

GINOP – 6.1.3-17-2018-00033 Nyíregyházi Szakképzési Centrum – Idegen nyelvi készségek fejlesztése Nyíregyházán és vonzáskörzetében

**Angol C2 1 1 039 Angol nyelvi képzés KER A1 szinttől C2 szintig**

Képzés nyilvántartásba vételi száma: E-001291/2015/C002

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Szakmai segédanyag

a

## **Gépi és CNC forgácsoló szakma**

idegen nyelvi tananyagainak oktatásához

angol nyelv

B1 szint

Készítette: Serdültné Molnár Ildikó

Nyíregyházi SZC Inczedy György Szakképző Iskola és Kollégium



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## Reading

*Read the text in which Mr Titan Gilroy from Titans of CNC Academy, US, introduces the difference between manual milling machines and CNC milling machines.*

### Manual vs CNC machining

Today I'm going to explain the difference between a manual machine and a CNC machine. Manual machining is dear to my heart, twenty years ago when I got into this trade where I didn't know anything, I was put on a manual machine, it's how I learned how to cut metal.

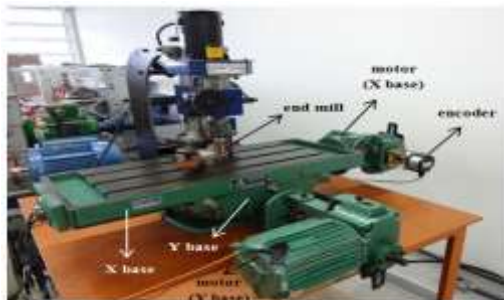
The **manual machine** has hand cranks. In the Y-direction, in this machine, we rotate the handle to engage the tool into the material. In the X-direction we rotate another handle, in the Z-direction, we lift up the spindle and lock it down. We also can engage the Z-Axis by raising or lowering the table. Cranking the handle raises the table.

So now let's go look at the **CNC machine**. Here we have a CNC machine, computer numerical controlled. Just like the manual mill, we have the same axis of movement but now we have servo motors, they are controlling those axes.

With the CNC machine, everything is automatic and we run off G codes and M codes, the programs are created through a CAD-CAM system. So we take a solid model, we bring it into the CAD-CAM system like fusion 360.

Then we call tools and we call out profiles and we run the tools around the profiles and we create a program. Once the program is complete, it gets posted. We then send the code to the machine. The machine reads the codes grabbing each tool and running it exactly like we did in the CAD-CAM system. You've got to grab all the tools, put them in special holders and then you have to put the tools in the machine. You have to zero all the tools to the part and then actually zero the part and you're ready to run your program.

When we look at run time, manual machining cannot compete with CNC machining. You can make this machine run lightning-fast, non-stop with no operator. Everything is automatic and efficient.



Manual milling machine



CNC milling machine

### Task A

Read the statements and mark them as true (T) or false (F), then correct the false sentences.

1. You can cut metal only on CNC cutting machines.
2. In the Y-direction, we lift up the spindle and lock it down.
3. We can engage the Z-Axis by raising the table.
4. CNC machines have a different axis of movement from manual machines.
5. CNC machines use codes.
6. We can program manual machines.
7. You don't need to run the tools around the profiles.
8. CNC machines grab the tool before they read the codes.
9. The tools are in special holders.
10. You don't need to zero all the tools to the part.
11. CNC machines work faster than manual machines.
12. You can manufacture more components on CNC machines because they are more efficient than manual ones.

### Task B

Study the technical words in the reading text. Then match the verbs and the nouns.

1. to rotate	a. the tool to the part
2. to control	b. the program
3. to raise/ to lower	c. the handle
4. to zero	d. metal
5. to run	e. the code to the machine
6. to cut	f. axes
7. to send	g. the table

To check your understanding of the manual and CNC machining you can watch the short video about the topic on the Internet at <https://www.youtube.com/watch?v=Gd-UqQksN3I>.

## Writing - Curriculum vitae

*Study this Curriculum Vitae (CV) which provides information about a metal cutting- and CNC machinist who is looking for a job.*

**László Kiss**

**Contact information**      **Email:** kiss.laszlo1234@gmail.com  
**Address:** 20 Szabadság út Nyíregyháza, 4400  
**Phone:** +36201234567  
**Date of birth: 1)** .....  
**Nationality:** Hungarian

**Objective**      **Self-motivated** metal cutting- and CNC machinist career entrant seeking a position in manufacturing. **Confident** to perform set-ups and operate CNC and manual metal fabricating equipment, such as lathe, vertical milling machine, drill press and grinder. **Successful in 2)** ..... **Working well** in a team to achieve common goals.

**Qualification**      **2022 Metal cutting- and CNC machinist**

**Education**      2020-2022 Cutting Technologies Ltd., Nyíregyháza as a dual training place  
Vocationally oriented training with contract  
**3)** .....  
Excelled in milling operations

2019-2022 Vocational Training Centre of Nyíregyháza, Inczédy György Vocational School and Dormitory, specialized in metal cutting and CNC cutting operations  
General Education, Basic Sectoral Education, Vocationally oriented training

**Key Skills**      Ability to perform machining processes: turning, grinding, milling  
Knowledge of materials, tools and measuring instruments  
**4)** .....  
Good knowledge of technical drawings and standards  
Ability to install and adjust devices  
Ability to load and check CNC machining programs and perform modification  
Computing: Microsoft Office, Word, Excel, writing CNC cutting programs, knowledge of G and M code programming

Good communication skills: active listening, friendliness, empathy  
**5)** .....  
Effective problem-solving skills: creativity, team-building

**Other knowledge**      Category 'A' and 'B' driving licence

**Language**      **6)** .....

**Interests** Travelling, Hiking, Fishing  
**References** 7) .....

**Task A** – *Some information has been left out from the CV. Your task is to complete the text by filling in the gaps (1-7) from the list (A-G) below.*

- A) Turning and milling components
- B) English - elementary level
- C) Positive attitude
- D) Ability to select and establish the tools for machining
- E) Available upon request
- F) Metal cutting- and CNC machinist trainee
- G) 15 July 2005

**Task B** – *With the help of the above sample write your CV. You are advised to use a CV maker from the Internet.*

## A covering letter

**Task A** - Read the following covering letter from a metal cutting- and CNC machinist. Some parts of the sentences have been removed. Your task is to match the numbers (1-8) with the correct letters (A-H) below.

20 Szabadság út  
Nyíregyháza 4400  
Hungary

25 June 2022

John Smith  
General Manager  
Metalworks Company Ltd.  
14 River Road, London N18 7AY

Application for the position of Metal cutting- and CNC machinist

Ref. No MC/P-02-06

Dear Mr Smith,

I am writing to apply for the metal cutting- and CNC machinist position advertised on the Internet.

I recently finished Inczedy György Vocational School and got my qualification. I studied the following subjects that I consider relevant **1)** ..... These are the Basics of mechanical engineering, Cutting technologies, and CNC operation and programming. In June, I took the vocational **2)** ..... I have gained the necessary experience during my vocational training. As I am a career entrant, **3)** .....my hands-on practical skills at your company.

Concerning my skills, I am experienced **4)** ....., especially I am great with turning and milling. Also, at school, I was recognized for interpreting information on mechanical materials and selecting the tools for machining. I am experienced in CNC milling operation, and I can also write **5)** ..... for CNC machines.

I am self-motivated and confident to perform well at my first workplace. I have good **6)** ..... and I also possess a positive attitude. I can speak English at elementary level.

In addition, I am available to take part in further training as I would like to develop my professional knowledge and skills. I consider these key strengths are important and they make me an ideal applicant **7)** .....

In my free time, I enjoy travelling abroad and I am an active member of a hiking group. Besides, I go fishing with my family in my free time.

I have attached a **8)** ..... for your review. I am available for an interview at your convenience. I hope you will consider my application for the position.

Yours sincerely,

László Kiss

- A) for the position
- B) in machining processes
- C) I want to improve
- D) communication and problem-solving skills
- E) copy of my CV
- F) subprograms and cycle instructions
- G) to the position you offer
- H) examination with good grades

**Task B** – Write your covering letter. You have seen this advertisement on the Internet and have decided to apply for this position. You can use the phrases and ideas from the covering letter above.

**Metal cutting- and CNC machinist**

Metalworks Company Ltd.

14 River Road, London N18 7AY

If you:

- are self-motivated and hardworking
- can work on the manual lathe and operate the CNC mill
- have a good knowledge of technical drawings
- have good problem-solving skills

then apply for this position. Send us an email at: metalworks.london@gmail.com

## Small talks

### Task A – At the job interview

*In the following interview with László Kiss, a metal cutting- and CNC machinist, some words are missing. Your task is to choose the correct word from the list (A- L) for each gap (1-12) in the text. Write the letter of the word next to the correct number.*

A (*applicant*): Good afternoon!

**B (*personnel manager*): Good afternoon! Come in! I believe you are László Kiss.**

A: That's right.

**B: Yes, do have a seat, please.**

A: Thank you.

**B: I am Peter Smith, the personnel manager. Could you speak about yourself, please?**

A: Yes, certainly. I finished Inczedy György Vocational School in June and now I am a skilled metal cutting- and CNC machinist. I did my vocational oriented **1)** ..... at Cutting Technologies Ltd. in Nyíregyháza where I gained a lot of experience Also, I have a good knowledge of CNC machining and especially I am good at turning and **2)** ..... operations. In my free time, I enjoy doing physical activities, like travelling and hiking. Besides, I regularly go fishing at a nearby lake.

**B: Why have you decided to choose our company?**

A: Well, I am looking for a challenging job. I have read that your company offers further training and has good opportunities for **3)** ..... Also, I would like to improve both my professional and English language skills.

**B: Yes, I understand. To what extent are you familiar with our company?**

A: I have visited your website and read about the company's profile, e. g. your metal cutting services, products. I got to know it was first a family business, which was founded in the 1990s. Now it has several international partners. You manufacture metal **4)** ..... for electrical and mechanical industries. Moreover, you focus on turning, milling, grinding and you have modern **5)** ....., such as CNC lathes and milling machines. Your company works with different metals, such as **6)** ....., stainless steel or titanium. You are improving your technological processes to meet your customers' needs.

**B: That's right. What are your strengths?**

A: I consider myself a self-motivated person because I am willing to learn new things and improve myself. I am also confident in my professional skills as I performed cutting **7)** ..... successfully during my vocational training. In addition, I have good communication **8)** ....., I pay attention to my partners by listening to their opinion and asking questions. I was on good terms with my classmates at school. I see myself as a friendly and empathetic person.



**B: What have you found to be useful during your vocational training?**

A: At my dual training place, the instructors were masters of the trade, they had a lot of experience in CNC machining and shared their knowledge and skills with students. So I could understand the **9)** ..... of CNC machines and program coding quite well. It allowed me to develop my professional skills.

**B: I see. What are your goals for the next years?**

A: I am planning to get a steady job and improve my practical skills. I would also like to spend some years in London and to gain experience in working abroad. Next, I want to be part of a good **10)** ..... where the colleagues support each other.

**B: All right. What do you do in your spare time?**

A: I prefer outdoor activities, like travelling, hiking or fishing. They keep me in a good shape and I enjoy being in the fresh air. It is important for me to socialize so I usually invite my friends to go fishing or to explore new places. In my hiking group, the **11)** ..... can make friends and share the enjoyment of the physical activity.

**B: OK. Thank you for coming to the interview.**

A: Thank you for your time. I think this position is **12)** ..... for me as my skills would meet your needs. I look forward to hearing from you. Goodbye!

**B: Goodbye!**

- A) equipment
- B) components
- C) skills
- D) team
- E) training
- F) members
- G) promotion
- H) tungsten
- I) suitable
- J) operation
- K) processes
- L) milling

**2. Role play.** Now talk in pairs and act out a job interview. You can use the phrases and ideas from the interview above.

**Student A:** Imagine that you are applying for a job and Student B is interviewing you. You are a metal cutting- and CNC machinist. Answer his questions.

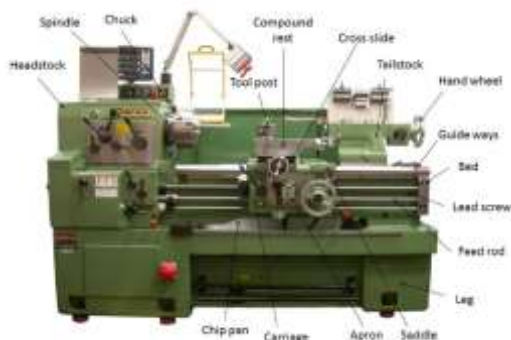
**Student B:** Imagine that you are a personnel manager and student A is applying for the job in the company you work for. Interview him.

The applicant should include the following points:

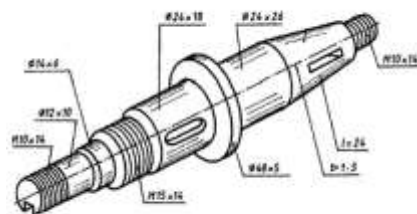
- introduction
- why he would like this position
- what he knows about the company
- his strengths and skills
- goals for future
- his interests

### Task B - In the machine-shop

**1.** Read the following dialogue in which a **metal cutting- and CNC machinist** and a **mechanical designer** are speaking about making a stepped shaft. Some parts of the sentences have been left out from the text. Your task is to match the numbers (1-8) with the correct letters (A-H)



Lathe machine



Stepped shaft

### Making a stepped shaft

**A (metal cutting-and CNC machinist): Good morning!**

B (mechanical designer): Good morning! I would like you to produce a stepped shaft. I have brought this technical drawing, too.

**A: Certainly. I can program the CNC lathe if we 1) ..... How many shafts do I have to manufacture?**

B: Only one, it's a unique part so it isn't worth using the CNC machine, we could also save time. You can 2) ..... on the engine lathe. In this way, we won't increase the production cost of the shaft.

**A: OK. What 3) ..... should I use?**

B: You can produce it from stainless steel or S235 structural steel. The latter is cheaper. Do we have stainless steel in stock?

**A: Yes, we do.**

B: All right. Then let's make the workpiece from stainless steel. Next, the part doesn't have its process plan. Can you produce the shaft without it or should we discuss the 4) .....?

**A: I think I can produce the shaft from the 5) ..... As I see, I will need to perform the following operations on the lathe: cutting into pieces, 6) ....., rough turning, finish turning, thread turning and boring.**

B: OK. And how will 7) ..... the machined surface?

**A: I will use the caliper and micrometer.**

B: Right.

**A: Now 8) ..... producing the shaft.**

B: OK. Goodbye!

**A: Goodbye!**

- A) operations in detail
- B) facing
- C) you check on
- D) need more parts

- E)** technical drawing
- F)** I'll start
- G)** type of material
- H)** perform the operations

**2. Role play.** *Talk in pairs. Act out the conversation. You can use the phrases and ideas from the dialogue above.*

**Student A:** *You are a metal cutting- and CNC machinist working for a metal fabricating company. The mechanical designer of the company wants you to produce a stepped shaft. You discuss the task with him.*

**You can include the following points:**

- offer to program the CNC lathe
- ask about the number/ material of the shaft
- you can produce the shaft from its technical drawing
- what turning operations you will perform
- you will use the caliper and micrometer for checking

**Student B:** *You are a mechanical designer. You would like the metal cutting- and CNC machinist to produce a stepped shaft. You discuss the task with him.*

**You can include the following points:**

- you need a unique stepped shaft
- why the manual lathe is better for producing the shaft
- you prefer stainless steel
- ask him if he can make the workpiece without the process plan
- ask him about checking on the machined surface

## Occupational health and safety



CNC milling machine

## SAFETY SIGNS

### Task A

Look at the safety signs of the CNC milling machine and read their meanings below.




### DANGER

1. 	2. 	3. 	4. 
5. 	6. 	7. 	8. 
9. 	10. 	11. 	12. 
	13. 	14. 	

### Meanings of the safety signs

- A) Risk of fire and explosion. Machine is not designed to resist or contain blasts or fire.
- B) Risk of serious physical injury. Machine cannot protect from toxins. Coolant mist, fine particles, chips, and fumes can be dangerous.
- C) Must wear safety glasses and hearing protection when operating or in the area of machine.
- D) Do not machine explosive or flammable materials or coolants.
- E) Risk of bodily injury. Serious cuts, abrasions and physical injury may result from slips and falls.
- F) Avoid using the machine in wet damp, or poorly lit areas.
- G) Risk of serious bodily injury. The enclosure may not stop every type of projectile.
- H) Read and understand the operator's manual and safety signs before using this machine.
- I) Electrocution hazard. Death by electric shock can occur.
- J) Risk of eye and injury. Flying debris into unprotected eyes can cause loss of sight.
- K) Severe injury can occur. Moving parts can entangle, trap and cut. Sharp tools or chips can cut easily.
- L) Double-check job setup before beginning any machining operations. Always follow safe machining practices. Do not operate with doors or windows open or guards removed
- M) Turn off and lock out system power before servicing.
- N) Ensure the machine is not in automatic operation before reaching inside.









Match the safety signs (from 1-14) with their meanings (from A-N). Then decide what type of signs they are and write your answers into the right column, as the example shows in the table. (1-1).

Warning signs and their meanings	Mandatory signs and their meanings	Prohibition signs and their meanings
		
e. g.: <b>1-I,</b>		

## Task B

Look at the safety signs of the CNC milling machine and read their meanings. Then try to find out the missing verbs (1-8) in the sentences. Choose them from the list below.

### WARNING

		<ul style="list-style-type: none"> <li>➤ Severe injury can occur. Moving parts can entangle and trap.</li> <li>➤ Always 1) _____ loose clothing and long hair.</li> </ul>
		<ul style="list-style-type: none"> <li>➤ Impact hazard. Machine components can crush and cut.</li> <li>➤ Do not 2) _____ any parts of the machine during automatic operation. Always keep clear of moving parts.</li> </ul>
		<ul style="list-style-type: none"> <li>➤ Risk of serious bodily injury.</li> <li>➤ 3) _____ safe clamping practices. Inadequately clamped parts can be thrown with deadly force. Securely 4) _____ workpieces and fixtures.</li> </ul>
		<ul style="list-style-type: none"> <li>➤ Moving parts can crush.</li> <li>➤ The tool changer will 5) _____ in and crush your hand.</li> </ul>

- Do not 6) \_\_\_\_\_ untrained personnel to operate this machine.
- Do not alter or modify the machine in any way.
- Do not 7) \_\_\_\_\_ this machine with worn or damaged components.
- No user-serviceable parts inside.
- The machine must be 8) \_\_\_\_\_ or serviced by authorised service technicians only.

*(operate, allow, secure, repaired, follow, clamp, move, handle)*

## Wordlist

1. 5- axis machine - 5- tengelyes szerszám gép
2. accuracy - pontosság
3. auxiliary materials - segédanyagok
4. axis - tengely
5. boring - furatesztergálás
6. CAD (Computer Aided Design) - számítógéppel segített tervezés
7. CAD-CAM system - CAD-CAM rendszer
8. CAM (Computer Aided Manufacturing) - számítógéppel segített gyártás
9. chip - forgács
10. clamping device - szorító készülék
11. clamping/gripping/carrier/fixing devices - befogó/megfogó/menesztő/rögzítő eszközök
12. CNC (Computer Numerical Control) machine - számítógép vezérelt gép
13. CNC Machining Center - CNC megmunkáló központ
14. CNC machining cycles - CNC megmunkálási ciklusok
15. complex precision CNC machining operation - összetett precíziós CNC megmunkálási művelet
16. component - alkatrész
17. computer- aided measurement - számítógéppel támogatott mérések
18. cutting - forgácsolás
19. cutting into pieces - darabolás
20. cutting machine - forgácsológép
21. cutting point - szerszámcsúcs, késcsúcs
22. cutting speed - forgácsoló sebesség
23. cutting technologies - forgácsolási eljárások
24. cutting tool - forgácsoló szerszám
25. cycle instruction - ciklusutasítás
26. diameter - átmérő
27. drill press - oszlopos fúrógép
28. drilling - fúrás
29. efficiency - hatékonyság
30. external surface - külső felület
31. facing - oldalazás
32. feed motion - előtoló mozgás
33. fine surface treatment - finom felületi megmunkálások
34. fire and environmental protection regulation - tűz-és környezetvédelmi előírások
35. grinding - köszörülés
36. holder - befogó készülék
37. Horse power (HP) - gépi lóerő



38. initial workpiece - kiinduló munkadarab
39. insert - lapka
40. machine-turned - géppel esztergált
41. machine error - géphiba
42. machine maintenance - gépkarbantartás
43. machine shop - forgácsoló műhely
44. machine tool - szerszám gép
45. machined surface - megmunkált felület
46. measuring instrument - mérőeszköz
47. mechanical engineering - gépészet
48. metal cutting- and CNC machinist - gépi és CNC forgácsoló
49. metal cutting machinist – gépi forgácsoló
50. metal cutting process - fémforgácsolási eljárás
51. milling - marás
52. milling machine - marógép
53. modification - módosítás
54. numerically controlled machine tool (NC- machine tool) - számjegyvezérlésű (NC) szerszám gép
55. prefabricated elements - előre gyártott elemek
56. pre-measured tool - előre bemért szerszám
57. primary motion - főmozgás
58. protective equipment - védőfelszerelés
59. quality assurance - minőségbiztosítás
60. Revolutions Per Minute/ (RPM) - percenkénti fordulatszám
61. semi-finished work piece - félgyártmány
62. shaping - gyalulás
63. sharpening of tools - szerszámélezés
64. shop drawing - műhelyrajz
65. slotting - vésés
66. slotting machine - vésőgép
67. spindle type - főorsó típus
68. standard - szabvány
69. stepped shaft - lépcsős tengely
70. sub- programme –alprogram
71. surface grinder - síkköszörű
72. table of joints - illesztés táblázat
73. technical drawing - műszaki rajz
74. technical table - műszaki táblázat
75. the know-how of metal cutting - forgácsolási ismeretek
76. threading - menetesztergálás

77. to adjust - beállít
78. to carry out - elvégez
79. to check - ellenőriz
80. to deburr edges - éleket sorjáz
81. to install devices of the workpiece - a munkadarab eszközeit felszereli
82. to load - betáraz
83. to load machine configuration parameters - gépbeállítási paramétereket betölt
84. to machine - gépen megmunkál
85. to manufacture - gyárt (alkatrészt)
86. to perform - végez
87. to prepare - előkészít
88. to produce - legyárt, előállít
89. to repair - javít
90. to select - kiválaszt
91. to shape - alakít
92. to write a CNC machining programme - CNC megmunkálási programot ír
93. tolerance table - tűrés táblázat
94. tool correction - szerszámkorrekció
95. tool mark - forgácsolási barázda
96. traditional machine-based - hagyományos gépi
97. turning - esztergálás
98. vibration damping - rezgéscsillapítás
99. work surface - megmunkálandó felület
100. workpiece - munkadarab

## References

### Reading

*adapted from:* <https://www.youtube.com/watch?v=Gd-UqQksN3I> (Utolsó letöltés: 2021. 07. 28.)

[https://www.researchgate.net/figure/Vertical-milling-machine\\_fig1\\_281367697](https://www.researchgate.net/figure/Vertical-milling-machine_fig1_281367697) (Utolsó letöltés: 2021. 07. 28.)

CNC milling machine (own picture, in Vocational Training Centre of Nyíregyháza)

### Small talk

<https://www.mechanicalbooster.com/2016/11/what-is-lathe-machine-main-parts-operations-working.html> (Utolsó letöltés: 2021. 07. 28.)

<https://tudasbazis.sulinet.hu/hu/szakkepzes/konnyuipar/muszaki-rajz/abrazolasok/tengelyek> (Utolsó letöltés: 2021. 07. 28.)

## Occupational health and safety

Safety signs on CNC milling machine (own picture, in Vocational Training Centre of Nyíregyháza)

<https://www.beaverswood.co.uk/what-are-the-4-types-of-safety-signs> (Utolsó letöltés: 2021. 07. 28.)