NATIONAL QUALIFICATION

12UY0082-4

CNC PROGRAMMER

LEVEL 4

REVISION NO: 01

AMENDMENT NO: 01

VOCATIONAL QUALIFICATIONS AUTHORITY

Ankara, 2019

PREFACE

CNC Programmer (Level 4) National Qualification was developed by the Ankara Chamber of Industry assigned by the VQA in accordance with the provisions of the Regulation on the Development of National Occupational Standards and National Qualifications published in the Official Gazette No.29507 and dated 19/10/2015, and the Regulation on the Procedures and Principles for the Establishment, Duties, and Operation of the Vocational Qualifications Authority Sector Committees published in the Official Gazette No.25713 and dated 27/11/2007 and assessed after receiving the opinions of relevant institutions and organizations in the sector, and approved by the VQA's Executive Board upon being examined by the VQA's Machinery Sector Committee.

CNC Programmer (Level 4) National Qualification has been revised by Decision No.2019-83 and dated 27.06.2019 of the VQA Executive Board.

The CNC Programmer (Level 4) National Qualification has been amended by the decision of the Presidency dated 10.06.2020 and numbered 1570.

Vocational Qualifications Authority

INTRODUCTION

The basic criteria for the development of national qualification, its examination by the sector committees, and its approval by the VQA Executive Board are specified in the Regulation on the Development of National Occupational Standards and National Qualifications.

The basic criteria for national qualifications are defined as follows:

a) National qualifications shall be developed on the basis of national occupational standards or international standards.
b) National qualifications shall be developed with a participatory approach and the opinions and contributions of relevant parties shall be received.
c) National qualifications cover matters related to occupational health and safety, environmental safety and quality, regarding the occupational field.
d) National qualifications shall be written to be understood by users.
e) National qualifications encourage individuals to develop themselves and make progress in the occupation, within the framework of the lifelong learning principle.
f) National qualifications do not contain any discriminative components, either explicit or implicit.
g) National qualifications include components that ensure measuring the knowledge, skills, and competency of individuals within the scope of quality assurance.

12UY0082-4 CNC PROGRAMMER NATIONAL QUALIFICATION

1	**NAME OF THE QUALIFICATION UNIT**	CNC Programmer
2	**REFERENCE CODE**	12UY0082-4
3	**LEVEL**	4
4	**PLACE IN THE INTERNATIONAL CLASSIFICATION**	ISCO 08: 3115
5	**TYPE**	-
6	**CREDIT VALUE**	-
7	**A) PUBLICATION DATE**	26.09.2012
	B) REVISION NO / AMENDMENT NO	Revision No: 01 Amendment No: 01
	C) REVISION/AMENDMENT DATE	Revision No 127.06.2019- 2019/83 Amendment No. 01 10/06/2020-1570
8	**AIM**	This qualification has been developed to ensure that the CNC Programmer (Level 4) occupation is carried out by skilled people and to enhance the quality of the works towards the purposes of; • Defining the qualifications, knowledge, skills and competencies that the candidates should possess, • Providing the candidates with the opportunity to prove their vocational qualification with a valid and reliable certificate, • Providing reference and resource to the education system, testing and awarding bodies.
9	**OCCUPATIONAL STANDARD(S) THAT FORM(S) THE BASIS FOR THE QUALIFICATION UNIT**	
12UMS0216-4 CNC Programmer National Occupational Standard		
10	**REQUIREMENT(S) FOR ENTERING THE QUALIFICATION EXAM**	
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11	**STRUCTURE OF QUALIFICATION**	
11-a) Mandatory Units		
12UY0082-4/A1: Occupational Health and Safety, Environmental Safety and Quality 12UY0082-4/A2 Programming and Production in CNC Machines		
11-b) Elective Units		
-		
11-c) Alternatives for Grouping Units and Additional Learning Outcomes		
The candidate must succeed in all of the compulsory qualification units to receive the qualification certificate.		
12	**ASSESSMENT AND EVALUATION**	
The candidates willing to achieve the CNC Programmer (Level 4) Vocational Qualification Certificate		

are subjected to theoretical and practical exams defined in the units. In order for the candidates to achieve the qualification certificate, they must succeed in both theoretical and practical exams. Theoretical and practical exams in the qualification units can be done separately for each unit or together. However, each unit must be assessed independently. The validity period of qualification units is 2 years from the date of achievement of the unit. In order to achieve a qualification by combining the qualification units, all units must remain valid.		
13	**VALIDITY PERIOD OF THE CERTIFICATE**	The validity period of the qualification certificate is 5 years.
14	**OBSERVANCE FREQUENCY**	-
15	**ASSESSMENT AND EVALUATION METHOD TO BE USED IN CERTIFICATE RENEWAL**	At the end of the validity period of five (5) years, the performance of the certificate holder shall be assessed using at least one of the methods defined below; a) Submitting records indicating that they worked in the relevant field for at least two years in total or for the last six months within the 5-year document validity period (such as service transcript, reference letter, contract, invoice, portfolio), b) Taking the practical exams defined for the qualification units within the scope of qualification. For the candidates with a positive assessment result, the validity period of the certificate shall be extended for another 5 years.
16	**ORGANIZATION(S) DEVELOPING THE QUALIFICATION**	Ankara Chamber of Industry (ASO)
17	**SECTOR COMMITTEE VERIFYING THE QUALIFICATION**	VQA's Machinery Sector Committee
18	**VQA EXECUTIVE BOARD'S APPROVAL DATE and NUMBER**	26.09.2012 – 2012/69 First Revision: 27.06.2019-2019/83

12UY0082-4/A1 OCCUPATIONAL HEALTH AND SAFETY, ENVIRONMENT AND QUALITY QUALIFICATION UNIT

1	**NAME OF THE QUALIFICATION UNIT**	Occupational Health and Safety, Environmental Safety and Quality
2	**REFERENCE CODE**	12UY0216-4/A1
3	**LEVEL**	4
4	**CREDIT VALUE**	-
5	**A) PUBLICATION DATE**	26.09.2012
	B) REVISION NO / AMENDMENT NO	Revision No: 01 Amendment No: 01
	C) REVISION/AMENDMENT DATE	Revision No 127.06.2019- 2019/83 Amendment No. 01 10/06/2020-1570
6	**THE OCCUPATIONAL STANDARD THAT FORMS THE BASIS FOR THE QUALIFICATION UNIT**	
12UMS0216-4 CNC Programmer National Occupational Standard		
7	**LEARNING OUTCOMES**	

Learning Outcome 1: Explaining occupational health and safety, and environmental protection measures.

Performance Criteria:

1.1: Defines legal and workplace rules regarding occupational health and safety.
1.2: Explains mitigation of risk factors related to occupational health and safety.
1.3: Explains the emergency procedures to be applied in case of danger.
1.4: Explains environmental protection measures.

Learning Outcome 2: Describes the quality requirements of work processes and work environment.

Performance Criteria:

2.1: Explains the methods for ensuring quality.
2.2: Lists the faults and errors detected during operation.

8	**ASSESSMENT AND EVALUATION**

8 a) Theoretical Exam

Multiple Choice Exam: The theoretical exam for the A1 unit shall be applied as per the "Information" checklist in Annex A1-2. The theoretical exam should be applied in the form of multiple-choice questions with at least 4 choices and a minimum of 25 questions with equal weight per examination. No points shall be deduced from the overall score for wrong answers to any of the questions and 1,5 minutes of time shall be granted for candidates for each question. A candidate who answers at least 60% of the questions correctly in the written examination shall succeed. The questions in the examination should measure all knowledge statements (ANNEX A1-2) intended to be measured by the theoretical exam in this unit.

8 b) Practical Exam

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8 c) Other Conditions Regarding Assessment and Evaluation

The candidate must pass the T1 exam in order to be considered successful in the mentioned unit. The validity period of the qualification unit is 2 years from the date of achievement of the unit.

9	**INSTITUTION/ORGANIZATION(S) DEVELOPING THE QUALIFICATION UNIT**	Ankara Chamber of Industry (ASO)
10	**SECTOR COMMITTEE VERIFYING THE QUALIFICATION UNIT**	VQA's Machinery Sector Committee
11	**VQA EXECUTIVE BOARD APPROVAL DATE and NUMBER**	26.09.2012 – 2012/69 First Revision: 27.06.2019-2019/83

QUALIFICATION UNIT ANNEXES

ANNEX A1-1: Information on the Recommended Training for the Awarding of the Qualification Unit

Candidates shall be recommended to complete a program with the below-described training content for this unit.

Training Content:

1. Occupational health and safety and environment
    1.1. Legal Legislation on Occupational Health and Safety
    1.2. Hazards and risks and the measures to be taken against them
    1.3. Emergencies and the tasks to be done in emergencies
    1.4. Alarm signals and danger signs
    1.5. Fire and fire protection
    1.6. Environmental protection measures
    1.7. Environment and environmental pollution
    1.8. Recyclable waste and measures to be taken regarding such waste.
    1.9. Hazardous waste
    1.10. Environmental risks arising from production
2. Quality Requirements
    2.1. Task documentation
    2.2. Requirements of quality management systems
    2.3. Keeping records
    2.4 Errors and faults that may occur during tasks, and methods for detecting such errors and faults.

ANNEX A1-2: Checklist to be Used in the Assessment and Evaluation of the Qualification Unit

a) INFORMATION

No.	Knowledge Statement	NOS-Related Department	Qualification Unit Performance Criteria:	Assessment Tools
INFO.1	Lists the rules on occupational health and safety	A.1.1	1.1	T1

No.	Knowledge Statement	NOS-Related Department	Qualification Unit Performance Criteria:	Assessment Tools
INFO.2	Lists the personal protective equipment suitable for the job.	A.1.2 A.1.3	1.1 1.2	T1
INFO.3	Lists the rules on keeping the workstation and equipment in order.	A.1.4	1.1	T1
INFO.4	Lists the occupational health and safety protection and intervention tools.	A.1.4	1.1 1.2	T1
INFO.5	Lists the usage characteristics for occupational health and safety protection and intervention tools.	A.1.4	1.1 1.2	T1
INFO.6	Lists the warning signs and plates suitable for the performed work.	A.1.5	1.2	T1
INFO.7	List the hazards and risks associated with the work they carry out.	A.2.1	1.1 1.2	T1
INFO.8	Lists the measures to be taken for reducing the risk factors.	A.1.7 A.2.2	1.1 1.2	T1
INFO.9	Lists the potentially hazardous situations.	A.3.1	1.3	T1
INFO.10	Matches the dangerous situations that cannot be immediately averted with the relevant agencies that must be contacted.	A.1.6	1.3	T1
INFO.11	Lists the exiting or escaping procedures in cases of emergency.	A.1.5	1.3	T1
INFO.12	Lists the environmental impacts related to the conducted tasks.	A.2.1	1.4	T1
INFO.13	Lists the recyclable materials.	A.2.4	1.4	T1
INFO.14	Explains the sorting and classification of recyclable materials.	A.2.4 A.2.5	1.4	T1
INFO.15	Lists the dangerous and hazardous wastes.	A.2.3	1.4	T1
INFO.16	Lists the principles for the separation of dangerous and hazardous wastes from other materials.	A.2.3	1.4	T1
INFO.17	Lists the safe storage requirements for combustible and flammable materials.	A.2.1	1.4	T1
INFO.18	Lists the proper hardware, materials and equipment to be used against spills and leaks.	A.2.2	1.4	T1
INFO.19	Lists the principles for using business resources economically and efficiently.	B.3.2	1.4	T1
INFO.20	Lists the protective and preventive maintenance tasks for the used equipment.	A.3.1 B.4.1	2.1	T1
INFO.21	Lists the quality system requirements set forth in the instructions.	A.3.1 B.1.3	2.1	T1
INFO.22	Lists the tolerances and deviations allowed in practice.	A.3.1 B.1.3 C.1.2	2.1	T1

No.	Knowledge Statement	NOS-Related Department	Qualification Unit Performance Criteria:	Assessment Tools
INFO.23	Lists the errors and faults that are likely to occur while working.	A.3.1	2.2	T1

12UY0082-4/A2 PROGRAMMING AND PRODUCTION IN CNC MACHINES QUALIFICATION UNIT

1	**NAME OF THE QUALIFICATION UNIT**	Programming and Production in CNC Machines
2	**REFERENCE CODE**	12UY0082-4/A2
3	**LEVEL**	4
4	**CREDIT VALUE**	-
5	**A) PUBLICATION DATE**	26.09.2012
	B) REVISION NO / AMENDMENT NO	Revision No: 01 Amendment No: 01
	C) REVISION/AMENDMENT DATE	Revision No 127.06.2019- 2019/83 Amendment No. 01 10/06/2020-1570
6	**THE OCCUPATIONAL STANDARD THAT FORMS THE BASIS FOR THE QUALIFICATION UNIT**	
12UMS0216-4 CNC Programmer (Level 4) National Occupational Standard		
7	**LEARNING OUTCOMES**	

Learning Outcome 1: Makes pre-work preparations.
Performance Criteria:
1.1. Checks the measurement and control tools.
1.2. Prepares the tools, apparatus and equipment to be used.
1.3. Adjusts the settings of the CNC Machines.

Learning Outcome 2: Programs the machine
Performance Criteria:
2.1. Decides on the CNC programming method.
2.2. Performs CNC Programming.
2.3. Controls the CNC Program.

Learning Outcome 3: Runs the CNC program on the machine.
Performance Criteria:
3.1. Runs the program on the automatic operation and machines the workpiece in a controlled manner.
3.2. Prepares the piece ready for serial production.
3.3. Turns off the machine.

Learning Outcome 4: Applies the OHS, environmental and quality requirements.
Performance Criteria

4.1: Apply the OHS rules in the works they carry out. **4.2:** Apply the environmental protection measures in the works they carry out. **4.3:** Apply the quality requirements in the works they carry out.	
8	**ASSESSMENT AND EVALUATION**
8 a) Theoretical Exam	
Multiple Choice Exam: The theoretical exam for the A2 unit shall be applied as per the "Information" checklist in Annex A2-2. The theoretical exam should be applied in the form of multiple-choice questions with at least 4 choices and a minimum of 20 questions with equal weight per examination. No points shall be deduced from the overall score for wrong answers to any of the questions and 1,5 minutes of time shall be granted for candidates for each question. Candidates who achieve a score a minimum % of 60 shall be deemed successful. The questions in the examination should measure all knowledge statements (Annex A2-2) intended to be measured by the theoretical exam in this unit.	
8 b) Practical Exam	
P1: The practical exam for A2 unit is realized as per the "Skills and Competencies" checklist given in Annex A2-2. The critical steps that must be accomplished by the candidate shall be specified in the skills and competencies checklist. In order for a candidate to succeed in the practical exam, they should score at least 80 out of 100 points (80%) in the overall examination, provided that they succeed in all the critical steps. The duration of the practical exam should correspond to the time under actual practical conditions. The practical exam shall be carried out in a real or realistically arranged work environment. All expressions of skill and competency (Annex A2-2) should be measured with a practical exam.	
8 c) Other Conditions Regarding Assessment and Evaluation	
The validity period of the examinations foreseen for the unit shall be 1 year from the date of achievement of the examination. In order to achieve the unit, the time between achieved examination dates cannot exceed one year. The validity period of qualification units is 2 years from the date of achievement of the unit. If the candidate displays a behavior that could jeopardize their own safety and the safety of others, the examination shall be terminated.	
9	**INSTITUTION/ORGANIZATION(S) DEVELOPING THE QUALIFICATION UNIT** — Ankara Chamber of Industry (ASO)
10	**SECTOR COMMITTEE VERIFYING THE QUALIFICATION UNIT** — VQA's Machinery Sector Committee
11	**VQA EXECUTIVE BOARD APPROVAL DATE and NUMBER** — 26.09.2012 – 2012/69 First Revision: 27.06.2019-2019/83

QUALIFICATION UNIT ANNEXES

ANNEX A2-1: Information on Recommended Training for Acquisition of a Qualification Unit
Candidates shall be recommended to complete a program with the below-described training content for this unit.

Training Content:

1. Pre-work preparation tasks
   1.1. Selection of the measurement and control tools and checking their suitability for use
   1.2 Use of measurement and control tools
   1.3. Procedures for determining and preparing tools, equipment, and materials suitable for the task
   1.4 Use of tools, equipment and material

1.5. CNC Machines and Setting on CNC Machines
1.6 Use of CNC Machines
2. Machine programming tasks
2.1. CNC programming methods
2.2. CNC programming tasks
2.3 Control tasks on CNC program
3. Tasks for running the CNC program on the machine
3.1. Piece machining tasks
3.2. Preparation of the machine for serial production
3.3. Turning off tasks of the machine
4. Occupational Health and Safety, Environmental Protection and Quality Requirements
4.1. Implementation of OHS instructions in work processes
4.2. Using personal protective equipment
4.3. Requirements of using warning signs and plates
4.4. Emergencies and the tasks to be done in emergencies
4.5. Environmental protection requirements in the working environment
4.6. Tasks to be performed regarding wastes generated in the working environment
4.7. Implementing quality requirements
4.8. Use of machinery, equipment, tools, and devices in accordance with quality requirements
5. Documents used during the tasks
5.1. Work order and determination of order of task according to the work order
5.2. Working drawing and determination of the order of task in accordance with the working drawing

ANNEX A2-2: Checklist to be Used in the Assessment and Evaluation of the Qualification Unit

a) INFORMATION

No.	Knowledge Statement	NOS-Related Department	Qualification Unit Success Criteria	Assessment Tools
INFO.1	Explains the work order or working drawing.	C.1.1	1.1	T1
INFO.2	Explains the preparation processes for the CNC machine and other units ready for operation.	D.1.1 D.1.2	1.3	T1
INFO.3	Explains the tools, apparatus and equipment to be used.	B.3.1 B.3.2 C.1.2 C.3.1 D.4.1 D.4.2	1.2 1.3	T1
INFO.4	Explains how to use the measurement and control tools.	D.3.4 D.4.4	1.1	T1
INFO.5	Explains tool chuck and clamping methods.	C.3.1 C.3.2	1.2	T1
INFO.6	Explains the characteristics of the cutting tools.	C.2.1 C.2.2 C.2.5	1.2	T1
INFO.7	Explains the methods of clamping the workpiece to the machine.	D.2.3 D.4.2 D.4.3	1.3	T1

No.	Knowledge Statement	NOS-Related Department	Qualification Unit Success Criteria	Assessment Tools
INFO.8	Explains the CNC coding method.	E.1.1 E.1.2	2.1	T1
INFO.9	Explains the user coordinate system (piece setting) and the measurement system (metric/inch) of the operation.	E.3.1 E.3.2	2.2	T1
INFO.10	Explains how to calculate the speed and processing rate according to the cutter and other variables.	E.4.3	2.2	T1
INFO.11	Explains the points of safe approach, secession and tool changing.	E.2.2 E.2.3 G.5.1	2.2	T1
INFO.12	Explains the end of program tasks.	E.8.1 E.8.2	2.2	T1
INFO.13	Explains how to simulate in a virtual environment or how to run the machine on idle mode.	E.8.1 E.8.2	2.3	T1
INFO.14	Explains single block (line by line) operation of the program to machine the piece.	F.1.7	3.1.	T1
INFO.15	Explains how to make manual, visual and dimensional checks of the machined piece.	A.3.1	3.2.	T1
INFO.16	Explains the programming that may be required during serial production.	G.4.2	3.2.	T1

b) SKILLS AND COMPETENCIES

No.	Statement of Skills and Competencies	NOS-Related Department	Qualification Unit Success Criteria	Assessment Tools
*SC.1	Determines the order of work-task according to the work order or working drawing.	B.1.1 C.1.1	1.1	P1
SC.2	Checks the proper calibration of measurement and control tools.	B.2.2	1.1	P1
SC.3	Prepares the raw material and clamping apparatus to be used according to the work and the working drawing.	B.3.1 D.4.2	1.2	P1
*SC.4	Prepares the cutter and tool chucks to be used according to the work and the working drawing.	C.2.2 C.2.3 C.3.1	1.2	P1
*SC.5	Turns on the CNC machine (turning on the switch and other units, checking the coolant liquid, air-oil pressures, etc.).	D.1.1 D.1.2	1.3	P1
*SC.6	Attaches the chucks to the machine and adjusts as needed.	C.3.1 C.3.2	1.3	P1
*SC.7	Clamps the workpiece to the machine by using suitable tools.	D.4.1 D.4.2 D.4.3 D.4.4	1.3	P1

No.	Statement of Skills and Competencies	NOS-Related Department	Qualification Unit Success Criteria	Assessment Tools
*SC.8	Offsets the workpiece.	D.2.1 D.7.5 G.4.1	1.3	P1
*SC.9	Determines the CNC Coding method.	E.5.1 E.5.2	2.1	P1
SC.10	Enters the user coordinate system and the measurement system (metric/inches) to the program.	E.3.1 E.3.2	2.2	P1
SC.11	Calls up suitable tools and offsets on the program according to the operation order.	F.1.9	2.2	P1
SC.12	Enters the speed, process rate and depth of cut values suitable for the cutter into the program.	E.4.3 E.5.3	2.2	P1
*SC.13	Determines the tool movements in a way that eliminates the risk of the tool impacting the workpiece.	D.3.2	2.2	P1
*SC.14	Creates tool paths in accordance with the working drawing.	G.6.13	2.2	P1
SC.15	Uses the machine features depending on the operation.	F.1.4 F.2.2	2.2	P1
SC.16	Performs the end-of-program tasks.	E.2.10	2.2	P1
*SC.17	Simulates the program created or runs the machine on idle.	G.8.1 G.8.2 G.8.3	2.3	P1
SC.18	Calls the program on the machine to run in a mode that will ensure faultless operation.	F.1.3 F.1.7	3.1.	P1
SC.19	Prepares the piece ready for serial production.	G.4.3	3.2.	P1
SC.20	Turns off the machine.	E.6.6	3.3.	P1
*SC.21	Apply the OHS rules in the works they carry out.	A.1.1	4.1.	P1
*SC.22	Applies the environmental protection measures in the works carried out.	A.2.1	4.2.	P1
*SC.23	Applies the quality requirements in the works carried out.	A.3.1	4.3.	P1

(*) Critical steps that must be accomplished in the practical exam.

QUALIFICATION ANNEXES

ANNEX 1: Qualification Units

12UY0082-4/A1: Occupational Health and Safety, Environmental Safety and Quality
12UY0082-4/A2 Programming and Production in CNC Machines

ANNEX 2: Terms, Symbols, and Abbreviations

EMERGENCY: Incidents that require an emergency response, intervention, first aid or evacuation such as fire, explosion, the spread of dangerous chemical substances, a natural disaster that may occur in the whole or in a part of the workplace,

ANALYSIS: The way to reach a conclusion by separating a subject (material or intellectual) into its main parts and determining both the parts and the relationships between them,

INCREMENTAL MEASUREMENT: Reading the measurement values according to the latest point of reference,

CLAMPING MOLD (FIXTURE): The apparatus for clamping the workpiece,

SKILL: The ability to fulfill duties and responsibilities regarding a specific work,

CNC: Computerized Numerical Control.

ENVIRONMENTAL PROTECTION: Use of materials or processes that do not harm the environment, in the studies, or disposing of hazardous wastes properly,

DRAWING COMMANDS: Drawing commands used in the given computer-assisted drawing program,

FILE FORMAT: Predetermined set of features used to distinguish the files of the computer,

G AND M CODE: Movements and function code of the CNC program to be performed on the machine,

RECOVERY: Putting materials back into use and managing the relevant processes, directly or after processing them,

SAFE WORKING DISTANCE: The safety distance determined around the workpiece,

SAFETY POSITION: The safe reference point of the tools used,

MOTION CODES: CNC Program codes that provide machine movements,

PROCESSING RATE: The distance taken by the cutting tool in one full revolution of the workpiece around its axis,

ISCO: International Standard Classification of Occupations.

OHS: Occupational Health and Safety.

MACHINING POWER: The capacity to remove metal from surfaces of metal parts through various methods by use of cutting tools.

MACHINING SPEED LIMITS: Speed limits that must be followed while machining the workpiece,

MACHINING DIRECTION: The direction of the movement of the cutting tip on the surface of the workpiece.

TOOL CHUCK: The tool holder of the turning lathe,

CUTTING LIQUID: The liquid used in machining tasks to reduce possible high temperatures created by friction between the workpiece and cutting tools to reasonable values,

PERSONAL PROTECTIVE EQUIPMENT(PPE): All tools, equipment, instruments, and devices that are either dressed, worn, or held to protect the workers against one or multiple risks which may arise during work or which may affect their health and safety,

COMMAND: The smallest traceable element that consists of any of the basic tasks a computer can perform.

CONTROL PANEL: The section containing the keys such as program writing, manually moving the cutter in the axes, program starting, stopping, manually selecting the tool, and the program writing screen,

MENU: List of commands or options,

OFFSET PAGE: The section where the cutting tool information and the workpiece are defined on the control panel of CNC machines,

OPERATION: The machining tasks applied to shape the part,

DIMENSIONING: The task of writing the required dimensions on the piece or on the image of the piece according to certain rules,

PACKAGE SOFTWARE: Computer programs that are prepared for any purpose and can be used without the need for computer expertise,

PROGRAM CODES: Codes used to program the CNC machines,

RADIUS: Radius

REFERENCE: A point or object the location of which is used as constant,

SENDING TO REFERENCE: Sending the machine axes to the zero point at specified coordinate,

RISK ASSESSMENT: Necessary works to detect the internal and external risks at work, to analyze and rank the factors that cause these hazards to turn into risks and the risks caused by hazards, and to determine the control measures.

RISK: Composition of the probability of occurrence of a dangerous incident and its consequences.

OFFSETTING: To determine the reference position of the workpiece,

SIMULATION: Recreating a real situation with the help of a computer program (in a virtual environment) by taking all its variables into account,

TOOL CODES: Codes used in tool related tasks in CNC machines,

TOOL OFFSET: Entering the tool lengths on the offset page according to the determined offset point,

TOOL COMPENSATION: Entering the length, diameter and tooltip radius values of the cutting tools to the control panel,

TOOL PATH: The paths followed by the tool on the piece in the process of machining,

TOOL: Cutters used to remove metal from the workpiece,

CUTTING DEPTH: The thickness of the material removed from the workpiece,

CHIP BREAKING: Breaking of the longer chips of the workpiece on the cutting tool in a specified geometry,

HAZARD: Internal or external potential for harm or damage at the workplace that may affect the employee or the workplace,

TOLERANCE: The difference between the largest and the smallest acceptable dimensions,

HOLDER: Elements that are used to attach cutters to the workbench, such as milling cutters, drills, taps

ANNEX 3: Horizontal and Vertical Progression Paths in the Profession

- Vertical Progression: CNC Programmer (Level 5)

ANNEX 4: Evaluator Criteria

The evaluator must meet at least one of the following criteria.

- Having graduated from the Machinery and Metalworks Education departments of Technical Education Faculties and having at least three (3) years of occupational experience in the field of CNC programming,
- Having graduated from any of the Mechanical, Mechatronic, Production and Manufacturing Engineering departments of Engineering and Technology Faculties, and having at least three (3) years of occupational experience in the field of CNC programming,
- Having graduated from machinery associate degree programs and having at least five (5) years of occupational experience in CNC programming,
- Having graduated from the Mechanical Department of Vocational High Schools or having a mastery certificate and having at least five (5) years of occupational experience in the field of CNC programming,
- Having a CNC Programmer Level 5 VQA vocational qualification certificate and having at least five (5) years of occupational experience in the field of CNC programming.

Evaluators who possess the above-mentioned characteristics and who will participate in the assessment and evaluation process should be trained in vocational qualification system, relevant national qualification(s), relevant national occupational standard(s), assessment and evaluation and quality assurance and OHS in assessment and evaluation by institutions authorized in the relevant field.