OCCUPATIONAL STANDARD AND EDUCATIONAL PROGRAMME – PROCESSOR OF METALS/TOOLMAKER

Occupational standards are the basic documents for the performance of examinations and the verification of professional qualifications.

It is important for them to be clearly, intelligibly and unambiguously written in order to prevent different or wrong interpretations. Therefore, the methodology for the preparation of occupational standards is prescribed, which ensures the transparency and comparability of occupational standards.

Occupational standards are prepared for individual professions which are recognised by the Statistical Office of the Republic of Slovenia and classified into the Standard Classifications of Occupations. It is important that occupational standards are prepared in cooperation with experts who are familiar with the profession, work organisation, technology and, last but not least, trends in the development of the profession and the sector itself.

Although the occupational standards are closely related to a particular sector and profession, general competences necessary to work effectively in a profession should also be included. For example: quality assurance of work, ICT skills, communication skills, work planning and organisation, health and environmental protection, etc. Unfortunately, this means that at the moment the national professional qualifications system is not able to verify general competences, which, on the other hand, undoubtedly increase the horizontal as well as vertical mobility.

The preparation of occupational standards is done through social dialogue. It is important for the employers to explain what kind of personnel with what kind of knowledge and skills they need now and in future. After all, occupational standards are not just a record of the current situation but also of the trends in the development, which is of considerable importance for the changing labour market not just from the point of view of the employer but especially from the point of view of the certificate holder.

The procedure for the preparation of occupational standards and catalogues of standards for technical knowledge and skills is determined in the Rules on the Standard Classification of Occupations:

- The procedure begins with an **initiative** submitted on a specific form to the National Institute for Vocational Education and Training, which records it, provides an expert assessment and submits it for discussion to the sector committee for

occupational standards. When discussing the initiative, information on the needs of the labour market, on the comparability of standards for a specific qualification among EU member states, and, if necessary, on compliance with regulations and norms at EU level are especially important.

- If the sector committee for occupational standards considers the initiative to be well-founded, experts proposed by the competent sector committee for occupational standards, with methodological support from the CPI, prepare a proposal for an **occupational profile**.

- Based on the occupational profile, experts proposed by the competent sector committee for occupational standards, with support from the CPI, prepare a proposal for an **occupational standard** which defines professional competences, knowledge and skills necessary for a particular profession or set of responsibilities. The occupational standard is coordinated within the competent sector committee for occupational standards, which proposes it for discussion to the Council of Experts of the Republic of Slovenia for Vocational and Technical Education. An expert committee for occupational standards operating within the Council of Experts of the Republic of Slovenia for Vocational and Technical Education discusses the occupational standard and proposes its adoption or rejection. The final decision is taken by the Council of Experts of the Republic of Slovenia for Vocational and Technical Education, which thereupon proposes the occupational standard for adoption and publication on National Reference Point (www.nrpslo.org) to the minister responsible for labour.

- The occupational standard must be compiled in accordance with the **methodology** determined by the competent expert council on a proposal from sector committees for occupational standards. The national methodology represents a uniform basis for all occupational standards and catalogues, and thus ensures transparency and comparability of documents at national level. The methodological support for the preparation of occupational standards and catalogues is provided by the National Institute for Vocational Education and Training.

- On the basis of the occupational standard, a working group prepares a proposal for a **catalogue of standards for technical knowledge and skills** which is finally coordinated by the sector committee for occupational standards. Once the coordination is completed, the sector committee proposes the catalogue for discussion to the Council of Experts of the Republic of Slovenia for Vocational and Technical Education. The expert committee for occupational standards and the commission for educational programmes, operating within the Council of Experts,

propose to the Council the adoption or rejection of the catalogue, and thereupon the Council proposes it for adoption to the Minister of Labour, Family and Social Affairs.

- **On the basis of one or more occupational standards a VET programme is developed**. The national standards (minimum of hours for general knowledge modules and for professional modules, proportion of open curricula, etc) for each level of VET programmes are set by the Council of Experts of the Republic of Slovenia for Vocational and Technical Education. Each new VET programme is discussed by the Council of Experts of the Republic of Slovenia for Vocational and Technical Education which finally proposes to the adoption or rejection of the VET programme to the Minister of Education and Sports .

Presentation of occupational standard from the sectors of metal-working and its transformation into VET programme

Below we present our process of development from occupational standard to VET programme. We will present this process on one case of Tool industry worker (occupational standard) how it translates into the VET programme.

OCCUPATIONAL STANDARD

(http://www.nrpslo.org/ris/preview.aspx/52100160)

NAME AND CODE OF THE OCCUPATIONAL STANDARD**: Tool industry worker** –
KLASIUS – P CLASSIFICATION SYSTEM (Slovene classification system): **Technical occupation**
NAME AND CODE OF THE OCCUPATION**: Tool industry worker**
LEVEL OF DIFFICULTY/EXEPRTISE: **level 4 NQF Slovenia, possible level 3 EQF (still in consultation)**

PROFESSIONAL COMPETENCES
Candidates:

1. plan, implement and control their own work
2. prepare own posts and work tools
3. rationally use energy, material and time
4. perform work so as not to endanger yourself, the people and the environment
5. communicate with colleagues, with clients and customers
6. use computer equipment and software tools
7. manage working medium in the production
8. manufacture tools
9. control and coordinate the work process of their own work
10. test the tools and are involved in the transfer of tools to buyer

OCCUPATIONAL STANDARD AND EDUCATIONAL PROGRAMME – PROCESSOR OF METALS/TOOLMAKER

DESCRIPTION OF THE EDUCATIONAL STANDARD

Field of work	Core tasks	Professional skills and knowledge
Analysis, planning and organization of work	Plans and organises own work	• examines project-workshop documentation, technical and technological documentation • prepares the work plan • plans the necessary tools and devices in accordance with the documentation • plans the preparation and usage of resources to work in accordance with the documentation and other requirements • masters technical drawing • can read the technical documentation • understands mechanical drawing elements, subassemblies and assemblies tools • is familiar with the organization of the working environment • has knowledge of descriptive geometry in the profession • masters working order and knows the standards of material consumption • has knowledge of tools and equipment to carry out specific tasks • Knows the principles of work tasks organization
Preparation of own work or work post	Prepares own post and tools	• takes and examines the work order • reviews the sample drawing of the product and inventory of the machining process from technological sheet and estimates the scope of work • checks the supporting documents with technological sheet • reviews the work and protective equipment • takes delivery of the material and controls the quantity and quality

Field of work	Core tasks	Professional skills and knowledge
		• takes delivery of the tools and prepare them and materials, equipment for the manufacturing of tools • reviews the quality of tools and takes measures in case of damage • takes delivery of scaled rulers and tools • understands the importance of tolerance and matching • knows the basic and auxiliary materials and their properties, usability and compatibility • Is familiar with working tools, appliances and machines and their usefulness • knows the work instructions for work equipment and facilities for safe work
Operational work	operates machines in the production	• conducts a review of machinery and equipment • prepares and calibrates tools • mounts and dismounts work pieces • adjusts tools in accordance with the instructions • cleans the machine, the workplace and the work piece • uses hand tools for working • knows different types of machine tools and other working assets • knows how to operate metal working machinery, tools and accessories • is familiar with methods of clamping and fastening elements or tools. cutting tools and accessories • knows and is able to realize the basic parameters of the maintenance of labour resources
	Works on assembling the tools	• systematically assembles parts of the sub-assemblies and tools • according to the plan sets the elements of the tools' control functions • assembles and adjusts parts of the

Field of work	Core tasks	Professional skills and knowledge
		tools in the functional unit • prepares the designed surface of the tool parts • finalizes the active surface of the tool • applies varnish to inactive tools' surfaces • adjusts operating pressure of the tools' gas springs • finalizes the tools' composition • understands the function and operation of the tools • knows how to use the auxiliary equipment (manipulators, positioners, ...) • knows the methods of assembly of tools' elements in accordance with the instructions, and knows how to check the matching and the active tools' surfaces • knows the methods of installation of standard elements and methods of adjusting simple tools' control elements
	controls and coordinates the work process of their own work	• participates in the manufacture of individual parts of the tool • takes delivery of standard elements • control the dimensional and functional relevance of manufactured parts and assemblies according to the technical documentation • performs self-control of own work • diagnoses errors and notes inconsistencies • is able to work in a group • knows the role, function and arrangement of the tools' standard elements • is able to perform basic measurements of elements • is able to interpret the results of control measurements and implement corrections on the tools

Field of work	Core tasks	Professional skills and knowledge
		using machines and other devices
	tests the tools and is involved in the transfer of tools to buyer	• prepares the tool for testing • tests the tool on the accuracy of the product, ensuring stability in the manufacturing process • checks the overall functioning of the tools • makes final work on the tool taking into account the measurement protocols of the product • tests the tool at the buyer's premises • addresses deficiencies and inaccuracies in measurement • advises clients in respect of operation, use, setup and maintenance of the tools • has knowledge of machines and devices for testing tools • Knows how to prepare a tool for testing • Knows communication techniques for dealing with clients
Administration	Manages the required documentation	• manages the technical, technological, storing and working papers • prepares reports on completed work • enters the data on delays, malfunctions and other events on the machinery and equipment • knows the necessary work records • knows the elements of the working and technological documentation • masters the use of computers and other office equipment
quality assurance	Performs own work in accordance with standards and regulations	• assures quality in accordance with the standards • controls and evaluates the results of their own work • controls and monitors production; • control devices and takes measures

Field of work	Core tasks	Professional skills and knowledge
		in case of injury • rationally uses energy, material and time • uses measurement devices (scale, measuring tools, control devices) • participates in making proposals for improvements in machinery and improvements in the production process • monitors development trends in technologies and materials • has knowledge of procedures for identifying and monitoring quality of service • knows the standards and methods of quality control for materials and products • knows applicable standards and regulations • knows the types and methods of managing of individual records for quality assurance • is aware of the importance of rational use of materials and energy • masters the technical procedures and work instructions • knows the work instructions for work equipment and facilities for safe work
Maintenance	maintains a neat and clean working environment	• carries out daily cleaning, easy maintenance and repair of the equipment and tools • maintains machines, equipment and space between work • controls devices and takes measures in case of injury, and notify the superiors • participates in the maintenance work • understands the mechanics and the importance of maintenance • knows the procedures for regular inspections and maintenance of equipment, machinery, appliances

Field of work	Core tasks	Professional skills and knowledge
		and tools • knows preventive and corrective maintenance and the importance of maintenance • knows the basic maintenance of the devices, equipment and gear
communication	Collects and disseminates work related information	• collects and disseminates information on the work process and the status of tools and equipment • communicates with superiors, with technologists, service quality and other staff for quality, safe and environmentally sound work • participates in group • communicates with customer representative • Is familiar with professional terminology and uses it • Has basic knowledge of Business Communication • Has knowledge of technical terminology
Health and environment protection	performs work so as not to endanger yourself, the people and the environment	• complies with the rules on safety and health at work and the Fire Protection • applies personal and collective protective equipment • uses protective equipment and safeguards to work • protects own health, the health of all present and the environment • informs the head of the irregularities that hinder the health and safety at work • collects, classifies and properly disposes of waste material • knows the rules on health and safety at work regulations on fire protection, fire order and command of protective measures • knows the rules for protecting the environment • knows possible injury at work • masters the basics of first aid

OCCUPATIONAL STANDARD AND EDUCATIONAL PROGRAMME – PROCESSOR OF METALS/TOOLMAKER

Field of work	Core tasks	Professional skills and knowledge
		• knows the importance of using personal protective equipment • knows the rules and masters the steps to protect the environment

Each VET programme is **based on** **one or more occupational standards** and enables the students to gain a broader educational qualification which leads to employment in more than one occupation. In case of Tool industry worker, this standard is a part of a 4 year vocational programme which is based on 2 occupational standards: Tool industry worker and Metalworking machinery operator.

Each Vet programme consists of a **Part A - General education** and **Part B + C** Professional **technical education.** In this last one we have obligatory and selective modules. In this VET programme called Processing of metal and tool making we have 11professional modules of which 7 are obligatory and 4 elective.

SECONDARY EDUCATIONAL PROGRAMMES

SECONDARY VOCATIONAL EDUCATION

http://portal.mss.edus.si/msswww/programi2011/programi/SPI/index.htm
- all educational programmes -

TYPE OF EDUCATION: SECONDARY VOCATIONAL EDUCATION
TYPE OF EDUCATIONAL PROGRAMME: VOCATIONAL EDUCATION AND TRAINING
PROGRAMME: PROCESSING OF METALS AND TOOL MAKING
http://portal.mss.edus.si/msswww/programi2011/programi/SPI/oblikovalec_kovin_orodjar/kazalo.htm

CONTENTS

A) GENERAL PART

1) EDUCATIONAL PROGRAMME

1.1) Name of the educational programme: **Processing of metals – tool making**

1.2) Title of vocational education: **Processor of metals – tool maker**

2) OBJECTIVES OF THE EDUCATIONAL PROGRAMME

Alongside general objectives of education, this educational programme enables secondary school students to:

- develop skills for critical thinking and responsible conduct in their work environment, humanity and honesty as well skills needed for teamwork

- be able to mathematically solve technical problems related to their field of work/occupation;
- be able to understand analytical and graphical displays of data in statistics
- master basic informational-communicational technologies so that they are able to independently use computer programmes (Word, Excel, programmes needed for machine operation/control, diagnostic machine operation/control, programmes needed for production/work management)
- learn about the fundamentals of business, cost management and different calculations
- master the skills needed for safe and correct use of work-related resources and personal protection equipment; learn about the rules and regulations related to workplace safety as well as measures undertaken to prevent workplace accidents (material damage or bodily harm/psychological trauma)
- master methods and procedures needed for rationalization of energy/materials/time consumption
- learn about recycling procedures
- master and understand basic principles (laws) of engineering
- plan and prepare work process, control the process and evaluate work results
- know how to use and make simple technical drawings of different components, subassemblies and other tools which are in accordance with standardization
- master different manual and mechanical procedures needed for cutting, (re)shaping and fusing of metals and non-metals
- have knowledge of composition, properties and use of materials
- master the techniques and technologies specific to their occupation/profession
- have extensive knowledge of measurement and control procedures as well as the use of measuring devices or tools
- have knowledge of legal procedures relevant to their professional field of work – procedures pertaining to handling, storing and removal of environmentally damaging/unsustainable substances
- learn about measures and procedures needed for minimizing the damage to the environment
- master the principles of workplace safety; during practical work they comply with safety regulation, develop ecological consciousness and rationalize energy consumption

- familiarize themselves with regulations and laws regulating workplace safety and measures undertaken to ensure prevention of work-related accidents and injuries
- provide basic level lay first aid (when injury occurs)
- have the necessary knowledge to connect content from different professional areas (interdisciplinary approach)
- be independent, persistent and creative in their profession
- be able to adapt to teamwork environment
- to learn to use different study literature related to their area of work

At the end of the educational programme, the student shall:

- be a tolerant, humane and responsible individual, able to work in a team and live and participate as an individual in a diverse/heterogeneous democratic society
- look forward to participating in lifelong learning programmes
- be capable of manufacturing a metal construction in accordance with technical and technological documentation
- be able to transport parts of a construction or a complete construction, assemble and install the construction as well as protect the construction against corrosion
- able to control his or her work, either visually and or checking the measurements, in case of potential damage to the construction or repair needed, the individual shall be able to choose the correct materials and technology required for repair while taking into account workplace safety rules and environment protection regulations
- upgrade his or her general education and develop key competences for a) a successful participation in society, b) personal development, c) further education in accordance with national standards of key qualifications

3) DURATION OF EDUCATION

- Educational programme lasts for **three years.**
- For a successful completion of the educational programme the student is awarded **180 credit points.**

4) ENROLMENT CONDITIONS/REQUIREMENTS

Anyone who has successfully finished:

a) primary school education
b) lower vocational education or any equivalent education acquired according to previous regulations

can enrol into this educational programme.

5) METHODS OF OBLIGATORY ASSESSMENT AND EVALUATION (EXAMINATION TYPES)

Code	General education subjects and professional modules	Oral exam	Written exam	Product or service	Other
P1	Slovene language	X	X		
P2	Mathematics	X	X		
P3	Foreign language	X	X		
P4	Art			X	
P5	Social sciences	X			
P6	Natural sciences	X			
P7	Physical Education				Practical tasks
M1	Technical communication related to occupation			X	
M2	Materials and processing of materials related to occupation			X	
M3	Construction elements			X	
M4	Organization and Business			X	
M5	The fundamentals of processing materials			X	
M6	CNC machine programming			X	
M7	Machine and device automatisation			X	
M8	Materials design			X	
M9	Special types of processing			X	
M10	Tools and preparations for mass production			X	
M11	Tool assembly and testing			X	

P – stands for SUBJECT (in Slovene 'PREDMET')
M – stands for MODULE

6) CONDITIONS FOR ADVANCEMENT AND COMPLETION OF EDUCATION

6.1) Advancement conditions

A student is allowed to enrol in a higher level of education (higher grade) if he or she has been given a positive/passing mark for all the general subjects and professional modules in the curriculum, and after they have fulfilled all the obligations found in the content of the extracurricular activities. They must also fulfil all the requirements of the practical work training. They are also allowed to enrol into a higher level if the teaching staff agrees to it (decisions are made for each individual).

Students with individual learning contract are allowed advance from second to third grade when they pass a so-called interim examination.

6.2) Conditions for completion

To conclude the educational programme and to acquire profession education/qualification, the student must successfully complete (receive a passing mark for) the following:

- general education subjects
- obligatory professional modules
- elective professional modules
- open part of the curriculum

The student must also pass:

- all the extracurricular activities set by the educational programme
- responsibilities set in the practical work part of the programme
- final exam

The final exam consists of:

- written and oral exam in Slovene
- a product or service and defence

7) NATIONAL VOCATIONAL QUALIFICATIONS

This educational programme does not enable a student to acquire National Vocational Qualifications.

OCCUPATIONAL STANDARD AND EDUCATIONAL PROGRAMME – PROCESSOR OF METALS/TOOLMAKER

B) PROFESSION-SPECIFIC PART

a) Skills and knowledge catalogues and Examination catalogues for general education subjects/courses

General education subjects are listed on page 15 of this report in the chart METHODS OF OBLIGATORY ASSESSMENT AND EVALUATION (EXAMINATION TYPES).

b) Skills and knowledge catalogues and professional/occupational modules

There are **11 modules** in this programme:

1) Technical communication related to occupation
2) Materials and processing of materials related to occupation
3) Construction elements
4) Organization and Business
5) **The fundamentals of processing materials**
6) CNC machine programming
7) Machine and device automatisation
8) Materials design
9) Special types of processing
10) **Tools and preparations for mass production**
11) Tool assembly and testing

To show how competences from occupational standard are transferred into a module we will use **two modules** (5,10) from the programme.

EXAMPLARY MODULES

MODULE 5: FUNDAMENTALS OF PROCESSING MATERIALS

This module covers some of competences from occupational standard and those are:

Orientational/guiding objectives:

The student:

1) discerns the type of processing technology from the workshop documentation
2) is familiar with and oversees the operation of materials processing machinery
3) knows the basic principles of different processing procedures
4) chooses the correct processing machinery for different types of processing procedures
5) chooses suitable cutting tools and equipment for specific processing machinery
6) knows how to use means of control and measurement, checks the quality of products, makes notes of the results
7) understands environmental issues/problems and continuously develops a more and more responsible relationship towards the environment and nature; understands the importance of preserving the diversity of live
8) broadens knowledge on sustainability and the use of renewable natural resources
9) explores physical and chemical properties of certain substances/materials and their process of transformation
10) recognizes the workplace dangers, follows work safety procedures and uses safety equipment
11) Understands the importance of his role in the organized production process

Professional competences:

1) Use technical and technological documentation and appropriate technical terminology
2) Differentiates the materials to make tools, to identify tools, to carry out the order of tools
3) Produce simple machine parts using various methods of machining
4) Evaluate and actively participate in ensuring a healthy and safe work
5) Working in groups, communicate with colleagues and superiors

OCCUPATIONAL STANDARD AND EDUCATIONAL PROGRAMME – PROCESSOR OF METALS/TOOLMAKER

Informational objectives /knowledge	Formational objectives/ skills
Student: • understands the basic principles of cutting • Is familiar with different manufacturing processes and their usefulness • understands the nature of drives and machine kinematics • understands guide, spindle, sled, compensatory Skirts • has knowledge of gear and continuously variable transmissions for setting trends in the machine • knows the effect of heat on the tool and work piece process • understands the configuration parameters of the process and resources necessary information and the method of determining the parameters • has knowledge of the geometry of the cutting wedge and their dependence on the type of material to be treated • understands the special devices to work on machine tools • understands the periodic inspection and preventive maintenance of machinery	Student: • differentiates machining possibilities of different materials • differentiates and uses hand tools and machines • identifies and describes the basic functions of the machines • names component parts of the machine tool and its purpose • defines the parameters the connection between them and the impact on processing • calculates the speed of machining processes • explains the movement of the machine tool • interprets and applies instructions to monitor the work process • checks the machine before starting, and control during operation • carries out detailed settings and prepare the machine to run • adjusts the machine speed and feed rate • applies clamping and clamping devices on the machine • prepares a coolant and knows the rules of cooling and lubrication • controls the situation or fluid levels (oil, coolant) • determines tool wear and time to change the tools • prepares and implements a measurement with movable criteria micrometer and dial gauges • separates divisions on a graduated scale and uses the scale properly • identifies the dead travel to the spindle and the proper way • Is able to choose the right kind of support and prepare the work piece for clamping • sharpens tools (drill, turning the knife) • is able to choose the appropriate tool for a specific material.

MODULE 10: TOOLS AND PREPARATIONS FOR MASS PRODUCTION

Orientational/guiding objectives:

The student:

1) is familiar with different types and usages of different machinery, tools and devices used in the craft of tool-making
2) is familiar with different techniques used for the processes of reshaping, paring or cutting and combining metal material
3) is familiar with heat treatment processes of metal materials
4) uses technical documentation and standards in his professional area
5) develops a conscientious attitude towards economical use of materials and energy sources
6) knows the importance of correct procedure of fastening the materials (to be processed) with regard to the technological procedure used and the type of work to be done
7) is familiar with the tools used in mass production
8) understands how different tools operate and is able to manufacture their component parts
9) understands and recognizes workplace dangers, follows the instructions for safe work and uses protection equipment
10) understands the importance of his own work in the organized production process

Professional (core) competences:

1) To be familiar with and understand technical documentation and standards
2) To organize and prepare the work area, the machinery and the tools for safe and professionally carried out work
3) To choose the technological procedure and to set the proper parameters for machine operation
4) To determine the sequence of processing or manufacture procedures
5) To manufacture different tool components
6) To evaluate and actively participate in the process of ensuring healthy and safe work environment
7) To work in a team, communicate with co-workers and superiors

OCCUPATIONAL STANDARD AND EDUCATIONAL PROGRAMME – PROCESSOR OF METALS/TOOLMAKER

Informational objectives /knowledge	Formational objectives/ skills
Student: • learns about technical, technological and work documentation • learns how to do measurements with the different measuring tools (angles, bubble/spirit levels, comparators, etc.) • learns about drilling, manual tapping, broaching, etc. • learns about mechanical sawing (to cut the materials) • learns how to operate the CNC lathe, milling machine and grinding machine in order to perform less demanding tasks • learns about coordinate drilling machines • learns how to prepare materials for welding, carry out different procedures of welding (gas flame, electric arc, etc.) • learns about heat treatment of tools and knows how to measure hardness • is familiar with erosion processes in treatment of metals • knows how to carry out the polishing procedure • learns about the cutting tools, bending tools, folding tools, combined tools, forging tools, extrusion tools, tools for spraying/sputtering plastics and coloured metals • learns about simple work plans, assembly lines and cells • becomes familiar with all the prescribed measures and standards found in the workplace safety plan • becomes familiar with different ways of protecting the environment • knows the importance of accuracy and consistency of work	Student: • knows how to plan, set up and ensure suitable execution of his own work while paying regard to work order, work (technical) instructions as well as organizational and informational references • uses miscellaneous hand tools, machinery and devices • checks or sets parameters on the machines, devices, different aids and tools in accordance with the standards or technical specifications provided by the manufacturers • follows work instructions • sets (technological) parameters and performs the procedure of electro-erosion (of metals) • masters various procedures of joining materials – knows their characteristics/features • masters various procedures of heat treatment • knows how to perform polishing procedure • develops a sense of precision, creativity and persistency (needed for work) • ensures quality and searches for rational solutions • knows how to work in a team and consult with other members when solving a problem • accepts responsibility for technical thinking and creativity • masters professionalism, develops precision, reliability and responsibility for the work done • recognizes factors harmful to the environment and dangers to which workers are exposed to at their workplace (with regard to specific profession) • takes into account laws and regulations relating to workplace safety and health and other legal acts that relate to ensuring a safe and healty work area • uses protective equipment

EXAMINATION CATALOGUE

PROCESSOR OF METALS-TOOL MAKER

(the layout)

1) NAME OF THE EDUCATIONAL PROGRAMME

Processor of metals-tool maker

2) TYPE OF EXAM

Product /service and defence

3) EXAMINATION OBJECTIVES

General and professional competences are checked – these combine the objectives of professional theoretical knowledge, practical training and key competences.

During the examination the student must prove he or she has the following professional and key competences (listed are only a few):

- connects practical and theoretical knowledge
- understands and knows how to use technical regulations and standard when preparing technical documentation
- understands technical instructions, is able to prepare work report
- plans, oversees and supplements workshop documentation
- prepares and is able to read/understand technical drawings and other technical documentation
- prepares simple technical documentation with the help of software
- works in a group, communicates with team members and superiors
- actively participates in the assurance of safe and healthy work environment
- communicates by using technical terminology related to the area of informational-communicational technologies
- designes, prepares and archives basic documentation according to instructions
- searches for data on the Internet and communicates by using e-mail
- knows the difference between metals and non-metals, correctly chooses materials and treatment procedures with regards to the demand/expected product

4) EXAMINATION PROCEDURE

Students show their theoretical and practical knowledge acquired during the educational process. The procedure proves the students are qualified for their profession/occupation.

5) PROFESSIONAL COMPETENCES TO BE PROVEN

Only the first few lines for each of the three columns have been given in order to show examples. If needed, we could provide the entire translation.

PRODUCT/ SERVICE	ELEMENTS	PROFESSIONAL COMPETENCES
Manufacture of screw thread shaft	• Choose machinery and tools • Prepare machinery and tools for operation • Choose correct sequence of operation • Choose and prepare materials, place/mount the workpiece (to be processed)	• Preparation and reading of technical drawing and other technical/technological documentation (reading technical terminology) • Knowing the procedures of treatment and technical features of machinery, tools and devices • Understanding and the use of technical standards
Manufacture of a component on the milling machine		
Grinding of an element of a cutting tool		

6) ASSESSMENT AND EVALUATION

6.1 ASSESSMENT AND EVALUATION CRITERIA

AREA OF ASSESSMENT AND EVALUATION	CRITERIA OF ASSESSMENT AND EVALUATION	NUMBER OF POINTS
1 PLANNING	• Prepare work area • Choose tools and aids • Set treatment parameters • Prepare/establish technological documentation	**10-15**
2 EXECUTION	• Choose the correct sequence of operations • Choose the correct tools and parameters • Achieve suitable precision/accuracy • Suitable quality of surface	**60**
3 DOCUMENTATION	• Report on completed work/tasks	**10-15**
4 DEFENCE	• Presentation of the completed work/tasks and argumentation/reasoning • Professional discussion	**10-20**

6.2 CONVERSION OF POINTS INTO A MARK

NUMERICAL MARK	NUMBER OF POINTS
Excellent (5)	88-100
Very good (4)	75-87
Good (3)	63-74
Minimum needed to pass (2)	50-62

7) EXAMPLE OF AN EXAMINATION

a) *Title*: **Manufacture of a simple product on the CNC machine**

b) *Elements*:

- Setting the objective
- Planning
- Execution
- Argumentation

c) Description:

- Read workshop drawings to the element to be produced
- Prepare and calibrate cutting tools
- Make operational sheet
- Make tool sheet
- Make a sketch, show positioning and mounting/fastening
- Make a cutting plan
- Make a programme for the CNC machine
- Transfer the programme to the CNC machine
- Plot the origin and the zero point
- Make the first piece
- Correct the tools (if necessary)
- Check the work done
- Prepare technical report
- Ensure the safety of people and protect the environment
- Remove the waste ecologically
- Provide argumentation and defend your work

d) Professional competences the student must exhibit/prove:

- connect practical and theoretical knowledge
- understand and know how to use technical regulations and standards when preparing technical documentation
- make and know how to read workshop drawings and other technical documentation

- be familiar with the applicability of different procedures of manual and mechanical cutting
- be familiar with the applicability of different procedures and technical features of machinery, tools and devices
- know how to use of catalogues of elements, products, and semi-manufactured products and other professional literature
- set the work place , tools and devices
- be familiar with various methods and preparations for optimal fastening/mounting of workpieces (to be processed)
- correct use of tools, machinery and devices
- change the tools, workpieces and set (technological) parameters.
- rationally use materials and energy sources
- proper choice and usage of technical measuring means in order to check precision and quality of the product
- be familiar with and use basic principles of ethics and communication
- be familiar with and know how to use technical terminology
- plan and organize own work
- be familiar with and know how to use basic principles of workplace safety , personal protection and environmental protection
- use of standard computerized mechanical equipment and software
- be familiar with CNC machine operation
- ensure quality of product or service
- make calculations and prepare a balance sheet for cost, order materials
- check functionality of the product, correction of mistakes/flaws

e) Defence

- present the manufacture procedure
- provide argumentation for the use of tools and procedures from the professional viewpoint and from the viewpoint of health and environment protection

f) Assessment and evaluation

AREA OF ASSESSMENT AND EVALLUATION	HIGHEST NUMBER OF POINTS ACHIEVABLE	POINTS ACHIEVED
PLANNING	**10**	
Reading, understanding of technical documentation	3	
Preparing work plan	4	
Recognizing, choosing and preparing the materials	4	
EXECUTION	**60**	
Correct procedures during the execution of work	2	
Using correct tools for individual tasks	3	
Quality of products/executed work	30	
Proper use of measuring devices	2	
Properly establishing diagnosis after completed measurements	5	
Time of manufacture	2	
Tidiness of workplace	2	
Use of protection equipment	5	
Taking into account workplace safety and health	5	
Protection of environment, rational use of energy sources	2	
Business entrepreneurship	2	
DOCUMENTATION MANAGEMENT	**25**	
Fulfilment of work order	2	
Results of measurements	1	
Report	2	
PROFESSIONAL DEFENCE	**25**	
Product presentation	10	
Defence	15	
TOTAL NUMBER OF POINTS	**100**	