Z)	

Tools Used

Tool #	Description	Diameter	Radius
#9			

PART Program

Line #	Instruction	Comment
00001		
00002		
00003		
00004		
00005		
00006		
00007		
00008		
00009		
00010		
00011		
00012		
00013		
00014		
00015		
00016		
00017		
00018		
00019		

MILL LEVEL 4 SOFTWARE PROGRAMMING SHEET #3

Program Information

Program Name	
Author	
Material	
Drawing No.	
Width (X)	
Depth (Y)	
Height (Z)	

Tools Used

Tool #	Description	Diameter	Radius

PART Program

Line #	Instruction	Comment
00001		
00002		
00003		
00004		
00005		
00006		
00007		
00008		
00009		
00010		
00011		
00012		
00013		
00014		
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EXTRA CREDIT
MILL LEVEL 4 SOFTWARE PROGRAMMING SHEET #3 For Lesson 4
Level 2IS

Program Information

Program Name	
Author	
Material	Plastic/Wax
Drawing No.	
Width (X)	
Depth (Y)	
Height (Z)	

Tools Used

Tool #	Description	Diameter	Radius
#9			
#5			

PART Program

Line #	Instruction	Comment
00001		
00002		
00003		
00004		
00005		
00006		
00007		
00008		
00009		
00010		
00011		
00012		
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00017		
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00019		

PART Program for Level 2IS Lesson 4 (continued)

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