

**Ministry of Education and Science of the Republic of Kazakhstan
Non-commercial Joint Stock Company “Holding “Kasipkor”**

EDUCATIONAL PROGRAM

specialty **1414000 “Furniture manufacturing (by types)”**

Qualifications

**Assembler of wood products
Master of carpentry and furniture production
Technician-technologist
Junior production engineer**

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Non-commercial Joint Stock Company “Holding “Kasipkor”

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ALE “Association of furniture and timber manufacturing undertakings of the Republic of Kazakhstan”

Academic methodical association of “Furniture production” on the basis of Construction and Technical College, Almaty

ENTERED by Non-commercial Joint Stock Company “Holding “Kasipkor”

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1. Program description

This educational program is based on modular-competence approach in accordance with modern international requirements for midranking specialists and skilled labor force, with the participation of foreign partner - German Society for International Cooperation (Dreberis).

Educational program based on competencies, is designed with the concept of lifelong learning, as the content of the educational programs is directed to the formation of highly qualified experts, able to adapt to the changing situation in the world of work, on the one hand, and to continue their professional development and education - on the other. This approach to learning allows to create a feeling of success of each student, which is created by the Organization of educational process in which the learner can and should control its own training, that teaches them to take responsibility for their own learning, and further - for their own professional growth and career. Thus, the trainee, as a consumer, will be satisfied with education, he can improve it during life, responding to changes in the labor market. The educational program by the specialty provides information on the relevant qualifications, professional profiles, education plan, requirements for applicants and realization of professional education. Educational program on specialty "Furniture manufacturing" has been developed taking into account the main provisions:

- 1) **State classifier of the Republic of Kazakhstan** - international system of qualifications and coding of technical, economic and social information; approved and put into effect by the Committee for Standardization, metrology and certification of the Republic of Kazakhstan dated October 16, 1999, no. 22;
- 2) **State Compulsory Standard of technical and professional education** - requirements to education content, the maximum amount of training load and the level of preparation of specialists on specialty;
- 3) **professional standard** - a standard that defines in a specific area of professional activity the requirements to the level of qualification and competence, to the content, quality and conditions of work;
- 4) **National Qualifications framework** - structured description of skill levels, recognized in the labor market;
- 5) **sectoral qualifications framework** - structured description of skill levels, recognized in the industry;
- 6) **educational activity** - process of targeted, pedagogically sound, coherent interaction of education entities during which the tasks of education, personality development and education are solved;
- 7) **technical and professional education** - education aimed at preparing skilled workers and mid-level professionals;
- 8) **curriculum model** - curriculum submission form, highlighting the main structural invariant components of contents of technical and vocational education;
- 9) **educational program** - instrument prepared on the basis of State Compulsory Educational Standard, which defines the content of training of technical and service skills personnel;
- 10) **integrated educational curriculum** educational curriculum tailored to the continuity and succession of levels and educational content;

11) **model education plan** is the document establishing the list and amount of academic disciplines, their study and forms of control in relation to occupations and professions, qualifications, terms of learning in organizations of technical and vocational education;

12) **model education program** is the document that defines the nature and scope of knowledge, skills and abilities to be developed of a particular discipline (module) of the model education program;

13) **professional practice** - type of training activities aimed at consolidating the theoretical knowledge, skills, acquisition and development of skills and competences in the process of performing certain types of work related to future professional activity;

14) **working education plan** is a document developed by the Organization of technical and vocational education on the basis of the model education plan, regulating the list and volume of subjects (modules), consistency, intensity and basic forms of training, monitoring knowledge and skills of students, approved by the head of the Organization of education;

15) **working education program** is a document developed by the Organization of technical and vocational education to a specific discipline (module) based on the model curriculum, approved by the head of the Organization of education;

16) **credit technology of education** - education based on choice and independent planning by students of subjects sequence (modules) with the use of credit as a unified unit of measurement of the volume of student and teacher training;

17) **dual education** is a form of training that combines training in educational institutions with obligatory periods of training and practice in an enterprise with the provision of jobs and the compensation payment to students with equal responsibility of the enterprise, institution and the learner;

18) **qualification** - the level of preparedness of the competent implementation of certain activities in their specialty;

19) **qualification level** - type of activity, which depends on the complexity and volume of tasks and responsibilities;

20) **qualification specialization** - skill specialization required a specific area of knowledge, used in the operation with machines, tools and materials, as well as types of the goods and services;

21) **criterion of qualification** - level of education (training) and (or) experience (seniority) of practical work, which together form the necessary prerequisites for the job of specified complexity

22) **basic competence** is specialist's ability to deal with a set of professional tasks on the basis of universal, intelligent, communicative, emotional and volitional qualities (knowledge, skills, characteristics and abilities);

23) **professional competence** is specialist's ability to deal with a set of professional tasks on the basis of integrated knowledge, skills and experience as well as personal qualities to effectively carry out professional activities;

24) **special competence** - the ability of specialist to solve a set of professional tasks in the chosen field of activity on the basis of specific knowledge and skills;

25) **cycle** is a set of subjects (modules) of one educational orientation;

26) **modular education** is a way of organizing the educational process on the basis of development of modular educational programs;

27) **modular education program** is part of an educational program aimed at the development of knowledge, skills and competencies required to perform certain professional activities within the same specialty;

28) **the training module** is independent, self-sufficient and complete part of the educational program or training period;

29) **a result of learning** - statements, defining what will the students know, or be able to perform as a result of learning activities. The result of learning can also be formed from the combination of competence on training modules generated with access to qualification;

30) **evaluation criteria** is a list of the main types of training activities for the modules for decision on assessment for compliance with the requirements for the competence

31) **Bachelor of Applied Sciences** - qualification assigned to those who have mastered the educational programs of post-secondary education;

32) **A functional map of specialty qualifications** - structured description of job functions and professional tasks performed by workers in certain employment qualification within a particular area of professional activity.

2. List of abbreviations and references

The educational program uses the following abbreviations:

- LRK** - The Law of The Republic Of Kazakhstan;
- SCES** - State Compulsory Educational Standard;
- GEM** - General education modules;
- SEM** - socio-economic modules;
- GHM** - general humanitarian modules;
- BGPM** - basic general professional modules
- PM** - professional modules;
- SD** - special disciplines;
- TC** - Theoretical classes;
- M** - module;
- IWS** - Independent work of a student;
- RT** - Result of training;
- BGPM** - basic general professional modules
- MO** - modules, defined by the Organization of education
- PP** - professional practice;
- DP** - diploma project;
- IA** - Interim assessment;
- ALPRAQ** - assessment of the level of professional readiness and assignment of qualification;
- K** - Consultations;
- EA** - Extracurricular Activities;
- E** - exams;
- FSA** - final state attestation
- VT** - vacation time

3. Analysis of the specialty

Qualification requirements

Qualifications

1414000 «Furniture manufacturing (by types)»

Working qualifications
**141405 2 -
Assembler of
wood products**

1. Perform assembly operations of various furniture products with a variety of appliances and special-purpose machines
2. Know the design and rules of resetting and operation of machines, tools and equipment used in the assembly of wood products
3. Install the mounting fixtures and accessories, perform splice of assembly units and furniture products
4. Perform upholstering of parts and assembly units of furniture with upholstery
5. Control over precision and quality of assembly, and the work of all elements of the product
6. Read assembly drawings of furniture products
7. Follow the labor safety regulations, industrial sanitation, fire and occupational safety when performing assembly work

Working qualifications
**141407 2 – Master of
carpentry and
furniture production**

1. Design and manufacture joinery and furniture products on machines and with the help of various appliances.
2. Perform repair and restoration of joinery and furniture products.
3. Develop and produce templates and appliances with the help of variety of machines and tools.
4. Develop designs and specifications, read technical drawings.
5. Use the methods and means of technical measurements in woodworking.
6. Perform facing and finishing of wood products
7. Perform works on woodworking machines of various types.
8. Choose a cutting tool and instrumentation by the type of work.
9. Follow the safety regulations, fire and occupational safety.

**Mid-ranking
specialist
141406 3 -
Technician-
technologist**

1. Develop and lead the technological process of structural unit of wood-working production
2. Develop product design using computer-aided design
3. Develop flow-process charts for all phases of products manufacturing of woodworking industry using ACS
4. Perform works on woodworking machines with CNC
5. Perform technological calculations of equipment, raw materials consumption, materials and tools
6. Conduct quality conformance inspection of wood products according to requirements of technical documentation
7. Analyze the occurrence of defects and defective products
8. Develop measures to prevent defects and defective products
9. Prepare documentation for the product quality management
10. Manage and plan the work of the structural unit
11. Monitor compliance with safety regulations, fire and labor safety of the structural unit

**B.A.Sc.
Junior
production
engineer**

1. Develop and implement advanced technological processes of wood processing using means of FACS, automation and mechanization
2. Set the order of works execution and the step-by-step route of parts and assembly products processing
3. Draw up plans for the placement of, organization of technical equipment of workplace, calculate production capacity and equipment loading
4. Participate in the development of technically based time standard, calculate standards of material costs (standards of raw materials consumption, semi-finished products, materials, tools, process fuel, energy), economic efficiency of designed technological processes
5. Develop technological standards, instructions, assembly diagrams, operation flow charts
6. Develop technical specifications for the design of special equipment, tools and accessories, automation and mechanization means
7. Participate in the development of control programs (for CNC equipment), in tuning of the developed programs, corrections, developing of instructions of work with programs
8. Develop and participate in carrying out of experimental works on implementation of new technological processes and introduction of them into production, and monitor their implementation
9. Exercise control over compliance with technological discipline in workshops and the correct operation of equipment
10. Analyze the reasons for defects and the output of low quality and low grade products, participate in the development of measures for their prevention and elimination
11. Develop methods of technical control and product testing
12. Consider rationalization proposals to improve production technology and provide conclusions on the appropriateness of their use in the enterprise
13. Perform works on several working qualifications

1414000 «Furniture manufacturing (by types)»

141405 2 Assembler of wood products

Assembly of parts, units and articles of furniture of wood materials, verification of the accuracy and quality of furniture assembly of wood products

Perform simple operations on processing of wood with hand and electrified tools;
Run setup, adjustment and maintenance of manual and electrified tools for wood processing;
Assemble components, assembly units of wood products and wood-based materials in accordance with the technical documentation for the product;
Perform adjustment of machines, tools and equipment used in the assembly of products of wood and wood-based materials;
Read drawings for carpentry and furniture products;
Install the mounting fixtures and accessories for finished products of wood and wood-based materials;
Install glass and mirror details for products of wood and wood-based materials;
Perform upholstery and lacing for products of wood and wood-based materials with facing and bandaging material

BGPM 01
BGPM 02
BGPM 03
BGPM 04
BGPM 05
BGPM 06
BGPM 07
BGPM 08
PM 01
PM 02
PM 03
PM 04
PM 05
PM 06
PM 07
PM 08

141407 2 Master of carpentry and furniture production

Performs works on the production of joinery products and furniture.
Uses needed woodworking machinery in the manufacture of details.
Performs repair and restoration of wood joinery, furniture and constructions.

Perform simple and medium complexity operations on the various kinds of woodworking machines;
Develop and produce templates and appliances using a variety of machines and tools;
Manufacture woodwork and furniture products in accordance with the technical documentation for the product;
Choose, evaluate, sort, and use wood and wood products at work;
Use the methods and means of technical measurements in woodworking;
Perform technical drawings, designs, specifications;
Perform the cutting of material according to the drawings;
Perform rough and finish works on workpieces;
Perform finishing of carpentry and furniture products;
Apply various ways of wood and wood materials protection;
Make setting up and maintenance of woodworking machinery, equipment and tools

Mid-ranking specialist
141406 3 - Technician-technologist
 Providing woodworking process, producing a material and furniture of wood, adjusting, maintenance of production equipment, accessories and tools.

Development and maintenance of technological processes for the production of wood products;
 Participate in the development of technology of processing of wood and wood materials;
 Use legal documents relating to the professional activity;
 Organization of production activities within the structural unit and managing of it

PM 06
 PM 07
 PM 08

**B.A.Sc.
 Junior production engineer**
 Development, implementation and organization of technological processes on the woodworking and furniture industries in accordance with the regulations and technical requirements for the manufactured products.

Development and implementation of technological processes of woodworking industries;
 Develop technological solutions for wood processing and wood raw materials that meet the requirements of long-term development of the industry and standards for products;
 Maintaining technological processes of production of woodworking industries;
 Competently make calculations of technological processes of wood processing and consumption of wood raw material for the manufacture of wood products;
 Prepare and use legal documents relating to the professional activity;
 Organization of production activities within the structural unit and managing of it

PM 09
 PM 10
 PM 11
 PM 12

4. Requirements to the level of preparation of students

In section «Requirements to the level of preparation of students» the necessary basic and professional competencies on levels of related specialty qualifications are defined in accordance with the national qualifications framework, sectoral qualifications frameworks and professional standards.

The integrated educational program on a specialty 1414000, “Furniture manufacturing (by types)” is a cross-layer, and provides training in the following qualifications:

Level 3	Level 4	Level 5
<u>141405 2 - Assembler of wood products</u> <u>141407 2 Master of carpentry and furniture production</u>	<u>141406 3 - Technician-technologist</u>	<u>Junior production engineer</u>

Competencies	Industry / enterprise requirements to the level of preparation of students			
Basic competencies	Junior production engineer	141406 3 - Technician-technologist	<u>141405 2 - Assembler of wood products</u> <u>141407 2 – Master of carpentry and furniture production</u>	BC 1 Update knowledge and skills throughout life BC 2 Be able to work independently and in a team BC 3 Organize workspace, prepare tools and appliances, raw materials to the production process BC 4 Choose the most rational ways and means of implementing of professional activities BC 5 Possess the skills of working with technical documentation and reference books, standards and regulatory documents BC 6 Have the culture of thinking, speak the official language of the Republic of Kazakhstan - Kazakh language, and official use language - Russian. Properly use the professional vocabulary, apply knowledge of a foreign language in their professional activity BC 7 Improve the professional knowledge and skills BC 8 Follow safety instructions, fire safety, occupational sanitation; BC 9 Possess computer methods of gathering, storing and processing information; BC 10 Promote and maintain a healthy lifestyle, have abilities and skills of physical self-improvement.
				BC 1 Update knowledge and skills throughout life BC 2 Be able to work independently and in a team BC 3 Organize workspace, prepare tools and appliances, raw

		<p>materials to the production process</p> <p>BC 4 Choose the most rational ways and means of implementing of professional activities</p> <p>BC 5 Possess the skills of working with technical documentation and reference books, standards and regulatory documents</p> <p>BC 6 Have the culture of thinking, speak the official language of the Republic of Kazakhstan - Kazakh language, and official use language - Russian. Properly use the professional vocabulary, apply knowledge of a foreign language in their professional activity</p> <p>BC 7 Improve the professional knowledge and skills</p> <p>BC 8 Follow safety instructions, fire safety, occupational sanitation</p> <p>BC 9 Possess computer methods of gathering, storing and processing information</p> <p>BC 10 Promote and maintain a healthy lifestyle, have abilities and skills of physical self-improvement</p>
		<p>BC 1 Update knowledge and skills throughout life</p> <p>BC 2 Organize own activities, determine methods and ways to perform professional tasks, evaluate their effectiveness and quality</p> <p>BC 3 Solve problems, assess the risks and make decisions in nonstandard situations</p> <p>BC 4 Perform search, analysis and evaluation of the information needed for formulating and solving professional problems, professional and personal development</p> <p>BC 5 Use information and communication technologies to improve the professional activity</p> <p>BC 6 Work in a collective and team to ensure its cohesion, effectively communicate with colleagues, management, customers</p> <p>BC 7 Set goals, motivate subordinates' activities, organize and supervise their work with the assumption of responsibility for the results of the job</p> <p>BC 8 Independently define the tasks of professional and personal development, perform self-education, consciously plan advanced training.</p> <p>BC 9 Be prepared for changing technologies in professional work</p> <p>BC 10 Promote and maintain a healthy lifestyle, have abilities and skills of physical self-improvement</p>

		<p>PC 3.1 Develop flow-process charts for all phases of products manufacturing</p> <p>PC 3.2 Perform technological calculations of equipment, raw materials consumption, materials and tools</p> <p>PC 3.3 Perform technical drawings, designs, specifications using special software</p> <p>PC 3.4 Adjust, maintain and repair industrial equipment, instrumentation and tools</p> <p>PC 3.5 Define species and sort of sawn wood</p> <p>PC 3.6 Use measuring instruments</p> <p>PC 3.7 Use standards for the manufactured products</p> <p>PC 3.8 Use modern information technology, standard software in the professional activities</p> <p>PC 3.9 Participate in developing of control programs algorithm for CNC machines, used in the technological chain</p>
		<p>PC 4.1 Participate in developing of technological processes of wood working production, processes of technological preparation of the production, construction of products using computer-aided design system (CADS)</p> <p>PC 4.2 Develop flow-process charts for all phases of wood working production</p> <p>PC 4.3 Organize conduct of the technological process of woodworking production</p> <p>PC 4.4 Perform technological calculations of equipment, raw materials consumption, materials and labor costs for product manufacturing in accordance with normative and technical documentation and production volumes</p> <p>PC 4.5 Control the compliance of woodworking production products quality with technical documentation requirements</p> <p>PC 4.6 Develop control programs algorithm for CNC machines, used in the technological chain</p> <p>PC 4.7 Participate in planning and managing of the work of the structural unit</p> <p>PC 4.8 Analyze the process and results of structural unit activities</p>

5. Structure of educational program

Professional competences	Educational module	Educational goals		Code of forming basic competence	
		Knowledge	Abilities Skills		
Qualification: «Assembler of wood products», «Master of carpentry and furniture production»					
Primary general professional modules					
PC 2.4 Select, assess, sort and use wood and wood products. PC 2.8 Produce roughing and finishing of blanks	Acceptance, selection and use of wood and wood products	Structure of wood and wood products; physical, chemical and mechanical characteristics; nature of use in manufacturing of carpentry and furniture products; principal species of wood, its characteristics, flaw and grade in wood; basics of timber merchandizing; storage and drying regulations of wood and lumber products; nature and grading of wood products, area of its application; main types of antiseptic, antipyrone and other wood preservatives; storage conditions, lumber treatment, fire and insect protection measures	Individual use of reference literature; Identification of wood species, sort of wood according to flaw, rational use of it in manufacturing of carpentry and furniture products; storage and drying of wood and lumber products; selection and use of wood materials(veneer, plywood, chipboard and fibreboard) for manufacturing carpentry and furniture products; use of professional terminology, development of conscientious attitude to the quality of wood and wood products in this sphere	Identify the type of raw material and proper technological processes of woodworking; conduct scaling and quality rating of wood products and semi-products; distinguish texture of main wood species; according to quality, quantity and size of flaw, determine application of dimension parts; count allowance under mechanical conversion; select and apply main constructional and supporting materials for manufacturing carpentry and furniture products; storage and drying regulations of wood and lumber products; prepare antiseptic compositions by prescription; performance of essential procedures against pests of wood and lumber products	BC 1.1- BC 1.10

PC1.5 Interpretation of carpentry and furniture products' drawings. PC 2.5 Prepare technical drawings, drafts, specifications.	Development, execution and interpretation of drawings and drafts of products	General provisions of the Unified System of Design Documentation(USDD); general standard regulations for carpentry and furniture products; main types and rules of carpentry and furniture drawings' interpretation; General regulations for design of drawings, drafts, schemes of carpentry and furniture products and its graphic design; Basics of automatic preparation of graphical part in AutoCAD program and its graphic design; Regulations for technical measurement and dimensioning	Use of the Unified System of Design Documentation(USDD), standards for carpentry and furniture products, reference literature; Interpret drawings, drafts, schemes and technical documentation of carpentry and furniture products; Use of basics of automatic preparation of graphical part in AutoCAD program and its graphic design,	Perform design of drawings, drafts, and schemes of carpentry and furniture products using both drawing tools and computer; perform technical measurement and dimensioning; use of basics of automatic preparation of graphical part in AutoCAD program.	BC 1.1- BC 1.10
PC2.5 Apply methods and tools of technical measurements in woodworking.	Rules and practices of technical measurement performance in woodworking	Title, application and conditions of use of the most common devices, control measuring tools in woodworking during technical measurements; scoring, its types and measurements; rules applied during work layout	Interpret and apply technical documentation during technical measurements; Performance of simple operations, measurement of blanks and parts (using a simple control measuring tool and devices)	Apply preparation and scoring practices of blanks for parts and safe work conditions; score boards, lump woods and filing boards; control of partial and final work results under specified criteria and indicators using controlling and measuring tools	BC 1.1- BC 1.10

<p>PC 1.1 Perform simple operations on wood processing using manual and electrified tool.</p> <p>PC 1.2 Make adjustment, fettling and maintenance of manual and electrified tool of woodworking</p>	<p>Rules and practices of manual and electrified tool use</p>	<p>Application, configuration of service instructions, maintenance, adjustment of manual tool of woodworking; application, configuration of service instructions, maintenance, adjustment of electrified tool of woodworking;</p> <p>electrical safety rules during use of electrified tool;</p> <p>basic operations in woodworking; work and workplace management during work with manual and electrified tools;</p> <p>basics of electrical technology within the framework actual work; version types of alternating-current motor;</p> <p>types of equipment and tool with electric driver;</p> <p>regulations for setting-up and commissioning.</p>	<p>Understand basic operations of manual wood and wood products' processing; chiseling, filing, drilling, chiseling, shaping and polishing; understand basic operations and practices of wood and wood products' processing using electrified tool, apply methods and practices of woodworking using manual and electrified tools; keep regulations of safe operation with manual and electrified tools.</p>	<p>Conduct regulating, adjusting procedures of manual and electrified tool; interpret kinematic schemes; perform wood and wood products' processing using manual and electrified tool;</p> <p>file wood using manual and electrified saws; shape wood using manual and electrified tool;</p> <p>chisel wood using manual and electrified tool;</p> <p>drill wood using manual and electrified tool;</p> <p>polish wood using manual and electrified tool;</p> <p>carry out quality control of processed parts.</p>	<p>BC 1.1- BC 1.10</p>
<p>PC 1.3 Make assembling of components, sub units and products of wood and wood materials in accordance with the instruction manuals of finishing item.</p> <p>PC 1.9 Check precision and quality of assembly, operation of all assembling components of the item.</p>	<p>Rules and practices of carpentry joint in manufacturing of wood products</p>	<p>Workplace management during carpentry joint and labor safety regulations;</p> <p>carpentry joints; types of carpentry joints according to GOST;</p> <p>types of carpentry products; techniques of carpentry joints; joint parts by pins, nails, screws, buckles and glue;</p> <p>gluing, types of gluing, types of wood glue preparing;</p> <p>regulation for gluing blanks; regulations of surface gluing; technological gluing process; gluing defects and elimination methods;</p> <p>regulations for gluing quality and control methods</p>	<p>Drawing of joints applied in carpentry-furniture operations;</p> <p>Identification of glue types through samples; technology of making a glue solution;</p> <p>determination of part process accuracy rate during carpentry joint; splits, tensions, adjustments and allowances.</p>	<p>Performance of simple carpentry products' joints; performance of angle joints of product's parts; joining elements of carpentry products by glue; preparation of gluing solution;</p> <p>joining products by pins, nails, screws and buckles.</p>	<p>BC 1.1- BC 1.10</p>

PC 2.9 Make operations on finishing carpentry and furniture products	Rules and practices of finishing of carpentry and furniture products	Technological process of finishing parts and furniture products of wood materials; protective-decorative coating; chemical features of finishing materials; physical features of finishing products; regulatory documents for furniture parts and products made of wood materials; labor safety instruction, fire safety and labor sanitation; work order of equipment of finishing furniture parts and products made of wood materials	Acceptance and quality control of raw materials used in technological process of finishing; operating principles of equipment for finishing furniture parts and products made of wood materials; defect identification of finishing and its elimination methods; regulations of operating with equipments and tools for finishing quality assessment; safe labor methods and practices during finishing process.	Assess quality of used raw material, chemicals and materials under technological process of finishing; Work with a finishing equipment of furniture parts and products made of wood; select equipment and aggregates for finishing process; determine quantity of essential materials; methods of finishing's defect elimination; use devices and tools for finishing's quality assessment; safe performance of finishing work	BC 1.1- BC 1.10
PC 2.1 Perform simple and medium complexity operations on woodworking machines of different types. PC 2.11 Perform fettling, maintenance of wood working equipment, set up and tool	Rules and practices of work with woodworking equipment	Woodworking machines: classification, main and spare parts; general information about applied electric engines; rotary saw: models, types of round saws, application, technical characteristics; linear milling machines (planning machine): types, application, technical characteristics, cutting tool; drilling and chain mortising machines: types, technical characteristics, cutting tool; milling machine: types, technical characteristics, cutting tool; tenoning machine: types, technical characteristics, cutting tool; polishing machine: types, technical characteristics, polishing belts (materials); combined machine: types, application, technical characteristics, cutting tool; regulations of technical commissioning of machines; practice of operation and safe labor methods	Prepare work place of woodworking machine according to the work place standard, regulations of industrial sanitation norms, labor safety, fire and electrical safety; select devices and wood cutting tool for technological operation and quality control of simple parts and products made of wood in accordance with the maintenance card; determine applicability of woodworking tool in accordance with operation manual; interpret simple drawings of wood parts under maintenance card; application regulations of measurement tool, devices for size control in woodworking industry	Practice of safe work with woodworking machines; adjustment of woodcutting machine in set-up parameters of simple wood parts and products; performance of operations under current fettling of woodworking machines; perform adjustment of wood cutting tool and control its condition under operation of woodworking machines; choose measurement tool and devices essential for size control.	BC 1.1- BC 1.10

<p>PC 1.6 Set attachment fitting and hardware on finished wood products.</p> <p>PC 1.7 Set glass product and mirrors on wood products.</p>	<p>Selection and application of attachment products, fitting, hardware and supplementary materials for carpentry and furniture products</p>	<p>Range and technical conditions on attachment fitting, hardware, glass products, mirrors, finishing and bandaging materials;</p> <p>types of glasses for carpentry and furniture products, bandaging and finishing materials for upholstery;</p> <p>practices of setting of attachment fitting, hardware, glass products, mirrors on carpentry and furniture products; principle and regulations of manual and electrified machine use for hardware and attachment fitting installation;</p> <p>attachment products, fitting, hardware and supplementary materials operation safety.</p>	<p>Select tools, equipment and setup for hardware and attachment fitting installation;</p> <p>Installation methods of mirror and glass products on finished furniture products;</p> <p>principles of bandaging and finishing of upholstery.</p>	<p>Use of tools, equipment, and setup for hardware and attachment fitting installation;</p> <p>visual quality check of parts, hardware, and attachment fitting;</p> <p>check of availability of all essential parts, hardware, and attachment fitting in accordance with technical documentation for finishing product;;</p> <p>set and regulate essential hardware and attachment fitting;</p> <p>eliminated detected defects of regulation of attachment fitting; install mirrors and glass products on finished furniture products;</p> <p>safe operations with attachment fittings, hardware and supplementary materials.</p>	<p>BC 1.1- BC 1.10</p>
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Professional modules				
Production technology and template and device assembly	Labor safety and sanitation rules in industrial premises producing templates and devices; configuration, resetting and commissioning regulations of machines, tool and device for template and device production; characteristics of materials used for template and device production; marking of blanks for parts of templates and devices; methods of cutting blanks for templates and devices; methods of mechanical conversion of blanks for parts of templates and devices; methods of installing fitting and hardware on templates; methods of finishing templates and devices; rules and practices of technological testing of templates and devices; rules and practices of maintenance, check and repair process of templates and devices; classification of templates and devices for carpentry and furniture products by type and application; methods of template construction development for manufacturing of carpentry and furniture products	Apply labor safety and sanitation rules in industrial premises, adjust and use machines, tools and equipment for producing templates and devices; select essential materials for production of templates and devices; mark blanks for parts of templates and devices; cut blanks for parts of templates and devices; perform mechanical conversion of blanks for parts of templates and devices; make joints of parts of templates and devices; install fitting and hardware on templates and devices; make finishing of templates and devices; make technological test of templates and devices; carry out maintenance, check and repair process of templates and devices; classify templates and devices by type and application; develop construction of templates and devices.	Production of simple-shaped marking templates for cutting and marking of finishing materials, plates, fabrics and polishing plating; Selection of materials for parts of templates and devices on current specifications; Production of simple straight line templates for positional wood-working machines with screw stop according to samples; provide minor repair of templates and devices; perform maintenance, storage and repair process of templates and devices.	BC 1.1- 1.10
<p>PC 1.3 Make assembly of burls, assembly components and wood products in accordance with technical documentation for finishing product.</p> <p>PC 2.2 Develop and manufacture templates and devices using various machines and tools.</p> <p>PC 2.7 Perform materials cutting under drawings.</p> <p>PC 2.8 Make rough and final processing of sub-product.</p> <p>PC 3.1 Make production chart on manufacturing carpentry and furniture products.</p> <p>PC 3.2 Perform technological counts of equipment, consumption of raw materials and tool.</p>				

<p>PC 2.3 Produce carpentry and furniture products in accordance with technical documentation on finishing product.</p> <p>PC 2.4 Select, assess, sort and apply wood and wood materials.</p> <p>PC 2.5 Apply methods and means of technical measurement in woodworking.</p> <p>PC 2.7 Provide material cutting based on drawings.</p> <p>PC 2.8 Provide rough and final processing of blanks.</p> <p>PC 2.9 Provide finishing work of carpentry and furniture products.</p>	<p>Production technology and assembly of carpentry products</p>	<p>Labor safety and sanitation rules during carpentry and assembling work; notion of technological process; main steps of technological process of manufacturing simple carpentry products manually (cutting, processing of rough blanks, gluing, reprocessing of glued blanks); typical schemes of production of simple parts and products, processing of final blanks, preliminary assembly and final assembly, clearing, finishing; processing of parts by form and size: adjustment and allowances.</p>	<p>Apply labor safety and sanitation rules during carpentry and assembling work; classify carpentry products and furniture by application and type; methods of preparation of carpentry parts, assembling units and products made of wood for finishing and facing; principles of carpentry and furniture products' construction development; principles of forming, practices of determination of functional and constructional size of carpentry products and furniture; determine accuracy rate of parts' processing during carpentry joints; splits, tensions, adjustments, allowances.</p>	<p>Drawings interpretation; produce, select and provide preparation and adjustment of toll during production and assembly of carpentry products; make operation of producing carpentry products using manual and electrified tool and woodworking equipment; consecutive production and assembly of carpentry products: 1) work estimation and preparation; 2) parts blank; 3) blank cutting; 4) part marking; 5) part processing; 6) preliminary assembly, adjustment and product's core check; 7) clearing; 8) final assembly; 9) finishing; production and assembly of carpentry products of constructional application in accordance with technical documentation (window and door blocks, window boards, partitions, floor boards, etc.)</p>	<p>BC 1.1- BC 1.10</p>
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<p>PC 2.3 Produce carpentry and furniture products according to technical documentation of finishing product.</p> <p>PC 2.4 Select, assess, sort and apply wood and wood materials.</p> <p>PC 2.5 Apply methods and means of technical measurement in woodworking.</p> <p>PC 2.7 Provide material cutting based on drawings.</p> <p>PC 2.8 Provide rough and final processing of blanks.</p> <p>PC 2.9 Provide finishing work of carpentry and furniture products.</p>	<p>Production technology and assembly of cabinet furniture</p>	<p>Labor safety rules during production and assembly of cabinet furniture; application, classification of cabinet furniture; raw materials for production of cabinet furniture; features, types and stages of technological process of cabinet furniture production; regulations for interpreting drawings of production and assembly of cabinet furniture;</p> <p>general rules for design of drawings, drafts, schemes; configuration, rules of resetting and commissioning of machines, tool and equipment for cabinet furniture production.</p>	<p>Apply labor safety rules during production and assembly of cabinet furniture;</p> <p>classify cabinet furniture by application and type;</p> <p>select essential materials for production of cabinet furniture;</p> <p>interpret drawings through technological chart; adjust and apply machines, tool and equipment for cabinet furniture production.</p>	<p>Planning project of finished product at different levels;</p> <p>cutting of essential materials as parts of finished furniture;</p> <p>drilling sockets for fastening; facing of sheared edge (laminated lip, veneer, PVC foil); assembly of final product.</p>	<p>BC 1.1- BC 1.10</p>
<p>PC 2.3 Produce carpentry and furniture products according to technical documentation of finishing product.</p> <p>PC 2.4 Select, assess, sort and apply wood and wood materials.</p> <p>PC 2.5 Apply methods and means of technical measurement in woodworking.</p> <p>PC 2.7 Provide material cutting based on drawings.</p> <p>PC 2.8 Provide rough and final processing of blanks.</p> <p>PC 2.9 Provide finishing work of carpentry and furniture products.</p>	<p>Production technology and assembly of structural furniture</p>	<p>Labor safety rules during production and assembly of structural furniture application, classification of structural furniture;</p> <p>raw materials for production of cabinet furniture; features, types and stages of technological process of structural furniture production; regulations for interpreting drawings of production and assembly of structural furniture;</p> <p>general rules for design of drawings, drafts, schemes; configuration, rules of resetting and commissioning of machines, tool and equipment for structural furniture production.</p>	<p>Apply labor safety rules during production and assembly of structural furniture;</p> <p>classify cabinet furniture by application and type;</p> <p>select essential materials for production of structural furniture;</p> <p>interpret drawings through technological chart; adjust and apply machines, tool and equipment for structural furniture production.</p>	<p>Planning project of finished product at different levels;</p> <p>cutting of essential materials as parts of finished furniture;</p> <p>drilling sockets for fastening; facing of sheared edge (laminated lip, veneer, PVC foil); assembly of final product.</p>	<p>BC 1.1- BC 1.10</p>

<p>PC 1.8 Perform finishing and bandaging of wood products by finishing and bandaging materials.</p> <p>PC 2.3 Produce carpentry and furniture products according to technical documentation of finishing product.</p> <p>PC 2.5 Apply methods and means of technical measurement in woodworking.</p> <p>PC 2.7 Provide material cutting based on drawings.</p> <p>PC 2.8 Provide rough and final processing of blanks.</p> <p>PC 2.9 Provide finishing work of carpentry and furniture products.</p>	<p>Technology of production, assembly and upholstery of soft furniture</p>	<p>Labor safety rules during assembly and upholstery of soft furniture; classification of soft furniture; raw materials for soft furniture production; features, types and stages of technological process of soft furniture production; general rules for design of drawings, drafts, schemes; configuration, rules of resetting and commissioning of machines, tool and equipment for soft furniture production; joint types of soft furniture's carpentry parts; preparation of upholstery; core assembly technology; technology of facing and finishing of soft furniture; technology of repair and restoration of soft furniture</p>	<p>Apply labor safety rules during production, assembly and upholstery of soft furniture;</p> <p>classify soft furniture by application and type; select essential materials for production of soft furniture; interpret drawings through technological chart; adjust and apply machines, tool and equipment for production of soft furniture; apply practices of repair and restoration of soft furniture.</p>	<p>Compilation of furniture's soft element technological formation process, calculation of norms of material consumption on soft furniture production;</p> <p>Soft furniture production in accordance with technological process:</p> <ol style="list-style-type: none"> 1. Production and assembly of wood cores; 2. facing and finishing of core; 3. cutting and tailoring of upholstery; 4. manufacturing of metal products (furniture springs, wire nets, metal elbow rests, cramps) and wire cutting; 5. preparation of upholstery and cutting of bandaging; 6. production of soft constructions (base preparation, spring selection and fastening, spring bonding, upholstery forming, facing and decorative finish); <p>repair process and restoration of soft furniture.</p>	<p>BC 1.10</p> <p>1.1-BC</p>
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Qualification: «Technician-technologist»				
Designing and construction of carpentry and furniture products using software	Construction peculiarities of carpentry and furniture products; main stages of wood products' design; goals, tasks and principles of construction-technological designing; types of construction documentation; methods of calculation and main rules of product construction; operating procedure and selection principles of automatic design system depending on set task.	Construction products' modeling using computer aided design system; interpret technical documentation of product; perform graphic works using computer aided design system.	Develop construction products' models using computer aided design system; develop and form technical documentation of product using modern computer aided design systems. make essential calculations of determining aimed technological parameters for equipment's operating mode; calculate power and capacity of wood cutting, speed of cutting and approach; calculate requirements of cutting tool; productivity of equipment, determine loading; calculate and check size of allowances and size of blanks; identify surface processing methods	BC 3.1-BC 3.5 BC 3.8 BC 3.9 BC 4.1- BC 4.5
PC 3.1 Compile production chart of carpentry and furniture products. PC 3.2 Perform process calculation of equipment, raw material, material and tool consumption. PC 3.3 Make technical drawings, drafts, specifications using software.				

<p>PC 3.7 Use standards of output products.</p> <p>PC 3.9 Use modern information technology, standard software at work.</p> <p>PC 3.10 Participate in development of technological processes of woodworking industry, processes of technological preparation of productions, products' construction using computer aided design system (CAD).</p> <p>PC 4.3 Compile production chart in all stages of manufacturing products of woodworking industry.</p>	<p>Development and organization of carpentry and furniture products</p>	<p>Regulations of development, forming, and interpreting of construction and technological documentation; application and types of technological documents; content, functions, and opportunities of information technology use in woodworking; methods of technological process design of part's production; regulations of USDD and USTD for technical and technological paper work; designing method of technological process of part's production; typical technological processes of part's production; typical schemes of mechanization and automation of technological processes of woodworking; elements of technological operation; application and construction-technological markers of parts, production; characteristics of raw material and products of woodworking industry; physical-mechanical features of raw materials and materials; types of cutting tools; classification, principles of technological equipment's operation; application of machine devices; main principles of cutting tool equipment's fettling.</p>	<p>Use standard technical and technological documentation in development of technological process of carpentry and furniture production; apply computer and telecommunication means; use application software packages in development of: technological processes, technological preparation of production, product's construction; identify type of production; design technological processes using data base of typical technological processes; designing of technological process of product's manufacturing; characteristics of raw material and products of woodworking industry; types of cutting tools.</p>	<p>Development of documentation, use of information and professional systems; Development of technological process of woodworking industry; implementation of technological processes of goods manufacturing in production; use of typical elements and systems of automatic control over technological processes;</p>	<p>BC 3.1- BC 3.5 BC 3.7-BC 3.9</p>
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PC 3.2 Perform process calculation of equipment, raw material, material and tool consumption.	Calculation consumption of raw materials, materials and equipment during carpentry and furniture production	Types and methods of calculation of consumption of raw materials, materials, technological equipment, technological setup, devices, cutting, measuring tool for carpentry and furniture production;	Make calculations on consumption of raw materials, materials, technological equipment, technological setup, devices, cutting, measuring tool for carpentry and furniture production; Interpretation of drawings of carpentry and furniture products; control of technological discipline in stages of technological process; calculate time standards and analyze working hours; assess quality and reliability of products.	Selection and calculation of consumption of raw materials, materials, technological equipment, technological setup, devices, cutting, measuring tool for carpentry and furniture production; interpretation of drawing of carpentry and furniture products; compilation of schemes and processing chart of carpentry and furniture production using CAD system; development of carpentry and furniture construction compilation of parts' specification.	BC 3.1-BC 3.5 BC 3.9
PC 3.8 Make calculation and analysis of technical-economic indicators of woodworking industry's activities.	Economic basics of production at woodworking enterprise	Main legal organizational form of business; economic basics of activities of woodworking enterprise in a market economy; management structure of wood working enterprise and industrial organization; organization of industrial and technological processes; material and equipment, financial resources, branches and organizations, efficient use of indicators, type of wages.	Select economically efficient methods of carpentry and furniture production; efficient use of available resources for rise in profitability of industry; building economic system of organization (enterprise) in a market economy.	Calculate main technical-economic indicators of woodworking industry's activities, compile quality documentation of products; make calculations of main technical-economic indicators during production.	BC 3.1 BC 3.4 BC 3.5 BC 3.9

Qualification «Junior production engineer»				
Design of areas and workshops of woodworking and furniture producing enterprises	General standards of designing woodworking workshops and areas; production technology of woodworking and furniture products; forms and regulations of technological paper work according to regulatory documents; principles of computer aided design system's operation; regulatory and guidance documentation and reference materials of computer aided design system; project documentation paperwork; workplace safety and health rules; regulations for structure and content of project documentation.	Design workshops, areas of carpentry and furniture industries; make technological paperwork; interpret drawings; develop nonstandard (non-typical) technological processes on custom manufacturing; identify types and methods of blanks' acceptance; develop technological operations; select technological equipment and technological setup, devices, cutting, measuring tool; develop recommendations on part's technology improvement; calculate requirement of cutting tool, equipment's productivity, determine loading; calculate and check size of allowances and size of blanks; calculate environmental risks and estimate environmental damage; develop measures providing safe working environment	Work with reference literature, regulatory documents on calculation and design of workshops and areas in production of carpentry and furniture products, including use of modern software; reconstruction of woodworking workshops and areas using advanced technology and productive equipment.	BC 3.4 BC 3.5 BC 3.7 BC 4.1-BC 4.5 BC 4.8
PC 3.2 Make technological calculations of equipment, raw materials, materials, and tool. PC 3.3 Make technical drawings, drafts, specifications using software. PC 3.9 Use modern information technology, standard software at work. PC 4.2 Design workshops and areas for production of carpentry and furniture products.				

<p>PC 4.2 Design workshops and areas for production of carpentry and furniture products.</p> <p>PC 4.4 Organize technological process management of woodworking industry.</p>	<p>Labor safety management at areas and workshops of woodworking and furniture enterprises</p>	<p>General information about industrial sanitation; Safety techniques at work; basics of electrical safety; general information about fire safety; labor safety management, management structure, operational organization of labor safety and joint committees' (committees) labor safety activities; basic of technological processes, operation of woodworking equipment, applied raw materials and materials; standard regulations on labor safety awareness control; technologies, forms, means and methods of labor safety briefing, labor safety training and labor safety awareness control; labor safety control; types of obligations for security breach; security aspects in case of emergency.</p>	<p>use reference information database, containing labor safety documents and materials. meet safety procedures in use of transport, vehicles, mechanisms, devices, setup and tools; observe electrical safety; provide aid in case of industrial accident; keep fire safety; analyze and forecast dangers during rescue operations.</p>	<p>Organize labor safety management at areas and workshops; control over labor safety and fire safety observance at area and workshop; apply security methods and practices; use collective and personal defense against occupational hazards as well as fire extinguishers, check accuracy of protection equipment.</p>	<p>BC 3.4 BC 3.8 BC 3.9 BC 4.2 BC 4.4 BC 4.5 BC 4.7</p>
<p>PC 4.2 Design workshops and areas for production of carpentry and furniture products.</p> <p>PC 4.4 Organize technological process management of woodworking industry.</p>	<p>Organize environmental security of enterprise</p>	<p>Environmental requirements of the legislation; principles of rational use of natural resources; conservation of biodiversity and principles of environmentally conscious forest use; basics of industrial ecology; notions, goals, tasks, methods and practices of organization and order of eco-audit.</p>	<p>Assess the environmental impact of negative anthropogenic factors; preserve the habitat of wildlife through professional activity;</p>	<p>Organize environmentally safe operation of the unit.</p>	<p>BC 3.4 BC 3.8 BC 3.9 BC 4.2 BC 4.4 BC 4.5 BC 4.7</p>

<p>PC 4.6 Conduct quality conformance inspection of woodworking industry according to requirements of technical documentation.</p> <p>PC 4.8 Participate in planning and management of structural unit.</p> <p>PC 4.9 Analyze the process and results of structural unit's activities.</p>	<p>Organization and management of industrial activity in the framework of structural unit.</p>	<p>Industrial peculiarities in the sphere of professional activity; principles and methods of organization of industrial and technological processes; principles of business communication in a team; methods of control and regulatory documentation for product's quality management.</p>	<p>Rationally organize positions, participate in placing of employees, provide them with work equipment; inform staff about planned tasks for the quantity and quality of products; define responsibility and authority of the staff; make and implement managerial decisions; motivate employees for solving production problems; manage conflict, stress and risk; fill in report documentation and analyze work of the unit; apply norms of legal regulation</p>	<p>Industrial planning in the framework of a structural unit; management of a structural unit; ensure interaction of related business units; analyze the results of unit's activities.</p>	<p>BC 4.1 BC 4.2 BC 4.4 BC 4.5</p>
<p>PC 4.1 Develop technological processes of woodworking industry, processes of industry's technological preparation, construction of products using computer aided design system (CAD).</p> <p>PC 4.4 Organize technological process management of woodworking industry</p>	<p>Marketing research and identification of demand for new product</p>	<p>Principles and conceptual approaches to marketing research conduction; methods of collecting information in marketing; marketing complex, including management of product range, pricing and development of price strategy; application, infrastructure, information support, terms and processes, legal regulation of entrepreneurship; market economy's concept, components of marketing activity and their characteristics.</p>	<p>Develop the strategy of management; marketing planning and management; use information technologies in the sphere of industrial management; forecasting demand for new products.</p>	<p>Systematic collection, processing and analysis of marketing activity data; assessment of status and trends (market conditions) of market development; consumer behavior survey; the analysis of activity of competitors, suppliers, intermediaries; formation of distribution channels and targeted use of incentives.</p>	<p>BC 4.1 - BC 4.10</p>

Industrial training and professional internship					
Industrial training					
PC 1.1-PC 1.5 PC 2.1-PC 2.5	Educational internship «Acquisition of primary wood-working skills»	Types and features of wood, types of woodworking; marking by measuring tools and woodworking accuracy control; application, configuration and commissioning rules of woodworking machines, electrified and manual tools, devices, maintenance rules; types of adjustment and joint of carpentry elements; carpentry joints;; glues: types, compositions and main features; types of crack sealing, knots and damages on the parts' surface; design and production technology of manual and electrified of carpentry and furniture products, technical specifications for the manufacturing of various carpentry and furniture products; safety rules, industrial sanitation and fire safety.	Perform simple carpentry operations; process wood materials manually and with electrified tools on woodworking machines, cut and seal knots and resin streaks; manufacture and install in place the carpentry products; clean parts after machining and prepare them for finishing; perform carpentry joining; preparation, use, and storage; follow the commissioning rules of woodworking machines, electrified and manual tools and devices, maintenance rules, observe safety rules, industrial sanitation and fire safety.	Organize a workplace; marking by measuring tools; the control accuracy of woodworking; work with manual and electrified tools; wood cutting; wood planing; wood drilling; wood chiseling; chisel cutting; manufacture of carpentry joints; sealing the wood defects; wood finishing; manufacture of straight line blanks of carpentry products using manual and electrified tool; manufacturing of molded stocks on machine.	BC 1.1- BC 1.10
Professional internship					

PC 1.1- PC 1.10	Industrial training for obtaining a working profession 141405 2-«Assembler of wood products»	<p>Work place organization; rules of labor safety and industrial sanitation when performing assembly work;</p> <p>general notions of assembly; manual assembly;</p> <p>machines, tool and equipment for assembly work production;</p> <p>rules, methods and techniques of: surfaces marking, gluing of railing, drilling and finishing of holes; assembly and mounting of carpentry partitions;</p> <p>assembly jigs;</p> <p>assembly of core products;</p> <p>range of hardware and attachment fitting used for wood furniture;</p> <p>installation methods of mirror and glass products on furniture made of wood materials;</p> <p>accuracy of the assembly.</p>	<p>Rational work organization at work place;</p> <p>observe technological process of the performed work;</p> <p>observe the rules of commissioning and maintenance of the equipment, device and tool for operation;</p> <p>fulfill the norms of materials' consumption for the performed work;</p> <p>performance of basic operations on the assembly of components, units and products made of wood and wood materials;</p> <p>installation of attachment fittings and hardware on wood products;</p> <p>installation of glass products and mirrors on wood products and wood materials;</p> <p>performance of finishing and banding of wood products and wood materials by finishing and banding materials;</p> <p>check of accuracy and quality of assembly, work of all components of the product;</p> <p>observe safe and sanitary methods of work, basic tools and techniques of prevention and suppression of fires in the workplace.</p>	<p>Apply the rules of labor safety and industrial sanitation when performing assembly work;</p> <p>set up and apply machines, tools and equipment for assembly work production;</p> <p>perform preliminary (group) assembly manually and in assembly jigs;</p> <p>perform assembly joints of various types;</p> <p>perform intermediate processing of parts and assembly units;</p> <p>make general assembly: manually, in assembly jigs,</p> <p>on stocks;</p> <p>perform installation of attachment fitting, glass products, mirrors on carpentry and furniture products;</p> <p>perform upholstery and banding of wood products and wood materials by finishing and banding materials;</p> <p>check the accuracy and quality of assembly, work of all components of the product.</p>	BC 1.1- BC 1.10
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PC 2.1- PC 2.11	<p data-bbox="129 1352 272 1682">Industrial training for obtaining a working profession 141407 2 «Master of carpentry and furniture production»</p> <p data-bbox="129 936 1307 1352"> Labor safety and industrial sanitation rules in the production facilities for the manufacture of carpentry and furniture products; configuration, set up and commissioning rules of machines, tool and equipment; characteristics of the materials used in template and device production; methods of blanks' marking for carpentry and furniture products; methods of blanks' cutting for products; installation types on templates and devices of fitting and hardware; types of finishing of carpentry and furniture products; terms and regulations of technological tests of carpentry and furniture products; terms and regulations of maintenance, check, and repair process of carpentry and furniture products by type and application; methods of carpentry and furniture products' construction development; main types of defects, types of repair process and restoration of carpentry and furniture products; rules of carpentry work quality control; classification of carpentry products and furniture by application and type; main technological practices of carpentry and furniture products' construction development; main principles of forming, methods of identifying functional constructional size of carpentry products and furniture. </p> <p data-bbox="129 645 1337 936"> Apply safety rules and industrial sanitation in production facilities; set up and apply machines, tool and equipment for carpentry and furniture products' manufacturing; select essential materials for carpentry and furniture products; mark blanks for parts of carpentry and furniture products; perform cutting of blanks for parts of carpentry and furniture products; perform machining of blanks for parts of carpentry and furniture products; perform parts' joining; install on carpentry and furniture products fitting and hardware; perform finishing of carpentry and furniture products; conduct technological tests of products; classify the carpentry and furniture products by type and application; develop carpentry and furniture products' construction; identify the main types of defects, perform repair process and restoration of carpentry products and furniture; </p> <p data-bbox="129 360 1246 645"> Selection and cutting of blanks, machining and assembly of parts' templates and devices for production of carpentry and furniture products; finishing of templates and devices; conduction of technological tests, maintenance, storage and repair process of templates and devices; construction of templates and devices for manufacturing of carpentry and furniture products; performance of carpentry joining; repair process and restoration of carpentry and furniture products; construction of carpentry products and furniture. preparation of surface of parts', knots, assembly units, products made of wood and wood materials for finishing and facing; finishing of surface, knots, assembly units, products made of wood and wood materials by paint-and-lacquer materials; facing of parts' surface, knots, assembly units, products made of wood and wood materials. </p>	BC 1.1- BC 1.10
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			check quality of performed carpentry operations; classify carpentry products and furniture by application and type; develop carpentry and furniture products' construction; determine form, calculate and determine functional and constructional size of carpentry products and furniture.		
PC 1.1- PC 1.10 PC 2.1- PC 2.11	Industrial training (according to major)	Introduction to the structure of production management; induction training; insight into the object of the training, safety and fire protection training at production site; reporting documentation for execution of works; processing and registration of technical documentation and its paper work; preparation of mounting drawings; production measurement and measuring drafts; preparation for the mounting, mounting and assembly operations; safety techniques; transport of the material and in-site production; application of mechanisms and equipment, test and commissioning; study of the rights and obligations of the master manufacturer; mounting quality control; testing before commissioning.	Make report documentation on performing operations; processing and registration of technical documentation and its paper work; preparation of mounting drawings; production measurement and measuring drafts; preparation for the mounting, mounting and assembly operations; safety techniques; transport of the material and in-site production; application of mechanisms and equipment, test and commissioning; perform obligations of the master manufacturer.	Fill in and make the reporting documentation on performing operations; processing and registration of technical documentation and its paper work; paper work; prepare mounting drawings, production measurement and measuring drafts, preparation for mounting of equipment and systems; production of the carpentry and furniture products according to the production charts.	BC 1.1-BC 1.10

PC 3.1- PC 3.10	Technological	<p>General introduction to the enterprise for the production of carpentry and furniture products; insight into the object of the training;</p> <p>study of the production technology at workplace of the major; work in the workplace as part of the production team;</p> <p>organization of logistical support of performed work.</p>	<p>Interpret drawings, estimates, production project, control their use by production teams for the organization and control of works, requisition; form technical documentation used in the production work (logs work, acts of acceptance etc.); control the types of work performed by the production team, schedules, documents, applied for the organization of work, including operating quality control schemes.</p>	<p>Perform work within the limits of the profession (with appropriate training and related professions); guide the work of the working units (production teams), ensuring observance of the labor safety rules, fire safety and environmental protection; interpret project documentation and use it during demarcation and construction works; prepare the work sheets, make acts for the hidden works, prepare reporting documentation.</p>	BC 2.1- BC 2.10
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PC 4.1- PC 4.10	Pre-graduation	<p>Introduction to the structure of production management; induction training; insight into the object of the training, safety and fire protection training at production site; reporting documentation for execution of works; processing and registration of technical documentation and its paper work; study of the rights and obligations of the master manufacturer; labor organization within the production team, wages of workers and engineering and technical personnel; rules of development, design and interpreting of construction and technological documents and types of technological applications and types of technological documentation; technique of designing of technological process of part's manufacturing; principles, forms and methods of industrial and technological processes' organization; types of defects and prevention methods; application of machine devices; main principles of set up of equipment, cutting tool; signs of workplace compliance with the requirements for determining the efficient use of equipment; indicators of quality of parts, products; methods of products' quality control.</p>	<p>Development of documentation using professional information systems; development of the technological process of woodworking industry; implementation of technological process; commissioning of technological equipment; performing control of conducting the technological process; analysis of defects occurrence of products with the development of measures for their prevention; production planning in the framework of the structural unit; managing the work of the structural unit; performing analysis of the unit's operational results; managerial decisions.</p>	<p>Development of technological processes of industry, processes of technological preparation of the industry, construction of products using computer aided design system (CAD); prepare production charts of technological process in all stages of carpentry and furniture production; organization of technological process of products' manufacturing; technological calculations of equipment, raw material and material consumption; quality conformance inspection of products; participation in planning of structural unit work, participation in leading of the structural unit, analysis of the process and results of activities of the structural unit.</p>	BC 3.1- BC 3.10
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6. CONTENT OF THE EDUCATIONAL PROGRAM (MODULES)

141405 2 - “Assembler of wood products”

141407 2 - “Master of carpentry and furniture production”

BGPM.00 - Basic general professional modules

BGPM. 01 *Acceptance, selection and use of the wood and wood materials*

Purpose:

Developing skills to perform the acceptance, selection of wood, wood materials and use them in the manufacture of wood furniture products.

Tasks:

To apply for this the knowledge of normative-technical documentation and knowledge gained during the study of special subjects.

Introduction to the module:

BGPM module.03 “Acceptance, selection and application in the work of wood and wood-based materials” is the base level and represented in the structure of the basic professional educational program on a specialty 1414000 “Furniture manufacturing (by types)” in the cycle of general professional modules.

For the acquisition of the module students use knowledge, skills, formed in the course of studying such subjects as “Wood science”, “Wood drying”, as well as the study of normative and technical documentation (GOSTs, TS) in obtaining basic special education.

Mastering the module is a necessary basis for further study of general professional and professional modules:

BGPM.02 “Development, design and reading drawings and sketches of products”

BGPM. 04 “Rules and techniques of work with manual and electric tools”

BGPM. 05 “Rules and techniques of performing carpentry joints in the manufacture of wood products”

PM. 01 “Manufacturing technology and assembly of templates”

PM. 02 “Manufacturing technology and assembly of joinery”

PM. 03 “Manufacturing technology and assembly of cabinet furniture”

PM. 04 “Manufacturing technology and assembly of structural furniture”

PM. 05 “Manufacturing technology, assembly and upholstering of soft furniture”

PM. 07 “Development and organization of the technological process for the production of woodwork and furniture”

Module content:

Section 1.

Study of structure of wood and bark. Species of wood, chemical, physical and mechanical properties, defects. Classification and standardization of forest products, the characteristics of round timber, lumber, composite wood materials. Durability and wood protection, ways of protection. Storage techniques of raw wood and wood-based materials.

Theoretical bases of wood drying, classification of drying chambers, technological process and wood drying modes.

Hydrothermal processing and preserving of wood. Fire protection of wood.

Wood materials and their use in the manufacture of joinery and furniture products. Planed, peeled, split timber, chopped wood. Rules of selection and use of wood-based materials for the manufacture of joinery and furniture products.

Rules of safety and sanitation in timber warehouses, drying facilities and manufacturing plants.

Section 2.

Selection of wood and wood-based materials by type and quality for manufacturing of joinery and furniture products. Differentiation of species of wood and wood products, determination of their quality and suitability in accordance with the normative and technical documentation. Selection of measuring tools.

Selection of types of drying chambers. Selection and definition of the drying mode. Development of technological process of drying.

Practical class No. 1. Technical measurements in the selection of raw wood and wood-based materials.

Section 3.

Warehouses for storing wood and wood materials.

Selection of wood and wood-based materials by type and quality for manufacturing of specific joinery and furniture products.

Selection of measuring tools and performing technical measurements of various kinds of raw wood and wood-based materials. Determination of quality and suitability of raw wood and wood-based materials in accordance with the normative and technical documentation.

Preparation of the modes of drying in the production. Determination of quality of wood after drying.

Practical class No. 2. Performing manufacturing tasks on stacking and holding of the drying process.

Results of learning after successful completion of the module the student should	Evaluation criteria The student must
<p>RL 1 Produce the acceptance, selection of wood materials and use them in the manufacture of wood furniture products.</p>	<p>Be able to: 1.1. organize the workplace; 1.2 work with normative and technical documentation, reference books and directories; 1.3 master professional vocabulary; 1.4 apply safety rules and industrial sanitation in warehouses of wood and wood-based materials storage; 1.5 apply in practice methods and techniques of hydrothermal processing and fire protection of wood; 1.6 select the equipment for hydrothermal processing and the protection of wood; 1.7. select and apply methods and techniques for storage of wood and wood-based materials; 1.8 select and apply in the work measuring instruments; 1.2 identify wood species; 1.10 determine the quality of wood and wood-based materials 1.11 select the necessary wood for the manufacture of joinery and furniture products; 1.12 classify types of drying chambers; 1.13 compose drying modes; 1.14 compose technological processes of drying; 1.15 perform quality control of drying</p> <p>KNOW 1.1 safety rules and industrial sanitation in warehouses of wood and wood-based materials storage; 1.2 storage techniques of raw wood and wood-based materials. 1.3 structure of different species of wood; 1.4 sorts of wood-based materials; 1.5 the main tree species; 1.6 characteristics of the wood materials used for manufacturing of joinery and furniture products; 1.7 influence of quality defects to wood raw material; 1.8 ways and methods of selection of wood-based materials for manufacturing of joinery and furniture products 1.9 classification, design and operation of drying chambers; 1.10 the technological process of wood drying; 1.11 ways and methods of hydrothermal processing and protection of wood: steeping, vatting, preservation; 1.11 types of equipment for hydrothermal processing and wood protection; 1.12 ways and methods of fire protection of wood; 1.13 rules of operation of drying Chambers</p>

BGPM.02 *Development, design and reading drawings and sketches of products*

Purpose:

Develop the knowledge and skills necessary for students to develop, design and read the technical drawings,

Tasks:

Execution of drawings, sketches and diagrams both with the use of drawing tools and on the computer using software.

Introduction to the module: is the base level and represented in the structure of the basic professional educational program by specialty 1414000 “Furniture manufacturing (by types)” in the cycle of general professional modules. For mastering the module students use knowledge and skills that are generated during the study of such subjects as “Sketching”, “Electrical engineering”, “Informatics” in obtaining basic and general secondary education.

Mastering the module is a necessary basis for further study of professional modules:

BGPM. 03 Rules and techniques of performance of technical measurements in woodworking;

BGPM. 05 Rules and techniques of performing carpentry joints in the manufacture of wood products;

PM. 01 Manufacturing technology and assembly of templates

PM. 06 Design and construction of joinery and furniture products using software.

Module content:

Section 1.

Graphic design of drawings. Drawing as a USED document. The aims and objectives of discipline, its relationship with other disciplines studied. Drawing equipment. Drawing formats. The purpose of lines in the drawing. Title block of drawing. Exercises on the contouring of lines. Information about the standard fonts. Parameters of letters and numbers. Rules of imaging letters, words and sentences. Exercises on imaging of letters and numbers. Drawing basic lines used in drawings. Writing letters and numbers in a standard font.

Subjects of extra-curricular independent work: The final graphic work. Forms of the title block in the drawing. Contouring letters and numbers with various fonts.

Geometric constructions in the performance of graphic works. Dimensioning rules on drawings: application of linear and angular dimensions. Scales. Division of line segments and circles into equal parts. Pairing lines applied in the contours of details. Inner and outer arcs conjugation. Conjugation of right line with circular arc. Exercises to implement different conjugations on the drawing. Irregular curves: ellipse, hyperbola, parabola, cycloid, spiral, involute curve - their building. Rules of building an oval. Drawing contours of parts with the use of dividing the circle into parts with the construction conjugations and application of size. **Section 2.**

Projection drawing. Engineering drawing. Types of projection.

Axonometric projections: dimetric, isometric.

Projection rules. Methods of imaging of spatial forms. Layers. Types of

and their purpose. Simple and complex layers. Designation of layers on drawings. Sections. Types of sections and their designations. Outtrigger, revolved and sections in break. Local and additional species. Hatching sections depending on the detail material. Geometric tolerances and position of surfaces. Roughness of surfaces. Dependence of surface roughness on type and method of surface treatment. Designation of deviations of shape and roughness on the drawings. Crossing of surfaces. Methods for determining the intersection of surfaces: method of supporting section planes, method of auxiliary spheres. Exercises on the definition of the intersection of various geometric shapes.

Practical class No. 1. Drawing of complex training model drawing with the implementation of simple layers and axonometric projection.

Section 3.

Drawing and reading of electric circuits. Electrical components and circuits. Conventional representation of elements of electrical circuits in the drawing. Types and designations of electric circuits. Drawing and reading of electric circuits. Plotting elements of the electrical circuits in the drawings. Dimensions and conditions elements according to GOST 2.728-14, GOST, GOST 87-2.780 2.756-76. Form of list of electric circuit elements in the drawing. Image and identification of elements of electrical circuits.

Computer graphics. Computer-aided design. Purpose and types of graphical

computer software. Rules and operating procedure with graphics program. Object snap. Image control. Construction of simple objects.

Elements of the drawings and diagrams.

Execution of electrical components and circuits using graphical programs. Hatching. Extension and connecting lines. Dimensioning and signs. Editing objects. Working with text. Frame and title block. Execution of technical documentation. Specification.

Subjects of extra-curricular independent work: Exercises for mastering of graphics program. International standards of documentation

Practical class No. 2. Fulfillment of electric circuit by the specialty. The drawing file output for printing.

Results of learning after successful completion of the module the student should	Evaluation criteria The student must
<p>RL2 Model electrical circuits using software</p> <p>PO2-1. To be able to compile and read technical drawings using the structure and purpose of a unified system of design documentation (ESKD);</p>	<p>2.1. be able to organize the workplace; 2.2 be able to work with reference books and directories; 2.3 master professional vocabulary; 2.4 perform works under the guidance of specialists of higher qualification; 2.5 understand the essence and the social significance of their future profession, to show steady interest; 2.6 to be able to work in a team, communicate effectively with colleagues, management, consumers; 2.7 apply basic regulatory requirements according to EIC, PFR, SR; 2.8 possess electrical circuits reading skills; 2.9 use of information and communication technologies to improve professional performance. 2.10 read assembly drawings and electrical diagrams; 2.11 use the structure and purpose of a unified system of design documentation/USED; 2.12 perform graphic design drawings, technical drawing and sketching, applying standards when making drawings and sketches of details; 2.13 use computer techniques for the collection, storage and processing of information; 2.14 the use information and communication technologies to improve the professional activity; 2.15 various plot lines in compliance with the standard; 2.16 perform inscriptions on drawings in standard font; 2.17 define the drawing scale, make drawings of details in the specified scale; 2.18 perform different types of conjugations and irregular curves; 2.19 to put dimensions on drawings of details of a simple form; 2.20 to carry out building of electric circuits, electrical equipment and power supply systems using the software; 2.21 read, compose and execute electrical circuits according to GOSTs; 2.22 perform builds concepts of mechanical parts for electric drives and power supply systems; 2.23 be able to build drawings, diagrams using graphics software ; 2.24 carry out layers and sections in the drawings; 2.25 explain types of cross-sections and their designations; 2.26 be able to make complex drawings of educational model with the implementation of simple layers and axonometric projection; 2.27. able to design an Assembly drawing; 2.28 apply dimensions and conditions elements according to GOST 2.728-14, GOST, GOST 2.755-87, GOST 2.756-76 when drawing schemes.</p>

BGPM. 03 *Rules and techniques of performance of technical measurements in woodworking*

Purpose:

Develop skills to perform technical measurements, select measuring tools in the production of wood furniture products.

Tasks:

To apply for this the knowledge of normative-technical documentation and knowledge gained during the study of special subjects.

Introduction to the module:

BGPM module.03 Rules and techniques of acceptance, selection and application in the work of wood and wood-based materials is the base level and represented in the structure of the basic professional educational program on a specialty 1414000 “Furniture manufacturing (by types)” in the cycle of general professional modules.

To master the module students use knowledge, skills, formed in the course of studying subjects such as fundamentals of metrology, national measurement system, the system of tolerances and landings in wood processing, as well as the study of normative-technical documentation (GOST, TS) in the preparation of the main special education.

Mastering the module is a necessary basis for further study of general professional and professional modules:

BGPM. 01 “Acceptance, selection and application in the work of wood and wood-based materials”;

BGPM.02 “Development, design and reading drawings and sketches of products”

BGPM. 04 “Rules and techniques of work with manual and electric tools”

BGPM. 05 Rules and techniques of performing carpentry joints in the manufacture of wood products;

PM. 01 “Manufacturing technology and assembly of templates”

PM. 02 “Manufacturing technology and assembly of joinery”

PM. 03 “Manufacturing technology and assembly of cabinet furniture”

PM. 04 “Manufacturing technology and assembly of structural furniture”

PM. 05 “Manufacturing technology, assembly and upholstering of soft furniture”

PM. 07 “Development and organization of the technological process for the production of woodwork and furniture”

Module content:

Section 1.

Fundamentals of metrology, standardization and certification concept. Fundamentals of technical measurements. The main provisions of the General technical standards system. Methods and means of accuracy regulation. Measuring tools, classification, selection and application rules. Rules of storage. The device, assign-

ment, rules of setting and regulation of Control and measuring instruments. Basics of technical documentation analysis.

Section 2.

Setting and adjusting the control and measuring instruments. Technical measurement of various kinds of raw materials, supplies, furniture and joinery components, processed surfaces.

Practical class No. 1. Perform practical tasks on selection of measuring tools and devices.

Section 3.

Development of technological flow-charts of manufacturing products with an indication of operational forms of control and measuring instruments and their principal characteristics and specifications and technical documentation.

Practical class No. 2. Perform practical tasks on selection of measuring tools and devices. Technical measurements at various stages of the manufacturing of joinery and furniture products.

Results of learning after successful completion of the module the student should	Evaluation criteria The student must
RL 3 Perform technical measurements in woodworking	Be able to: 1.1. organize the workplace; 1.2 work with normative and technical documentation, reference books and directories; 3.3 master professional vocabulary; 3.4 apply safety rules and industrial sanitation when carrying out measuring works; 3.5 apply in practice knowledge of normative-technical documentation 3.6 identify and apply at work the measuring tools at all stages of the production of wood furniture products. 3.7 analyze technical documentation; 3.8 perform calculations of limit dimensions and tolerances according to the drawings; 3.9 determine the nature of the conjugation (landing) according to the drawings; 3.10 develop technological flow-charts with operational indicating of types of measuring instruments; KNOW 3.1 safety rules and industrial sanitation when carrying out measuring works; 3.2 device, assignment, rules of setting and regulation of Control and measuring instruments. 3.3. basic information on the size in the woodworking; 3.4 basis of technical measurements; 3.5 types of measuring instruments; 3.6 basic information about conjugations in wood processing; 3.7 basis of substitutability in wood processing; 3.8 the system of tolerances and landings in wood processing; 3.9 qualities and roughness parameters; tolerance dimensions for the main types of machining and parts entering the finishing and assembly process; 3.10 device, assignment, rules of setting and regulation of Control and measuring instruments. 3.11 methods and means of control of treated surfaces; 3.12 operating and storage methods of measuring instruments

BGPM. 04 *Rules and techniques of work with manual and electric tools*

Purpose:

To give the students knowledge of the workplace, about the kinds of woodworking tools and the basic operations in the manufacture of joinery products and furniture.

Tasks:

Mastering of knowledge about the appointment of the bench, its structure and safety when working with him. Ensuring mastery of knowledge on the rules of work with manual and electric tools in the manufacture of joinery and furniture products. Acquaintance with wood processing operations. Mastering knowledge for selection, rules and methods of work with manual and electric tools.

Introduction to the module:

Module BGPM.04 “Rules and techniques of work with manual and electric tools” represented in the structure of the basic professional educational program on a specialty 1414000, “Furniture manufacture (by types)” in the cycle “General professional modules.”

Mastering module is a necessary basis for further study of the following modules:

BGPM. 03 Rules and techniques of performance of technical measurements in woodworking

BGPM. 05 Rules and techniques of performing carpentry joints in the manufacture of wood products

BGPM. 06 Rules and techniques of finishing and facing of joinery and furniture products

BGPM. 07 Rules and techniques for woodworking machinery

The module includes the study of such disciplines as “Technology of joinery and furniture production”, “Occupational Safety and Health”, “Materials sciences”, “Electrical engineering”.

Module content:

Section 1.

Introduction. Organization of the workplace. The concept of a Workbench. The appointment of a Workbench. Construction of a Workbench. The process of cutting wood. Cutting speed and feed rate. Types of wood cutting. Geometry of cutter and chips. The cutting angles. The forces acting during cutting. Cutting mode, and procedure of its appointment. Methods for cutting wood.

Laboratory class No. 1. Determination of wood cutting modes.

Practical class No. 1. The study of various types of cutting: chip formation and chip breaking; cutting forces and temperatures; quality of processing; tool wear; the relationship of the output characteristics.

Section 2.

Main operations when manufacturing joinery and construction products as well as furniture. Marking. Sequence and marking techniques. Requirements to marking and techniques of controlling it. Tools and devices used for marking. Sawing. Sawing techniques. Requirements to quality of sawing. Hand tool intended for sawing. Electric tool. Planing. Scraping tools for peeling planed surfaces. Planing techniques. Planing accuracy control. A hand tool

for flat planing and moulding. Electric tool. Chiseling. Techniques of chiseling and cutting by a wood chisel. Hand tool for chiseling. Electric tool. Drilling. Hand tool for drilling. Electric tool. Grinding. Tools for hand and mechanical grinding. Safety rules to follow during work with hand and electric tool.

Laboratory class No. 2. Main types and techniques of manual processing of wood natural and man made materials.

Subject of extracurricular independent work: To prepare written report on the subject of “Safety rules when working with hand and electric tool”.

Section 3.

Classification of woodworking tool. Materials for production of woodworking tool. Wear and lasting qualities. Circular saws. Frame and band saws. Milling cutters. Drills and slotting tools. Abrasive tool. Safety rules to follow in cutting tools production workshops.

Subject of extracurricular independent work: To prepare oral report on a subject “Technical characteristics of woodworking tool”.

Laboratory class No. 3. Product manufacturing technology with the use of electromechanical tools

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
LO 04: Select and work with hand and electric tool	<p>Be able to:</p> <p>4.1 prepare workplace</p> <p>4.2 work with reference materials and catalogues;</p> <p>4.3 know professional oriented terminology;</p> <p>4.4 choose, fix and work with hand and electric tool;</p> <p>4.5 follow safety rules and occupational sanitation in production facilities;</p> <p>4.6 perform main types of woodworking operations with the use of electric hand tool;</p> <p>4.7 perform main types of processing wood and wood materials with hand tool: sawing, drilling, chiseling, planing, grinding;</p> <p>4.8 perform main operations on primary conversion and final Polishing of wood and wood materials with electric hand tool, as well as on woodworking machines: sawing, milling, drilling, sharpening, planing, chiseling, grinding;</p> <p>4.9 follow electrical safety rules during performance of mill work as well as work with furniture;</p> <p>4.10 apply knowledge on electrical technology within the work performed;</p> <p>4.11 apply equipment and tool with electric drive;</p> <p>4.12 use reference materials on electrical technology and electrical equipment;</p> <p>4.13 follow electrical safety rules during performance of mill work as well as work with furniture;</p> <p>4.14 operate electrified equipment for mechanical conversion of wood within the work performed;</p> <p>4.15 eliminate wood faults, processing faults, to sharpen cutting tool;</p> <p>4.16 to eliminate faults, smooth, grind, Polish, peel the surface</p> <p>KNOW</p> <p>4.1 occupational safety rules and production sanitation during performance of mill works;</p> <p>4.2 basics of electrical technology within the work performed;</p> <p>4.3 electrified equipment operation technology for mechanical conversion of wood within the work performed;</p> <p>4.4 main types and structure of hand and electrified machines;</p> <p>4.5 structure, adjustment and operation rules for tool and equipment used in mill works;</p> <p>4.6 main operations on processing of wood and wood materials with hand tool: sawing, drilling, chiseling, planing, grinding;</p> <p>4.7 main operations and techniques of work related to processing of wood and wood materials with electrified tool and on woodworking machines: sawing, milling, drilling, sharpening, planing, chiseling, grinding;</p> <p>4.8 elimination of wood faults, processing defects, sharpening of cutting tool;</p> <p>4.9 electrified equipment operation technique for mechanical conversion of wood within the work performed</p>

Objective:

Provide students with knowledge about the types of wood joints, rules and techniques of performing wood joints when manufacturing wood products. **Tasks:**

Giving an insight into a concept of a component, assembly unit, group. Ensuring acquisition of knowledge of structural components of a product, such as board panel, frame, box, locker, tray-type drawer, small cant, board, panel board. Acquisition of knowledge of various joints applied during production of joinery and furniture products.

Introduction to module:

Module Basic general professional modules.05 Rules and techniques for wood joints when manufacturing wood products is introduced in the structure of the basic professional educational program on a specialty: 1414000 “Furniture manufacturing” (by types) in the course “Basic general professional modules”.

Assimilation of the module is a necessary basis for further studying of the following modules:

BGPM. 03 Rules and techniques for technical measurements in woodworking industry

BGPM. 04 Rules and techniques of working with hand and electrified tool

BGPM. 05 Rules and techniques of performing wood joints in manufacturing wood products

BGPM. 06 Rules and techniques of finishing and facing of joinery and furniture products

BGPM. 07 Rules and techniques of working on woodworking machine

The module includes studying of such disciplines as “Technology of joinery and furniture production”, “Occupational safety”, “Materials science”.

Content of the module:**Section 1.**

Introduction. The concept of component, assembly unit, complex and set. Structural components of joinery products. Types of wood joints. General information on demountable and fixed joints.

Section 2.

Fixed connections and their purpose. Main types of tenons, mortices, lugs, their dimensional interconnection. Tenon, angle joints, T-joints, joints along the length, edge joints. Forming of tenons and lugs. Degree of strength of tenon joints depending on a joint design, rationality of their use. Jointing, strengthening, splicing. Joining of components with the use of nails, screws, key bolts, fixing brackets, strength of joint. Movable rigid demountable joints using couplers and dowels. Types of couplers, their characteristic, application features. Quantity of couplers and dowels per joint, mounting arrangement of additive openings. Demountable movable joints. Types of hinges, their characteristics and field of use. Quantity of hinges per joint. Joints with the help of screws, their purpose, selection of dimensions and quantity of screws. Use of accessories free of screws.

Practical class No. 1. Application examples of and calculation of the basic dimensions of angle T-joints.

Practical class No. 2. Application examples and calculation of basic dimensions of angle edge joints.

Practical class No. 3. Development of technological process for joining of components on key bolts, nails.

Subject of extracurricular independent work: Development of individual project on a subject: “End jointing of ready-to-assemble parts”.

Section 3.

Technological process of gluing: preparation of wood materials for gluing; selection, preparation and putting glue on wood, press fitting of the components exposed to gluing, hardening time of the components glued together after press fitting. Equipment and devices used when gluing. Gluing defects, techniques of their prevention and elimination.

Preparation of workplaces and occupational safety during wood gluing operations.

Practical class No. 4. Preparation of wood glue. Technology of gluing components on edge and sawn face.

Subject of extracurricular independent work: Development of the group project on a subject: “Wood gluing technological process”.

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must know how to
LO 05 perform wood joints when manufacturing joinery and furniture products	5.1 prepare workplace; 5.2 work with reference materials and catalogues; 5.3 professional oriented terminology; 5.4 follow safety rules and occupational sanitation when performing wood joints; 5.5 perform wood joints; 5.6 shape tenons, lugs; 5.7 bend components of joinery and furniture products; 5.8 make wood glues; MUST KNOW: 5.1 occupational safety rules and occupational sanitation when performing joinery works; 5.2 techniques of bending components of joinery and furniture products; 5.3 wood glue preparation techniques; 5.4 wood joinery techniques

BGPM. 06 *Rules and techniques of works on finishing and facing of carpentry and furniture products*

Objective:

To form theoretical and practical knowledge in students about the types of finishing and facing materials, field of use of finishing and facing materials, technology of their application and processing.

Tasks:

To give an insight into the concept of finishing and facing, finishing coat, imitation, drying. To ensure acquisition of knowledge about the need of finishing and facing of joinery and furniture products, about finishing materials application techniques, facing techniques, techniques of coat refinement.

Introduction to module:

BGPM module. 06 “Rules and techniques of finishing and facing joinery and furniture products” is introduced in the structure of the main professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Basic general professional modules”.

Learning of the module is a necessary basis for further studying of the following modules:

Professional module. 01 Manufacturing technology and assembly of samples and accessories

PM. 02 Manufacturing technology and assembly of joinery products

PM .03 Manufacturing technology and assembly of cabinet furniture

PM .04 Manufacturing technology and assembly of structural furniture

PM .05 Manufacturing technology, assembly and upholstery

The module includes studying of such disciplines as “Joinery and furniture production technology”, “Occupational safety”, “Materials science”.

Content of the module:

Section 1.

Introduction.

General information about the purpose of finishing. Types of finishing, depending on the use of finishing materials, technology of their application and processing. Transparent finishing. Field of use of transparent finishing. Varnishing. Main types of varnishes used in varnishing. Waxing as a technique of transparent finishing. Polishing . Protective and decorative transparent coating. Opaque coating, types and field of use. Types of paints and varnish paints for opaque coating. Complete filling of the finished surfaces after laying the first coating. Local filling for smoothing of deep inequality. Use of stencil plates. Grain printing, types and field of use. Application of texture. Grain printing techniques.

Lamination as a type of grain printing.

Practical class No. 1. Creation of a group project on a subject: “Modern finishing of wood products with the use of synthetic man made film-forming agents (dusting, lamination, texturing)”.

Section 2.

Preparation of surface components and products for finishing. Distinctions between preparation for joinery and finishing. Joinery preparation for transparent finishing. Dealing with knots and cracks by hand and on machines. Wood surface smoothing. Grinding by hand, electric grinders and on machines. Joinery preparation for opaque coating. Fin-

ishing preparation for transparent finishing. Removal of pile. Bleaching. Coloring. Tools and devices used for coloring. Laying the first coating and filling. Finishing preparation for opaque coating. Laying the first coating for opaque coatings. Local filling. Application of complete filling. Imitation for transparent finishing. Printing and aerographics (spray printing).

Practical class No. 2. Studying of equipment design for creation of paint-and-lacquer coatings.

Subject of extracurricular independent work. Students are offered to study specialized work tool for surface finishing and to prepare oral report.

Subject of extracurricular independent work. To write an essay on the subject “The main techniques of work and safety rules during finishing works”

Section 3.

Finishing material application techniques. Application of finishing materials with hand tools. Brushes for lacquer (varnish) application. Techniques of varnishing with a brush and pad. Polishing with a pad. Prime coating, creation of a pitch film and removal of oil. Application of finishing materials with hydraulic spraying. Hydraulic spraying technique. Defects arising in case of violation of hydraulic spraying procedure: chagreen leather, uneven thickness of a film, air traps in a coat, skips of finishing material, excess flow. Application of finishing materials in electric field of high voltage. Application of finishing materials by Pouring. Application of finishing materials by dipping and rollers.

Practical class No. 3. Transparent finishing technological process development following Pouring technique.

Practical class No. 4. Transparent finishing technological process development following hydraulic spraying technique.

Practical class No. 5. Transparent finishing technological process development following dipping technique.

Subject of extracurricular independent work: Creation of presentation with the help of computer program (according to preferences) on the subject: “Tools and facilities used in finishing of products”

Section 4.

Drying of coatings, field of use and types. Convective drying, field of use and techniques. Thermoradiation drying: infrared heating, drying by ultra-violet radiation. Drying by the accumulated heat. Refinement of coatings: grinding, smoothing by a pad, Polishing. Technological finishing processes: procedure of finishing operations and technique, tools and equipment, finishing techniques.

Subject of extracurricular independent work: Preparation of a report by the groups and submission of the report as a project on the subject: “Types of drying, field of use”

Section 5.

General concepts about facing. Preparation of a basis for facing. Preparation of veneer sheet for facing. Facing of plates of boards with veneer sheet. Processing and laminating of edges of boards. Facing of curvilinear and shaped components. Facing by laminated paper plastic and laminating.

Practical class No. 5. Preparation of basis for facing.

Subject of extracurricular independent work: Preparation of the report by groups and presentation of the report on the subject: “Facing defects, prevention and elimination”.

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
<p>LO 06: Finish and face joinery and furniture products</p>	<p>BE ABLE TO:</p> <ul style="list-style-type: none"> 6.1 prepare workplace; 6.2 work with reference materials and catalogues; 6.3 know professional oriented terminology; 6.4 follow safety rules and occupational sanitation during finishing and facing works; 6.5 use tool and equipment for finishing and facing of joinery and furniture products during performance of work; 6.6 make compositions of deresinators, bleaches, dyes, Pore fillers, filling paints, base coat and other materials for preparation of component surfaces, joinery and furniture products for finishing and facing; 6.7 prepare paint-and-lacquer materials for transparent, opaque finishing and grain printing of component surfaces, joinery and furniture products; 6.8 prepare components, assembly units and wood products and materials for transparent, opaque and imitation, paint-and-lacquer coatings; 6.9 perform grinding, smoothing, deresinification, bleaching, coloring, Pore filling, filling, laying the first coating of surfaces, application and fixing of texture, intermediate drying, grinding, cleaning 6.10 apply paint-and-lacquer materials on the components, assembly units and wood products and materials by hand, and following techniques of dipping, spraying, Pouring, rolling, flow coating, in the electric field; 6.11 refine paint-and-lacquer coatings: grinding, smoothing, leveling of a paint film, Polishing, matting, refreshing; 6.12 follow processing techniques of finishing, facing and drying; 6.13 check quality of finishing and facing works; 6.14 prepare surfaces for veneer laying, facing with sheet and film materials: grinding, smoothing, leveling, degumming, filling with putty, roughing; 6.15 make veneer facing of components and edges by rubber down, on the pressing machines, in the gluing machine; 6.16 refine wood products and materials after facing. <p>KNOW:</p> <ul style="list-style-type: none"> 6.1 safety rules and occupational sanitation during performance of finishing and facing works; 6.2 structure and operation rules for tool and equipment applied during finishing and facing works; 6.3 composition and preparation techniques of deresinators, bleaches, dyes, Pore fillers, filling, first coat and other materials for preparation of component surface, joinery and furniture products for finishing and facing; 6.4 composition and preparation techniques of paints and varnishes for transparent, opaque finishing and grain printing of component surface, joinery and furniture products; 6.5 technological process of preparation of components, assembly units and wood products for transparent, opaque and imitation paint-and-lacquer coatings: grinding, cleaning, deresinification, bleaching, coloring, Pore filling, filling, laying the first coating of surfaces, application and fixing of texture, intermediate drying, grinding, cleaning; 6.6 techniques of applying paint-and-lacquer materials on the components, assembly units and wood products and materials by hand, techniques of dipping, spraying, Pouring, rolling, flow coating, in the electric field; 6.7 techniques of refinement of paint-and-lacquer coatings: grinding, smoothing, leveling of a paint and varnish film, Polishing, matting, refreshing; 6.8 technological techniques of finishing, facing, drying; Rules for checking quality of finishing works; 6.9. to prepare surfaces for veneer laying, facing with sheet and film materials: grinding, smoothing, leveling, degumming, filling with putty, roughing; 6.10 properties and technical characteristics of veneer, sheet and film facing materials for facing of edges; 6.11 preparation rules for marking and cutting of veneer, sheet and film materials for facing; 6.12 technology of selection and edge gluing, as well as gluing of sheet and film materials; 6.13 technological process of facing components and edges by rubber down, on the pressing machines, in the gluing machines; 6.14 techniques of refining wood products and materials after facing. 6.15 rules for checking quality of finishing and facing works.

BGPM. 07 *Rules and techniques for woodworking machinery*

Objective:

To give students complete idea of the purpose of woodworking equipment, their classification and field of use.

Tasks:

Acquisition of knowledge of the concept “Woodworking Machines”. To give an insight into types of woodworking electrified equipment. Ensuring acquisition of knowledge of the need of using woodworking machines. Studying of a design of machines, material cutting process, processing of rough-edged bar blanks, processing of dimension blanks.

Introduction to module:

BPM module. 07 “Rules and working techniques on the woodworking equipment” is introduced in the structure of the main professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Basic general professional modules”.

Degree of being familiar with the module is a necessary basis for further studying of the following modules:

PM.01 Manufacturing technology and assembly of samples and facilities

PM.02 Manufacturing technology and assembly of joinery products

PM.03 Manufacturing technology and assembly of cabinet furniture

PM.04 Manufacturing technology and assembly of structural furniture

PM.05 Manufacturing technology, assembly and upholstery

PM.06 Designing of joinery and furniture products using software.

PM.12 Organization of works on safety rules and occupational safety on sites and in woodworking shops and furniture enterprises.

The module includes studying of such disciplines as “Electrical technology”, “Joinery and furniture production technology”, “Occupational safety”.

Content of the module:

Section 1.

Introduction.

General information about machines. Classification of machines by the following features: purpose, the kind of relative movement of the processed ready-to-assemble parts and cutting tool, the degree of mechanization and automation, quantity of working spindles, technological feature of the works performed. Marking of machines. Components of machines: main and auxiliary. Movement, transmission and operating mechanisms. Structure of machines.

Section 2.

Circular saw machines for cross and length cutting. Types of machines. Planer-type milling machine: surfacing, thickness planing machine and four cutting machine. Machines with manual and mechanical feed. Working procedure on machines. Checking of processing quality. Milling machines: purpose of the machine and field of use. Single-spindle-moulding machines with mechanical feed. Tenon cutting machines: single ended and double ended. Purpose and field of use of tenon cutting machine. Slot-boring machine: single or multiple-spindle, horizontal and vertical. Purpose and field of use of machines. Application of the chain morticing machines for selection of mortice rectangular-sectioned components. Grinding ma-

chines. Lathes. Rules and techniques of using combined machines.

Practical class No. 1. Mechanized wood working. Production of ready-to-assemble parts and simple components on woodworking machines.

Practical class No. 2. General characteristic and providing an insight into wood materials machine processing.

Practical class No. 3. Studying of surfacing machine designs.

Practical class No. 4. Studying of milling machine designs.

Subject of extracurricular independent work. Finding of additional information in media and Internet sources on the subject: “Use of combined machines”

Subject of extracurricular independent work. Writing of the reflexive essay on the subject: “Structure and working techniques on slot-boring machines”.

Section 3.

Processing centers: general information and field of use. Numerically controlled machines (NCM). Types, differences, functionality. Operational characteristics of Numerically controlled machines. Benefits of using numerically controlled machines. Safety rules when working on woodworking machines.

Subject of extracurricular independent work. To prepare test questions on the subject: “Safety rules when working on woodworking machines”.

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
LO 07: Use woodworking equipment	<p>BE ABLE TO:</p> <p>7.1 prepare workplace; 7.2 work with reference materials and catalogues; 7.3 know professional oriented terminology; 7.4 follow safety rules and occupational sanitation during work on wood-working equipment; 7.5 use in work woodworking equipment during production of joinery and furniture products; 7.6 use woodworking machines, equipment and tool with the electric drive; 7.7 fix and use machines, tool and equipment for performance of joinery works; 7.8 execute main operations on primary conversion and final Polishing of wood and wood materials on woodworking machines: sawing, milling, drilling, sharpening, planing, chiseling, grinding; 7.9 define main types of alternating current motor working operations.</p> <p>KNOW:</p> <p>7.1 occupational safety rules and production sanitation when performing finishing works; 7.2 structure, rules for correct adjustment and operation of the machines used in joinery works; 7.3 main operations and techniques of processing wood and wood materials on woodworking machines: sawing, milling, drilling, sharpening, planing, chiseling, grinding; 7.4 electrical safety rules during joinery works as well as works with furniture</p>

BGPM. 08 *Selection and use of fasteners, fittings, accessories and auxiliary materials for the production of joinery and furniture products*

Objective:

To form theoretical and practical knowledge in students about types, selection and application of fasteners, fittings, accessories and auxiliary materials for production of joinery and furniture products

Tasks:

To give an insight into the types of furniture fittings, field of use and purpose.

To study the need of use of glass and mirrors during production of joinery and furniture products. To provide acquisition of knowledge of use of plastic, metals and other materials during production of joinery and furniture products. To give an insight into a concept of fasteners and metalware and field of their use.

Introduction to:

BGPM module. 08 “Selection and use of fasteners, fittings, accessories and auxiliary materials for production of joinery and furniture products” is introduced in the structure of the basic professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Basic general professional modules”.

Assimilation of the module is a necessary basis for further studying of the following modules:

PM.01 Manufacturing technology and assembly of samples and fixtures

PM.02 Manufacturing technology and assembly of joinery products

PM.03 Manufacturing technology and assembly of cabinet furniture

PM.04 Manufacturing technology and assembly of structural furniture

PM.05 Manufacturing technology, assembly and upholstery

PM.07 Development and organization of technological production process for joinery and furniture products.

The module includes studying of such disciplines as “Joinery and furniture production technology”, “Occupational safety”, “Materials science”.

Content of the module: Section 1.

Introduction. Use of accessories when assembling components and furniture products. Front and fixing accessories. Knobs, threaded fittings, keys, card loops hinges as types of front fitting. Fixing accessories: hinges, couplers, locks, latches, coupling elements and fasteners, guide rails, transformation mechanisms, containers, holders, support units, support hangers. A concept about metalware and fasteners in furniture production. Field of their application.

Subject of extracurricular independent work. To prepare group project on the subject: “Production of furniture components taking into account quality and labor productivity”

Section 2.

Mountings and products for windows and doors. Window and door accessories:

hinges, handles, locks and also locking and auxiliary mountings and products. Application of window and door hinges. Handles for windows and doors. Door locks. Mountings for windows and locking doors. Auxiliary mountings and products for windows and doors. Application of metal frameworks when manufacturing joinery

and furniture products.

Practical class No. 1. To study components of window and door unit. *Subject of extracurricular independent work.* To prepare written report on the subject: “Types of auxiliary accessories and products for windows and doors”.

Section 3.

Transparent, Polished, tinted, different types of decorative glass, also mirror in production of furniture and joinery and construction products. Field of use of mat- ted glass. Pebbled glass: transparent and opaque. Sheet patterned glass. Color glass: types and field of use. Show-window glass. Furniture mirrors: types and purpose. Use of plastic and synthetic facing materials in production of furniture and joinery and construction products.

Practical class No. 2. Studying of the field of synthetic facing materials in wood-working.

Practical class No. 3. To study field of use of natural and man made stones in production of furniture and joinery and construction products.

Subject of extracurricular independent work. To prepare reflexive essay on the subject: “Excentric couplers”

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
LO 08: Use fasteners, fittings, accessories and auxiliary materials in production of joinery and furniture products	BE ABLE TO: 8.1 prepare workplace; 8.2 work with reference materials and catalogues; 8.3 know professional oriented terminology; 8.4 follow safety rules and occupational sanitation ; 8.5 install fixing accessories, fittings, glass products, mirrors on joinery and furniture products; 8.6 define species of wood, sort wood by defects, it is rational to use it in production of joinery and furniture products; 8.7 select and use in work fasteners, fittings, accessories, glass products, mirrors and other auxiliary materials; 8.8 install mounting fittings and accessories; KNOW: 8.1 occupational safety rules and production sanitation; 8.2 Installation techniques for fixing accessories, fittings, glass products, mirrors on joinery and furniture products; 8.3 physical, chemical and mechanical properties, specific application in production of joinery and furniture products; 8.4 specific features and assortment of fasteners, fittings, accessories, glass products, mirrors and other auxiliary materials 8.5 techniques of installation of fixing fittings and accessories;

PM.00 Professional modules

PM.01 *Manufacturing technology and assembly of templates and appliances*

Objective:

Acquisition of skills of choosing and cutting of ready-to-assemble parts, mechanical conversion and assembly of components of the models and fixtures intend-ed for production of joinery and furniture products.

Objective:

To perform finishing of models and fixtures. To conduct technological testing, maintenance, their storage and repair. To design models and fixtures for production of joinery and furniture products

Introduction to module:

PM Module. 01 Technology and assembly of models and fixtures is a basic initial professional level and is introduced in the structure of the main professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Professional Modules”.

For assimilation of the module students use knowledge, abilities, skills formed during studying of manufacturing techniques and assembly of models and fixtures for basic vocational education.

Assimilation the module is a necessary basis for further studying of professional modules:

PM.02 Manufacturing technology and assembly of joinery products

PM.03 Manufacturing technology and assembly of cabinet furniture

PM.04 Manufacturing technology and assembly of structural furniture

PM.05 Manufacturing technology, assembly and upholstery

PM.06 Development and organization of fabrication production process of joinery and furniture products.

Content of the module:**Section 1.**

Graphic design of drawings, models and fixtures according to unified system for design documentation. Manual and electrified tool kits. Classification of models and fixtures by types and purpose. Materials applied for production of models and fixtures. Characteristics of materials and properties. Safety rules and production sanitation in manufacturing facilities.

Manufacturing technology for models and fixtures. Types of models and their field of use.

Subject of extracurricular independent work: Solving of theoretical tasks by calculations of the matching joints and connection joints applied when designing models and fixtures.

Section 2.

Finishing of models and fixtures. Conducting of technological testing, maintenance, storage and repair.

Designing of models and fixtures for production of joinery and furniture products.

Selection of required materials for production of models and fixtures.

Corrective adjustment and operation of machines, equipment and hand tools for production of models and fixtures.

Practical class No. 1. Selection and cutting of ready-to-assemble parts, mechanical conversion and assembly of components of the models and fixtures intended for production of joinery and furniture products.

Section 3.

Performance of production tasks on cutting of ready-to-assemble parts, mechanical conversion and assembly of components of models and fixtures. Techniques of controlling quality of production of sample components and fixtures at all stages of

technological process.

Techniques of finishing of models and fixtures. Techniques of conducting technological testing, maintenance, storage and repair of models and fixtures.

Corrective adjustment of techniques, working techniques on machines, working techniques with hand tools for production of models and fixtures.

Practical class No. 2 . Reading of drawings. Selection of necessary materials for manufacturing of models and fixtures. Designing of drawings of models and fixtures using software

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
<p>LO 1: Design, manufacture and collect models and fixtures for manufacturing joinery and furniture products</p>	<p>BE ABLE TO:</p> <p>1.1 prepare workplace; 1.2 work with reference materials and catalogues; 1.3 know professional oriented terminology; 1.4 have skills of reading technical drawings, models, fixtures; 1.5 follow safety rules and production sanitation in manufacturing facilities;</p> <p>1.6 make corrective adjustment and use machines, tool and equipment for production of models in work; 1.7 select required materials for production of models and fixtures; 1.8 mark up ready-to-assemble parts for components, models and fixtures; 1.9 cut ready-to-assemble parts for components of models and fixtures; 1.10 perform mechanical conversion of ready-to-assemble parts for components of models and fixtures; 1.11 join components of models and fixtures; 1.12 install fittings and accessories on models and fixtures. 1.13 finish models and fixtures 1.14 conduct technological testing of models and fixtures; 1.15 provide technical maintenance, check and repair models and fixtures; 1.16 classify models and fixtures by the form and purpose; 1.17 develop designs of models and fixtures; 1.18 control quality of models and fixtures at all manufacturing stages;</p> <p>KNOW</p> <p>1.1 occupational safety rules and production sanitation in manufacturing facilities on production of models and fixtures; 1.2 structure, rules of corrective adjustment and operation of machines, tool and equipment for production of models and fixtures; 1.3 classification of models and fixtures for production of joinery and furniture products by the form and purpose; 1.4 characteristics of the materials applied for production of models and fixtures; 1.5 techniques of marking ready-to-assemble parts for components of models and fixtures 1.6 techniques of cutting ready-to-assemble parts for components of models and fixtures; 1.7 techniques of mechanical conversion of ready-to-assemble parts for components of models and fixtures; 1.8 techniques of jointing components of models and fixtures; 1.9 techniques of installation of fitting and accessories on models and fixtures; 1.10 techniques of finishing of models and fixtures; procedure and rules for technological testing of models and fixtures; 1.11 procedure and rules of technical maintenance, check and repair of models and fixtures; 1.12 techniques of development of designs of models and fixtures for production of joinery and furniture products; 1.13 techniques and methods of controlling quality of models and fixtures at all manufacturing stages</p>

PM. 02 *Manufacturing technology and assembly of joinery*

Objective:

Acquisition of skills on choosing and cutting of ready-to-assemble products, mechanical conversion and assembly of joinery products.

Tasks:

To perform operations of finishing of components and joinery products. To perform operations on packaging and storage of joinery products. Designing of joinery products.

Introduction to module:

“Manufacturing technology and assembly of joinery products”, is a professional level and is introduced in the structure of the main professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Professional Modules”.

For assimilation of the module students use knowledge, abilities, skills formed during studying of manufacturing technology and assembly of joinery products for basic vocational education degree.

Learning of the module is a necessary basis for further studying of professional modules:

PM.07 “Development and organization of technological production process related to joinery and furniture products”,

Content of the module:

Section 1.

Graphic design of drawings for joinery products according to Unified System for Design Documentation. Set of manual and electric hand tools. Classification of joinery products by types and purpose. Materials applied for production of joinery products. Characteristics of materials and properties. Safety rules and production sanitation in manufacturing facilities. Joinery products manufacturing technology.

Section 2.

Corrective adjustment and operation of machines, equipment and hand tools for production of joinery products.

Constructional design of joinery products. Selection of required materials, front and fixing accessories for production of joinery products. Choosing, cutting and mechanical conversion. Assembly of joinery products.

Practical class No.1. Finishing of joinery products. Techniques and methods of packaging. Storage precautions of joinery products.

Section 3.

Construction designing of joinery products using software. Reading of drawings. Selection of required materials, front and fixing accessories for production of joinery products.

Fulfillment of production assignments on cutting of ready-to-assemble parts, mechanical conversion, finishing and assembly of joinery products. Fulfillment of production assignments on controlling the quality of manufacturing of components and joinery products at all stages of technological process.

Joinery products finishing techniques. Packaging methods and techniques.

Practical class No.2. Techniques of corrective adjustment, working techniques

on machines, working techniques with hand tools for production of joinery products.

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
LO 2: Manufacture and assemble joinery products	BE ABLE TO: 2.1 prepare workplace; 2.2 work with reference materials and catalogues; 2.3 know professional oriented terminology; 2.4 have skills of reading technical drawings of joinery products; 2.5 follow safety rules and production sanitation rules in manufacturing facilities. 2.6 adjust and use machines, tool and equipment in work for production of joinery products. 2.7 select required materials for production of joinery products. 2.8 cut ready-to-assemble parts for production of joinery products; 2.9 perform mechanical conversion of ready-to-assemble parts for production of joinery products; 2.10 join components of joinery products; 2.11 finish components of joinery products; 2.12. install fixing and front accessories on joinery products. 2.13 install glass units on joinery products; 2.14 package joinery products; 2.15 develop designs of joinery products; 2.16 to control quality of joinery products at all manufacturing stages. KNOW 2.1 occupational safety rules and production sanitation in manufacturing facilities on production of cabinet furniture products; 2.2 structure, rules of corrective adjustment and operation of machines, tool and equipment for production of joinery products; 2.3 characteristics of materials used for production of joinery products; 2.4 techniques of cutting ready-to-assemble parts for joinery products; 2.5 techniques of mechanical conversion of ready-to-assemble parts for joinery products; 2.6 techniques of finishing components and joinery products; 2.7 techniques of assembling joinery products; 2.8 installation techniques for fixing and front accessories; 2.9 techniques of installation of glass elements on joinery products; 2.10 techniques and methods of packaging joinery products and their components; 2.11 techniques and methods of development of designs for joinery products; 2.12 techniques and methods of controlling quality of joinery products at all manufacturing stages

PM. 03 *Manufacturing technology and assembly of cabinet furniture*

Objective:

Acquisition of skills of selecting and cutting of ready-to-assemble parts, mechanical conversion and assembly of cabinet furniture products.

Tasks:

To perform operations of finishing components and products of cabinet furniture.
 To perform operations on packaging and storage of joinery products. Designing of cabinet furniture products.

Introduction to module:

PM Module.03 “Manufacturing technology and assembly of cabinet furniture” is a professional level and is introduced in the structure of the main professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in

the course “Professional Modules”.

For assimilation of the module students use knowledge, abilities, skills formed during studying of manufacturing technology and assembly of cabinet furniture for vocational education.

Assimilation of the module is a necessary basis for further studying of professional modules:

PM. 05 “Manufacturing technology, assembly and upholstery”.

PM. 07 “Development and organization of technological production process of joinery and furniture products”.

Content of the module:

Section 1.

Graphic design of drawings for cabinet furniture products according to Unified System for Design Documentation. Set of manual and electric hand tools. Classification of joinery products by types and purpose. Materials applied for production of cabinet furniture. Characteristics of materials and properties. Safety rules and production sanitation in manufacturing facilities. Manufacturing technology of cabinet furniture.

Section 2.

Constructional design of joinery products. Selection of required materials, front and fixing accessories for production of cabinet furniture. Selection, cutting and mechanical conversion. Finishing of components and assembly of cabinet furniture.

Corrective adjustment and use of machines, equipment and hand tools for manufacturing of cabinet furniture.

Practical class No. 1. Finishing of cabinet furniture. Techniques and methods of packaging. Cabinet furniture storage precautions.

Section 3.

Designing of cabinet furniture products using software. Reading of drawings. Selection of required materials, front and fixing accessories for production of cabinet furniture. Techniques of finishing cabinet furniture. Techniques and methods of packaging.

Corrective adjustment techniques, techniques of working on machines, techniques of working with hand tools for production of cabinet furniture.

Practical class No. 2. Fulfillment of production assignments on cutting of ready-to-assemble parts, mechanical conversion, facing, finishing and assembly of cabinet furniture.

Practical class No. 3. Fulfillment of production assignments on controlling the quality of manufacturing of components and cabinet furniture products at all stages of technological process.

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
LO 3: Manufacture and assemble cabinet furniture	BE ABLE TO: 3.1 prepare workplace; 3.2 work with reference materials and catalogues; 3.3 know professional oriented terminology; 3.4 have skills of reading technical drawings of cabinet furniture products; 3.5 follow safety regulations and production sanitation in manufacturing facilities; 3.6 adjust and use machines, tool and equipment in work for production of cabinet furniture; 3.7 select required materials for production of cabinet furniture; 3.8 cut ready-to-assemble parts for production of cabinet furniture; 3.9 perform mechanical conversion of ready-to-assemble parts for production of cabinet furniture; 3.10 join cabinet furniture components; 3.11 finish cabinet furniture components; 3.12. face cabinet furniture products and components. 3.13 install fixing and front accessories on cabinet furniture products 3.14 install glass units on cabinet furniture products; 3.15 package cabinet furniture products and components; 3.16 develop designs of cabinet furniture products; 3.17 control quality of cabinet furniture at all manufacturing stages. KNOW 3.1 occupational safety rules and production sanitation in manufacturing facilities on production of cabinet furniture products; 3.2 structure, rules of corrective adjustment and operation of machines, tool and equipment for production of joinery products; 3.3 characteristics of materials used for production of cabinet furniture products; 3.4 techniques of cutting ready-to-assemble parts for cabinet furniture products; 3.5 techniques of mechanical conversion of ready-to-assemble parts for cabinet furniture products; 3.6 techniques of finishing components and cabinet furniture products; 3.7 techniques of assembling cabinet furniture components; 3.8 installation techniques for fixing and front accessories; 3.9 techniques of installation of glass elements on cabinet furniture products; 3.10 techniques and methods of packaging cabinet furniture products and components; 3.11 techniques and methods of development of designs for cabinet furniture products; 3.12 techniques and methods of controlling quality of cabinet furniture at all manufacturing stages

PM. 04 Manufacturing technology and assembly of structural furniture

Objective:

Acquisition of skills of selecting and cutting ready-to-assemble parts, mechanical conversion and assembly of structural furniture products.

Tasks:

To perform operations of finishing structural furniture components and products.
 To perform operations on packaging of structural furniture. Studying of structural furniture storage precautions. Designing of structural furniture products.

Introduction to module:

PM Module.04 “Manufacturing technology and assembly of structural furniture” is a professional level and is introduced in the structure of the main professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Professional Modules”.

For assimilation of the module students use knowledge, abilities, skills formed during studying technology of manufacturing and assembly of structural furniture for vocational education.

Learning of the module is a necessary basis for further studying of professional modules:

PM. 05 “Manufacturing technology, assembly and upholstery”.

PM. 07 “Development and organization of technological production process of joinery and furniture products”.

Content of the module:

Section 1.

Graphic design of drawings for structural furniture products according to Unified System for Design Documentation. Set of manual and electric hand tools. Classification of structural furniture by types and purpose. Materials applied for production of structural furniture. Characteristics of materials and properties. Safety rules and production sanitation in manufacturing facilities. Structural furniture manufacturing technology.

Section 2.

Constructional design of structural furniture products. Selection of required materials, front and fixing accessories for production of structural furniture. Selection, cutting and mechanical conversion of ready-to-assemble parts. Assembly of structural furniture.

Corrective adjustment and use of machines, equipment and hand tools for manufacturing of cabinet furniture.

Practical class No. 1. Finishing of structural furniture. Techniques and methods of packaging. Structural furniture storage precautions.

Practical class No. 2. Corrective adjustment and operation of machines, equipment and hand tools for production of structural furniture.

Section 3.

Designing of structural furniture products using software. Reading of drawings. Selection of required materials, front and fixing accessories for production of structural furniture. Structural furniture finishing techniques. Techniques and methods of packaging. Equipment corrective adjustment techniques, techniques of working on machines, techniques of working with hand tools for production of structural furniture.

Practical class No. 3. Fulfillment of production assignments on cutting of ready-to-assemble parts, mechanical conversion, finishing and assembly of structural furniture products.

Practical class No. 4. Fulfillment of production assignments on controlling quality of manufacturing of components and structural furniture products at all stages of technological process.

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
LO 4: Manufacture and assemble structural furniture	<p>BE ABLE TO:</p> <p>4.1 prepare workplace; 4.2 work with reference materials and catalogues; 4.3 know professional oriented terminology; 4.4 have skills of reading technical drawings related to structural furniture products; 4.5 follow safety regulations and production sanitation in manufacturing facilities; 4.6 adjust and use machines, tool and equipment in work for production of structural furniture; 4.7 select required materials for production of structural furniture; 4.8 cut ready-to-assemble parts for production of structural furniture; 4.9 perform mechanical conversion of ready-to-assemble parts for production of structural furniture; 4.10 join structural furniture components; 4.11 finish structural furniture components; 4.12 install fixing and front accessories on structural furniture products 4.13 package structural furniture products and components; 4.14 develop designs of structural furniture products; 4.15 control quality of structural furniture at all manufacturing stages.</p> <p>KNOW</p> <p>4.1 occupational safety rules and production sanitation in manufacturing facilities on production of structural furniture products; 4.2 structure, rules of corrective adjustment and operation of machines, tool and equipment for production of structural furniture products; 4.3 characteristics of materials used for production of structural furniture products; 4.4 techniques of cutting ready-to-assemble parts for structural furniture products; 4.5 techniques of mechanical conversion of ready-to-assemble parts for cabinet furniture products; 4.6 techniques of finishing structural furniture components and products; 4.7 techniques of assembling structural furniture components, products; 4.8 fixing and front accessories installation techniques; 4.9 techniques and methods of packaging structural furniture products and components; 4.10 techniques and methods of development of designs for structural furniture products; 4.11 techniques and methods of controlling quality of structural furniture at all manufacturing stages</p>

PM.05 *Manufacturing technology, assembly and upholstering of soft furniture*

Objective:

Acquisition of skills of selecting and cutting facing and flooring materials. Acquisition of skills on fabrication of covers.

Tasks:

To perform operations of upholstery of soft furniture components and products. To perform operations on soft furniture packaging. To perform operations on repair and refinishing of soft furniture. Designing of soft furniture products. Reading of soft furniture drawings.

Introduction to module:

PM Module.04 “Manufacturing technology and assembly and upholstery of soft

furniture” is a professional level and is introduced in the structure of the main professional educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Professional Modules”.

For assimilation of the module students use knowledge, abilities, skills formed during studying technology of manufacturing and assembly and upholstery of soft furniture for vocational education.

Learning of the module is a necessary basis for further studying of professional modules:

PM. 07 “Development and organization of technological production process of joinery and furniture products”.

Content of the module:

Section 1.

Graphic design of drawings for soft furniture products according to Unified System for Design Documentation. Set of manual and electric hand tools. Classification of soft furniture by types and purpose. Techniques of cutting and sewing soft elements and covers. Types of spring elements of upholstered furniture. Safety and production sanitation rules in manufacturing facilities. Soft furniture manufacturing, upholstering and assembling technology.

Section 2.

Creation of sketches and reading of soft furniture drawings. Selection of required materials, front and fixing accessories for production of soft furniture. Techniques and methods of packaging.

Corrective adjustment and use of machines, equipment and hand tools for manufacturing, repair and refinishing of soft furniture.

Practical class No. 1. Selection, cutting of covering and flooring materials, fabrication of covers. Assembly of frameworks and upholstery of soft furniture components and products.

Practical class No. 2. Techniques and techniques of repairing and refinishing soft furniture.

Section 3.

Designing of soft furniture products using software. Reading of drawings. Selection of required materials, front and fixing accessories for production of soft furniture. Assembly of supporting structures, fixing of flooring and spring components, fabrication of covers, upholstery of soft furniture.

Fulfillment of production assignments on controlling production quality of soft furniture components and products at all stages of technological process. Corrective adjustment techniques, techniques of working on machines, techniques of working with hand tools for production, repair and refinishing of soft furniture.

Practical class No. 3. Fulfillment of production assignments on cutting of covering and flooring materials, fabrication of soft furniture covers.

Practical class No. 4. Techniques and methods of upholstering. Techniques and methods of packaging.

Learning outcomes after successful completion of this module the learner must	Assessment criteria The learner must
LO 5: Manufacture, assemble and upholster soft furniture	BE ABLE TO: 4.1 prepare workplace; 5.2 work with reference materials and catalogues; 5.3 know professional oriented terminology; 5.4 have skills of reading technical drawings related to soft furniture products; 5.5 follow safety regulations and production sanitation in manufacturing facilities; 5.6 adjust and use machines, tool and equipment in work for production of soft furniture; 5.7 select required materials for production of soft furniture; 5.8 cut covering and flooring materials; 5.9 fabricate covers of soft furniture; 5.10 assemble soft furniture supporting structures; 5.11 perform operations of gluing and fixing of soft furniture flooring components; 5.12 upholster soft furniture components and products 5.13 install fixing and front accessories on soft furniture products; 5.14 package soft furniture components and products 5.15 develop designs of soft furniture products; 5.16 have skills of repairing and refinishing of soft furniture KNOW 5.1 occupational safety rules and production sanitation in manufacturing facilities on production of soft furniture products; 5.2 structure, rules of corrective adjustment and operation of machines, tool and equipment for production of soft furniture products; 5.3 characteristics of materials used for production of soft furniture products; 5.4 techniques of cutting ready-to-assemble parts for soft furniture products; 5.5 techniques and methods of fabrication of covers for soft furniture products; 5.6 rules and techniques of assembling soft furniture supporting structures; 5.7 techniques of installation of fixing and front accessories; 5.8 techniques and techniques of repairing and refinishing of soft furniture; 5.9 techniques and methods of packaging soft furniture components and products; 5.10 Techniques and methods of development of soft furniture products designs 5.11. techniques and methods of controlling quality of soft furniture at all manufacturing stages

PM.06 Design and construction of joinery and furniture products using software

Objective:

To provide students with knowledge of development of structural models of joinery and furniture products using computer-aided design system, to develop, read and execute technical documentation on a product, to perform graphic works with the help of computer-aided design system.

Tasks:

Studying of designing rules, design basis of joinery and furniture products; techniques, as well as organization and theories of designing joinery and furniture products having necessary properties and qualities; acquisition of knowledge of pro-

gressive techniques and means of performing project construction works.

Introduction to module:

PM module. 06 “Designing of joinery and furniture products using software” is introduced in the structure of educational program on the specialty 1414000 “Furniture manufacturing (by types)” in the course “Professional Modules” in the course “Professional Modules for “Technician-technologist” qualification.

Assimilation of the professional module is based on knowledge of disciplines of “Engineering drawing”, “Basic facts about wood”, “Materials science”, “Fundamentals of standardization, certification and metrology”, “Furniture designs calculation bases”, “Technology and organization of furniture production”

Assimilation of the module is a necessary basis for further studying of the following professional modules:

PM. 07 Development and organization of technological production process of joinery and furniture products

PM.08 Performing calculations on consumption of raw materials, materials, equipment in production of joinery and furniture products

PM. 09 Fundamentals of production economics at woodworking enterprise

PM. 10 Designing of sites and shops of woodworking and furniture enterprises.

Content of the module:

Section 1. Products made from wood and wood materials

General information about wood products

Classification of products made from wood and wood materials, their purpose. Materials used in production of products made from wood and wood materials. Features of designing connected with properties of wood.

Joints in wood products

Classification of joints. Fixed joints and their purpose. Main types of tenons, mortices, lugs, their dimensional interrelation. Mortice, angle joints, T-joints, length-wise joints, edge joints. Degree of strength of tenon joints depending on the design of the joint, rationality of their use. Facing. Jointing with nails, fixing brackets, joint efficiency. Demountable movable joints with couplers and dowels. Types of couplers, their characteristic, field of application. Quantity of couplers and dowels per joint, mounting arrangement of additional openings. Demountable movable joints. Types of hinges, their characteristics and field of use. Quantity of hinges per joint. Jointing using screws, their purpose, selection of the dimensions and quantity of screws. Use of free of screw accessories.

Designs of components and assembly units of wood products.

Design features of details and assembly units in woodworking industry. Designs of details made from solid wood, rectilinear and curvilinear; bent, curved laminated wood parts and sawing parts. Parts made from glass, metal, polymeric materials. Assembly units which are a part of products –framework, boxes, lockers, semi-boxes, supporting units. Designs of different types of plate boards.

Fits and adjustments in woodworking

Substitution objects (assembly units, components, etc.). Basic concepts about fits and adjustments in wood products. Nominal, actual and limiting dimensions. Deviations. Fits. Dimensional limits. Adjustment as a functional characteristic of jointing. Dimensions of the joint components defining adjustments.

Surface roughness

Parameters and characteristics of roughness. Measurement and control of surface roughness. General requirements to surface roughness, surface roughness parameters. Value of roughness parameters and setting of standards in designing of joinery and furniture products. Designation of roughness and rule of drawing them on drawings

JOINERY AND CONSTRUCTION PRODUCTS

Types of products, design of parquet, partitions.

Main types of joinery and construction products (windows, doors, gates, wood trims, window boards). Materials applied for production of joinery and construction products. Types and designs of panels, parquet. Designs of joinery partitions.

Designs of door units.

Classification of door units, design features and materials for their production. Basic elements of doors. Requirements to doors. Design features of various types of doors.

Designs of window blocks.

Classification of windows and balcony doors, features of a design and materials for their production. Basic components of windows and balcony doors. Requirements to windows and balcony doors. Basic materials in production of windows and balcony doors.

FURNITURE PRODUCTS

Classification of furniture. Styles of furniture.

Classification of furniture products by functional, operational purpose, by types of material, by constructive and technological characteristics. Main features of styles of architecture and furniture. Modern furniture and tendencies of their style formation. Main trends of improving variety of household furniture.

Designs of furniture products

Components of a cabinet product. Characteristic of forming schemes of the body. Design and techniques of installation of doors, shelves, boxes, supporting components, mirrors, fixing and front accessories. Industry based system of unification of cabinet products. Dimensions of the panel board elements forming cabinet furniture products.

Features of designing of cabinet furniture, Functional dimensions of writing desks and dining tables. Characteristic, key components of tables and techniques of jointing. Designs of one pedestal and two-pedestal desks. Designs of dining tables, techniques of their transformation. Designs of kitchen tables.

Basic components of chairs and joining techniques. Functional dimensions of chairs. Requirements imposed to materials and quality of finished products. Designs of joinery, bent, glued chairs, chairs of the composite design.

Basic structural parts of upholstered furniture: basic units, tough part, floorings, cover fabrics and their purpose. Assembly of upholstered furniture products. Indicators of softness of furniture components. Requirements to soft components.

Designing of beds, chairs, sofa beds.

Designing technique related to wood products.

Design stages and their content

Designing features of joinery and furniture products. Project development stages, content and work stages : technical specification, technical proposal, draft sketch, technical design, product design documentation. Organizational forms and features

of project activities.

Bases of art designing of wood products

Calculation techniques and basic rules of designing products. Computer-aided design system intended for products. Ergonomic, constructive, production requirements to furniture and joinery products. Aesthetic aspects of designing of products (form and design of products, color in furniture and interior).

Development of operational design documentation

Types of design documents: graphic and text. Types of drawings (assembly drawing, component drawing, dimensional drawing, assembly drawing, architectural drawing, interior drawing). Text documents (technical product description, specifications), drafting rules

Subject of extracurricular independent work:

To prepare presentation on a subject:

“Materials applied in production of products made from wood and wood materials”.

“Joints in wood products”.

“Joinery and construction products”.

“Classification of furniture. Styles of furniture”.

Section 2.

Bases of designing joinery and furniture products. Manufacturing technology of joinery and furniture products. Materials and accessories for production of joinery and furniture products. List of materials (wood, polymeric, metal, gluing, finishing, impregnating, facing) and component parts.

Quality of processing, basic concepts. Processing accuracy. Replaceability. Control and measuring tools (calibers).

Use of graphical programs in woodworking industry.

Development of design documentation for joinery products. Execution rules for design documentation (drawings, specifications, text documents and main texts) according to unified design documentation system. Product technical description.

Designing of furniture with standard tools. Special programs: bCAD program, BAZIS, “Astra Constructor Mebeli”. Automation of joinery and furniture production.

Practical class No. 1. Constructional and technological design bases for joinery and furniture products.

Practical class No. 2. Calculation and drawing of angle, edge, T-joints, angle box joints.

Practical class No. 3. Control of details processing accuracy with measuring tool (tape measure, folding ruler, angle piece, miter square, etc.), calibers.

Practical class No. 4. Drawing up a scheme of technological production process for joinery and furniture product

Practical class No. 5. Joining, binding, joining of details with nails, screws, bolts, couplers, hairpins, dowel pins, gluing.

Practical class No. 6. Calculation and experimental determination of fixity and durability of structural components of joinery products.

Practical class No. 7. Selection and installation of fittings, accessories.

Subject of extracurricular independent work:

1. Study of bending characteristics of constructional materials of joinery products.

2. Determination of dimensions of elements and components of joining of joinery products taking into account durability indicators.
3. Definition of endurance limit of laminated glue joints at a static bending.
4. Study of permissible load and impacts on elements and details of joinery products.
5. Study of mechanical indicators of joints of joinery products.
6. Study of changes in the dimensions and form of components of joinery products under the exposure of loadings and influences.
7. Research of thermal resistance of window block components.

Section 3.

Setting of drawing parameters in the AutoCAD program. Studying of toolbars. Creation of text styles

Creation and editing of tables. Creation of a product drawing. Dimensioning and inscriptions on the drawing

Development of project, design and text documentation in computer-aided design system. Drawing creation techniques : parametrical, nonparametric (sketch design), automatic parametrization. Basic principles and concepts of three-dimensional modeling. Techniques of creation of three-dimensional models: “Drawing plane-sketch design-Model”, “From 2D to 3D”. Creation of assembly models. Design of assembled parts “from top to down”. Automated tools for preparation of specifications and other text documentation in computer-aided design system.

Computer modeling of joinery products. Types of mathematical models and requirements to them in computer-aided design system. Calculation technique and modeling of joinery products and their structural components. Approximate techniques of problem solving. Finite-element technique. Basic principles of calculation following finite-element technique. Rules for creation of calculation model and splitting them into finite elements.

Editing model. Formation of drawings

Design of different types of products (cupboards, dressers, kitchen cupboards, written desks and computer tables, corner cupboards)

Subject of extracurricular independent work:

Creation of projects of different types of products (cases, dressers, buffets, written desks and computer tables, angular cases).

Practical class No. 8. Development of the sketch design of a product following three-dimensional models in computer-aided design system.

Practical class No. 9. Creation of types, sections and cuts on the basis of three-dimensional model of a product in computer-aided design system.

Practical class No. 10. Development of assembly drawing and assembly scheme on the basis of three-dimensional model for a product in computer-aided design system.

Practical class No. 11. Creation of a specification for a product in computer-aided design system.

Practical class No. 12. Development of working drawings of components on the basis of their three-dimensional model in computer-aided design system.

Practical No. 13. Development of technological production process for components and assembly of a veneer door.

Practical No. 14. Development of technological assembly process for a paneled door.

Practical No. 15. Development of technological assembly process for window block with separate covers.

Practical No. 16. Definition of a product style and elements of product decoration.

Practical No. 17. Definition of design solutions of cabinet furniture elements following the samples.

Practical No. 18. Development of a cabinet construction taking into account functional drawers.

Practical No. 19. Development of construction of a product with mirror taking into account functional drawers and development of construction of pier-glass tables.

Practical No. 20. Development of construction of floor and wall hanging kitchen cupboards taking into account mating parts and product decoration.

Practical No. 21. Development of construction of writing desks taking into account the fittings applied.

Practical No. 22. Development of a manufacturing plan of setting-up of a chair.

Learning outcomes after successful completion of this module the learner must	Evaluation criteria A trainee should
LO 6: design joinery and furniture products and develop construction documentation by means of a computer-aided engineering system, read and execute technical documentation.	<p>BE ABLE TO:</p> <p>6.1 design joinery and furniture products and develop construction documentation;</p> <p>6.2 follow regulatory and technical documentation, use means of examination and the CAD system for joinery and furniture products, define an accuracy level of processing of details by form and dimensions: admissions and seats;</p> <p>6.3 define an accuracy level of processing of details by a surface roughness class: roughness, risks, fluffiness, lousiness;</p> <p>6.4 increase quality of processing of details by form, dimensions and surface roughness class;</p> <p>form thorns, lugs, nests;</p> <p>6.5 prepare joiner's glues;</p> <p>6.6 carry out joiner's connections;</p> <p>6.7 define an accuracy level of processing of details at performing joiner's connections: gaps, tightness, admissions, seats;</p> <p>6.8 check quality of performance of joiner's works;</p> <p>classify joinery products and furniture according to use and types;</p> <p>6.9 develop constructions of joinery products and furniture;</p> <p>6.10 define forms, count and define functional and construction dimensions of joinery products and furniture</p> <p>KNOW</p> <p>6.1 tendencies of manufacture development and of joinery and furniture product advancing;</p> <p>6.2 a terminology and regulatory and technical documentation on joinery and furniture products;</p> <p>6.3 rules of construction and basic principles of design of joinery and furniture products;</p> <p>6.4 properties, characteristics of constructional materials and components;</p> <p>6.5 organization of examinations, certifications and putting into operation of joinery and furniture products;</p> <p>6.6 means of the computer-aided design systems (CAD) of joinery and furniture products;</p> <p>6.7 accuracy level of processing of details by forms and dimensions: admissions and seats;</p> <p>6.8 accuracy level of processing of details by surface roughness class: roughness, risks, fluffiness, lousiness;</p> <p>6.9 methods of formation of thorns, lugs, nests;</p> <p>6.10 ways of bending of details of joinery and furniture products;</p> <p>6.11 ways of preparation of joiner's glues;</p> <p>6.12 ways of performance of joiner's connections;</p> <p>6.13 accuracy level of processing of details at performing joiner's connections: gaps, tightness, admissions, seats;</p> <p>6.14 ways of performance of joinery preparation of details, assembly units and products from wood for finishing and facing: elimination of defects, alignment, grinding, surface conditioning;</p> <p>6.15 ways of installation of mounting and accessories;</p> <p>classification of joinery products and furniture according to use destination and type;</p> <p>6.16 main processing methods of development of construction of joinery products and furniture;</p> <p>6.17 basic principles of shaping, methods of defining of functional and constructional dimensions of joinery products and furniture</p>

PM. 07 Development and organization of the technological process for the production of woodwork and furniture

Aim:

To provide students with knowledge on development and organization of technological process of joinery and furniture products manufacturing.

Objectives:

Studying of rules of development of furniture and joinery production technolog-

ical processes, processes of production technological preparation, construction of products with use of the computer-aided design systems (CAD);

to design flow-process charts on all technological production phases of joinery and furniture products;

to organize conducting of technological processes of joinery and furniture products manufacturing

Introduction to the module:

Module PM.07 “Development and organization of technological process of joinery and furniture products manufacturing” is presented in the educational program for the major 1414000 “Furniture manufacturing (by types)” in the cycle “Professional Modules” for the qualification “Technician-technologist”

Mastering of the professional module is based on knowledge of the following disciplines: “Engineering drawing”, “Main information on wood”, “Material engineering”, “Basic principles of standardization, certification and metrology”, “Basic principles of designing of furniture constructions”, “Technology and organization of furniture production”, “Labor protection”

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM. 08 Calculations of consumption of raw materials and equipment at joinery and furniture products manufacturing

PM. 09 Basic principles of economy of production at a woodworking enterprise.

PM. 10 Designing of sites and shops of woodworking and furniture enterprises.

Module content:

Section 1.

Rules of designing, execution and reading of construction and process flow documentation. Application and types of process flow documents.

Structure, functions and possibilities of use of informational technologies in woodworking. Methods of designing of technological process at detail manufacturing. Standard technological processes of manufacturing of details, products. Application, construction and technological characteristics of details, products.

Requirements of the Unified System of Design Documentation (USDD) and the Uniform System of Technological Documentation (USTD) for execution of technical and process flow documentation.

Classification, principle of operation of processing equipment.

The basic concepts of technological processes management of the branch. Basic principles of automatic control. Rules of reading and designing of circuits of technological operations automatic control.

Compliance of a workplace to the requirements for effective use of the equipment.

Types of defects and ways of their prevention. Quality level of details, products. Methods of production quality control.

Methods and means of protection from dangerous and harmful production factors.

Themes of the out-of-class individual work:

To prepare a presentation on:

“The concept of production and technological processes of furniture production”.

“The concept of production and technological processes of joinery production”.

“Advancing of effectiveness of furniture production processes”.

“Characteristics of furniture manufacturing processes”.

Section 2.

Main types of joinery and construction products. Classification of joinery and construction products. Production of window blocks. Types of window blocks, constituents. Equipment for production of window units.

Production of door units. Constructions of door panels and frames. Applied materials. Equipment for production of door units.

Production of parquet products. Main types of parquet products. Equipment for production of parquet products.

Production of moldings. Equipment for production of moldings.

Stages of a furniture manufacturing technological process.

Production technology of cabinet furniture.

Production technology of structural furniture.

Production technology of upholstered furniture.

Practical class No. 1. Development of technological processes of window blocks manufacturing.

Practical class No. 2. Development of technological processes of door blocks manufacturing.

Practical class No. 3. Development of technological processes of cabinet furniture manufacturing.

Practical class No. 4. Development of technological processes of structural furniture manufacturing.

Practical class No. 5. Development of technological processes of upholstered furniture manufacturing.

Themes of the out-of-class individual work:

“Main types of joinery products. Classification of joinery products”.

“Types of window blocks”.

“Constructions of door panels and frames”.

“Types of parquet products”.

“Moldings”.

Section 3.

Technical specifications to window blocks. Flux lines of manufacturing of boxes, folds, glazing and assembly of window blocks. The structure of lines, technological operations carried out on them. Development and reading of drawings of window blocks with use of application packages at developing of a technological process.

Technical specifications to door blocks: requirements to accuracy of manufacturing, wood, quality of processing. Types of connections of components. Circuits of technological processes on door blocks manufacturing: boxes and panels. Development and reading of drawings of door blocks with use of application packages at developing of a technological process.

Circuits of technological processes on manufacturing of parquet products.

Cutting of slabby materials. Sites of cutting, their arrangement in the structure of a technological process. The concept of preparation, types of allowances, payload

and cutting charts. A method of development and requirements to cutting charts. Capacity rating of a cutting equipment.

Manufacturing techniques of bent details from solid wood. Basic principles of the wood bending theory. Ways of manufacturing of curvilinear details. Wood plasticization methods (steaming, boiling, warming with currents of high frequency, liquid infiltration).

Facing. Defects of adhering and facing, preventive and elimination measures. Basic principles of occupational safety and labor protection on gluing machines.

Manufacturing techniques of spring blocks, soft elastic elements (formed and sheeted).

Manufacturing techniques of soft elements. Stages of a technological process of furniture soft elements assembly (the concept of paperhanging technology).

Installation and transportation of the upholstered furniture.

Quality of processing of furniture production. A measuring and control tool used in furniture production: rules of monitoring of dimensions of details, storage, check of dimension accuracy.

Practical class No. 6. Drawing of circuits and flow charts on manufacturing of window blocks with use of the CAD system.

Practical class No. 7. Drawing of circuits and flow charts on manufacturing of door blocks with use of the CAD system.

Practical class No. 8. Designing of technological operations on parquet manufacturing.

Practical class No. 9. Designing of technological operations on flooring strips manufacturing.

Practical class No. 10. Designing of technological process of manufacturing of curved laminated wood details.

Practical class No. 11. Development of flow sheets and technological process of facing taking into account the quantity of the accepted equipment.

Practical class No. 12. Designing of a technological process of formation of furniture soft elements.

Themes of the out-of-class individual work:

“Equipment for production of window blocks”.

“Equipment for production of door blocks”.

“Equipment for production of furniture”.

“The latest equipment for production of moldings”.

“Reading of window blocks drawings. Calculation of window blocks”.

“Reading of door blocks drawings. Calculation of door blocks”.

Learning outcomes after successful completion of this module the learner must	Evaluation criteria A trainee should
LO 7 develop and organize technological processes on production of joinery and furniture production.	BE ABLE TO: 7.1 execute documentation with use of professional information processing systems; 7.2 develop technological processes on manufacturing of joinery and furniture products; 7.3 organize technological processes; 7.4 control technological processes; 7.5 carry out the analysis of defects and faults of production by conducting the actions for their prevention; 7.6 use regulatory, technical and fabrication documentation at developing the technological processes; 7.7 use application packages at carrying out technological processes, technological preparation of production, product design; 7.8 design technological processes with use of databases; 7.9 develop non-standard technological processes of manufacturing of production by orders of consumers; 7.10 develop technological operations; 7.11 create conditions of meeting the norms of labor protection, occupational and fire safety. KNOW 7.1 rules of designing, execution and reading of the construction and fabrication documentation; 7.2 application and types of fabrication documents; 7.3 structure, functions and possibilities of use of information technologies in woodworking; 7.4 methods of designing of the technological process of details manufacturing; 7.5 methods of designing of technological process of details manufacturing; 7.6 standard technological processes of manufacturing of details and products; 7.7 elements of technological operation; 7.8 classification, a principle of operation of the processing equipment; 7.9 main concepts of management of technological processes; 7.10 compliance of a workplace to the requirements for effective use of the equipment; 7.11 types of defects and ways of their prevention; 7.12 quality level of details, products; 7.13 methods of production quality control; 7.14 methods and means of protection from dangerous and harmful production factors.

PM. 08 Performing calculations on consumption of raw materials and equipment in the manufacture of woodwork and furniture production

Aim:

To provide students with knowledge on techniques of making of calculations of raw materials and equipment consumption at manufacturing of joinery and furniture products.

Objectives:

Studying of techniques of calculation of raw materials and equipment consumption at manufacturing of joinery and furniture products.

Introduction to the module:

Module PM. 08 “Making of calculations on consumption of raw materials, equipment at manufacturing of joinery and furniture products” is presented in the edu-

cational program for the major 1414000 “Furniture manufacturing (by types)” in the cycle “Professional Modules” for the qualification “Technician-technologist”.

Mastering of the professional module is based on knowledge of the following disciplines: “Main information on wood”, “Material engineering”, “Basic principles of designing of furniture constructions”, “Technology and organization of furniture production”

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM. 09 Basic principles of economy of production at a woodworking enterprise.

Designing of sites and shops of woodworking and furniture enterprises.

PM.14 Market researches and defining of needs for manufacturing of new products.

Module content:

Section 1.

Types and techniques of calculation of consumption of raw materials, processing equipment, tooling, devices, cutting and measuring tools for manufacturing of joinery and furniture products.

Techniques of engineering of necessary wood materials characterization.

Techniques of drawing of summary sheets on material consumption rates.

Themes of the out-of-class individual work:

To prepare a presentation on:

To prepare a presentation on a subject:

“Main and secondary materials used in furniture, joinery and structural production”.

“Glue materials used in furniture, joinery and structural production”.

“Paints and varnishes used in furniture, joinery and structural production”.

“Glasses and mirrors used in furniture, joinery and structural production”.

Section 2.

Input data on calculation of the main and secondary materials. Scoping of preparations of a product. Technological losses at production processes. A procedure of calculation of the main and secondary materials at manufacturing of joinery and furniture products.

Source raw materials for manufacturing of standard blanks. A procedure of calculation of the necessary number of standard blanks at manufacturing of joinery and furniture products.

Input data on calculation of the necessary quantity of timber

Procedure of calculation of necessary quantity of timber at manufacturing of joinery and furniture products.

Input data on calculation of the necessary quantity of boards (chip, fiber) and plywood. A procedure of calculation of the necessary quantity of boards (chip, fiber) and plywood at manufacturing of joinery and furniture products.

Input data on calculation of the necessary quantity of sliced and rotary cut veneer for facing. A procedure of calculation of the necessary quantity of sliced and rotary cut veneer for facing at manufacturing of joinery and furniture products.

Practical class No. 1. Calculation of the main and secondary materials.

Practical class No. 2. Calculation of the necessary quantity of timber.

Practical class No. 3. Calculation of the necessary quantity of boards (chip,

fiber) and plywood.

Practical class No. 4. Calculation of the necessary quantity of a sliced and rotary cut veneer for facing.

Themes of the out-of-class individual work:

Calculation of the main and secondary materials for different types of products (cabinets, bureaus, buffets, writing and computer tables, corner cupboards).

Section 3.

Designing of characterization of necessary wood materials for manufacturing of joinery and furniture products.

The method of calculation of quantity of waste at cutting and mechanical conversion of materials.

The method of glue materials consumption norms.

The method of calculation of norms on expenses of an abrasive belt (cloth).

The method of calculation of expenses of accessories, hardware and components

The method of paints and varnishes expenses calculation.

The method of glass and mirrors consumption calculation.

The method of paints and varnishes expenses calculation.

The method of glass and mirrors consumption calculation.

Drawing of a summary sheet on material consumption .

Development of technological process of product manufacturing.

The technique of development of procedure sheets.

Choice of the equipment, tooling, devices, cutting and measuring tools and calculation of its efficiency.

Themes of the out-of-class individual work:

Choice of the equipment and tooling at manufacturing of different types of products (cabinets, bureaus, buffets, writing and computer tables, corner cupboards).

Practical class No. 5. Calculation of the quantity of waste at cutting and mechanical conversion of materials.

Practical class No. 6. Calculation of glue materials consumption norms.

Practical class No. 7. Calculation of norms on accessories, hardware and components.

Practical class No. 8. Paints and varnishes expenses calculation

Practical class No. 9. Glass and mirrors consumption calculation.

Learning outcomes after successful completion of this module the learner must	Evaluation criteria A trainee should
LO 8: carry out calculations of consumption of raw materials, processing equipment, tooling, devices, cutting and measuring tools for manufacturing of joinery and furniture products.	BE ABLE TO: 8.1 carry out necessary calculations on consumption of raw materials, processing equipment, tooling, devices, cutting and measuring tools for manufacturing of joinery and furniture products; 8.2 read drawings of joinery and furniture products; 8.3 control compliance to technological discipline according to stages of a technological process; 8.4 use modern computer facilities by means of standard software package for calculations. 8.5 calculate norms of time and analyze effectiveness of the used time; 8.6 estimate a quality and reliability of products. KNOW 8.1 types and properties of materials, processing equipment, tooling, devices, cutting and measuring tools; 8.2 the accessories used in constructions; 8.3 basic principles of engineering graphics; 8.4 types of joiner's connections; 8.5 the fundamentals of economics; 8.6 mathematical formulas for defining areas, etc. 8.7 functional use of joinery and furniture products; 8.8 manufacturing techniques of joinery and furniture products.

PM.09 *Fundamentals of Economics at woodworking plant*

Aim:

To provide students with knowledge on defining and application of economically efficient ways of manufacturing of joinery and furniture products.

Objectives:

Development and assessment of actions for production upgrading, analysis of the main economic indexes, calculation of prime cost of joinery and furniture products.

Analysis of the main technical and economic indexes of activity of an enterprise.

Analysis of efficiency factors of use of a manpower.

Introduction to the module:

Module PM.09 "Fundamentals of economics at a woodworking enterprise" is presented in the educational program for the major 1414000 "Furniture manufacturing (by types)" in the cycle "Professional Modules" for the qualification "Technician-technologist".

Mastering of the professional module is based on knowledge of the following disciplines: "Material engineering", "Branch economics", "Management", "Basic principles of calculation of furniture constructions", "Technology and organization of furniture production".

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM.13 Organization and management of production activity within a structural division.

PM.14 Market researches and defining of needs for manufacturing of new products.

Module content:

Section 1.

Organization as fundamental unit of market economy of branches. An enterprise

as a form of an organization producing economic outputs (works, services).

The characteristic of external and internal communications of the organization (enterprise) in production process.

Fundamentals of logistics of the organization (enterprise). Material and technical resources of the organization and problems of its updating in the modern conditions.

Employees, organization of work and salary.

Main economic indexes of activity of the organization (enterprise).

Themes of the out-of-class individual work:

Structure of a production system of the organization.

Definition of external and internal environment of the organization.

Structure of the economic system of the organization.

Justification of need of logistics for activity of the organization.

Process of assessment of logistic system elements functioning effectiveness .

Research of current assets rationing methods.

Research of factors influencing the manpower use efficiency.

Classification of income and expenses of the organization.

Research of interrelation of material, labor and financial resources of the organization (enterprise).

Section 2.

The characteristic of an enterprise as a fundamental unit of the productive economy (on branches). Signs of an enterprise as a main economic subject of the market economy. Branch features of enterprises in the modern economic system. The production structure of an enterprise, its elements and directions of development.

Production, distribution, exchange and consumption of production within the organization. Purposes and tasks of management of the organization.

The concept of logistics of the organization (enterprise). The purposes and problems of logistics in activity of the organization. Scheduling of logistic processes in the organization.

The concept of the capital stock of the organization, its structure. The characteristic of the fixed capital and intangible assets. Assessment and accounting of the fixed capital. Wear and depreciation of the capital stock.

Efficiency factors of use of the manpower.

Definition of the concepts of remuneration and salary. Structure of remuneration of employees of an organization. Forms and systems of remuneration.

Costs of production and product sales.

Practical class No. 1. Calculation of the yield on capital investments coefficient.

Practical class No. 2. Analysis of the quantitative and qualitative characteristics of the personnel of the organization.

Practical class No. 3. Analysis of the quantitative and qualitative characteristics of the personnel of the organization.

Practical class No. 4. Calculation of the profit of the organization.

Practical class No. 5. Calculation of profitability indexes.

Themes of the out-of-class individual work:

Research of the methods of current assets rationing .

The technique of calculation of efficiency factors of working capital.

Natural, cost and labor production methods.

Comparison of the concepts of expenses of the organization.

Section 3.

Principles and methods of logistics. Influence of logistics on the results of activity of the organization.

Ways to increase effectiveness of the capital stock. A role of the fixed capital in manufacturing and problems of its updating in the modern conditions.

Labor productivity definition, labor input. Factors of labor productivity and reserves of its growth. Ways to increase labor productivity.

Definition of the concept of profit and profitability. Sources of profit formation and ways of its increase. The role and value the profit in the market economy. Types of profits.

Methods of effective use of financial resources. Assessment of a financial position of the organization, its solvency and profitability.

Practical class No. 6. Definition of ways of increase in labor productivity.

Practical class No. 7. Research of indexes of profitability

Practical class No. 8. Methods of effective use of financial resources.

Practical class No. 9. Definition of sources of education and elements of financial resources of the organization.

Practical class No. 10. Assessment of a financial position of the organization.

Themes of the out-of-class individual work:

Formation and distribution of net profit of the organization.

Methods of effective use of financial resources.

Assessment of a financial position of the organization, its solvency and profitability.

Research of interrelation of material, labor and financial resources.

Ways of increase in effectiveness of use of financial resources.

Learning outcomes after successful completion of this module the learner must	Evaluation criteria A trainee should
LO 9: analyze a condition of production and estimate stability of quality of production for further development and increase in overall performance of the enterprise.	BE ABLE TO: 9.1 choose economically efficient ways of manufacture of joiner's and furniture products; 9.2 efficiently use the available resources to increase production profitability; 9.3 define structure of the material, labor and financial resources of the organization; 9.4 count the main technical and economic indicators of activity of woodworking production; 9.5 solve organizational and economic problems. 9.6 make calculations of prime cost of joinery and furniture products. KNOW 9.1 main legal forms of business; 9.2 features of management in the field of professional activity; 9.3 economic bases of activity of a woodworking organization in the conditions of the market economy; 9.4 structure of management of a woodworking organization and organization of production; 9.5 ways of resource economy including basic energy saving technologies; 9.6 forms of remuneration; 9.7 the pricing mechanism of products (services); 9.8 a technique of development of a business plan.

PM . 10 *Designing sites and workshops at woodworking and furniture enterprises*

Aim:

To provide students with knowledge on designing of woodworking and furniture enterprises with application of the software, mastering of skills through defining of potential on designing of sites and shops.

Objectives:

Development of knowledge on the main types of a project for woodworking and furniture sites and shops, their main economic and ecological aspects

Introduction to the module:

Module PM.10 “Designing of sites and shops of woodworking and furniture enterprises” is presented in the educational program for the major 1414000 “Furniture manufacturing (by types)” in the cycle “Professional Modules” for the qualification “Junior production engineer”.

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM.11 Organization of the work on occupational safety and labor protection on sites and in shops of woodworking and furniture enterprises;

PM. 12 Organization of the work on ecological safety of an enterprise

PM.14 Market researches and defining of needs for manufacturing of new products;

The module includes studying of such disciplines as “Technology of joinery and furniture production”, “Electrical engineering”, “Labor protection”, “Material engineering”, “Drawing”, “Fundamentals of the market economy”, “Basic principles of standardization, certification and metrology”, “Fundamentals of informatics and industrial automation”, “Bases of management and marketing”.

Module content:

Section 1.

Introduction. Organization of line process for manufacturing of joinery products, types of materials for joinery products. Studying of market demands.

Practical class No. 1. Designing of joinery products, calculation of production capacity of mechanical shops

Section 2.

Organization of line process of manufacturing of furniture products. Types of materials for furniture production (manufacturing of cabinet furniture). Studying of market demands.

Practical class No. 2. Designing of furniture products. Calculation of productive power of assembly techniques.

Section 3.

Product line for finishing works of joinery and furniture products.

Practical class No. 3. Designing of joinery and furniture products, calculation of production capacity of finishing shops.

Results of the training after a successful completion of this module a trainee must be able to	Evaluation criteria A trainee should
LO 10 design sites and shops of woodworking and furniture enterprises	<p>10.1 be able to master the professional lexicon; 10.2 be able to work in teams, communicate efficiently with colleagues, administration, consumers 10.3 apply main normative requirements; 10.4 use own skills of reading of drawings; 10.5 work with PC, use modern informational technologies, standard softwares in his (her) professional activity; 10.6 work with reference and technical literature, regulatory documents on calculation and design of objects of woodworking production including use of the modern software products; 10.7 control quality of products from wood and wood materials according to ISO 9001:2002.; 10.8 use computer methods of collecting, storage and processing of information; 10.9 use information and communication technologies for advancing a professional activity; 10.10 draw various lines meeting the standards; 10.11 carry out inscriptions on drawings with standard type; 10.12 scale drawings, design drawings of projects in the given scale; 10.13 carry out final execution of a project drawing;</p> <p>10.1 know of the rules of occupational safety and workplace sanitation at designing of sites and shops; 10.2 understand an importance and a social significance of the future profession, be interested in it; 10.3 be competent in professional activity in the field of the woodworking industry, innovative technologies, legal and legislative acts of the Republic of Kazakhstan; 10.4 know the norms of quality control of products from wood and wood materials according to ISO 9001:2002.; 10.5 know use of the structure and purpose of the Unified System of Design Documentation (USDD); 10.6 know a graphic design of projects, technical drawing and drawing, applying of standards at execution of drawings and sketches of details; 10.7 know the norms and standards at developing design documentation with use of regulatory and technical materials (DSCD, USDD, TG); 10.8 know use of sizes and conditions of elements according to GOST 2.728-14, GOST 2.755-87, GOST 2.756-76 at designing of circuits.</p>

PM. 11 Organization of work on safety and occupational health at the sites and in workshops at woodworking and furniture enterprises

Aim:

To provide students with knowledge on organization of the work on occupational safety and labor protection on sites and in shops of woodworking and furniture enterprises.

Objectives:

Knowledge on the main works on organization of the work on occupational and fire safety and labor protection of sites and shops at woodworking and furniture enterprises, their main economic and ecological aspects.

Introduction to the module:

Module PM. 11 «Organization of the work on occupational safety and labor protection on sites and in shops of woodworking and furniture enterprises» is presented in the educational program for the major 1414000 «Furniture manufacturing (by

types)” in the cycle “Professional Modules” for the qualification “Junior production engineer”.

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM .10 Designing of sites and shops of woodworking and furniture enterprises.

PM. 12 Organization of the work on ecological safety of an enterprise

PM. 14 Market researches and defining of needs for manufacturing of new products.

The module includes studying of such disciplines as “Technology of joinery and furniture production”, “Electrical engineering”, “Labor protection”, “Material engineering”, “Fundamentals of the market economy”, “Basic principles of standardization, certification and metrology”, “Bases of management and marketing”.

Module content:

Section 1.

Introduction. Main provisions of the legislation on labor protection in the Republic of Kazakhstan. Organization of the work on creation of safe working conditions in shops and sites at woodworking and furniture enterprises. Investigation and accounting of studying of traumatism and occupational diseases in shops and sites at woodworking and furniture enterprises.

Practical class No. 1. Investigation and accounting of accidents connected with production

Practical class No. 2 . Analysis of operational injuries.

Section 2.

Weather conditions of a production environment. Occupational dust and fight against it. Harmfulness of substances and prevention of poisoning. Protection against electromagnetic and laser radiation. Occupational lighting. Protection against vibration. Protection against noise, ultra and infra sounds.

Practical class No. 3. Studying and research of harmful factors in shops and sites at woodworking and furniture enterprises.

Practical class No. 4. Choice of the required lighting intensity level. Defining of noise level vibration level in shops and sites at woodworking and furniture enterprises.

Section 3.

Issues of labor protection in project documentation. Occupational safety at work with woodworking machines. Electrical safety. Technical means of protection used in shops and sites at woodworking and furniture enterprises. Requirements to the personnel working with machine-tool equipment. A technique at production of main types of woodworking works. Safety measures at installation of building constructions and products. Occupational safety at work with tools and manual machines. Fire safety. Connection of fire safety with occupational safety.

Practical class No. 5. First-aid treatment in case of accidents.

Results of the training after a successful completion of this module a trainee must be able to	Evaluation criteria A trainee should
LO 11 organize the work on accident prevention in shops at woodworking and furniture enterprises.	BE ABLE TO: 11.1 apply safety regulations and workplace sanitation in working areas. 11.2. apply rules of electrical safety at production of joinery and furniture works; 11.3. work with reference books and catalogs; 11.4. master the professional lexicon; 11.5. work in teams, communicate efficiently with colleagues, administration, consumers; 11.6. apply the main regulatory requirements for labor protection, occupational and fire safety according to standards 11.7. define injury-causing and harmful factors in the sphere of the professional activity. 11.8. apply methods and means of protection from dangerous and harmful production factors. 11.9. classify accidents: daily accidents and accidents connected with work KNOW 11.1 comprehension of an importance and a social significance of the future profession, be interested in it; 11.2. application of the main regulatory requirements for labor protection, occupational and fire safety according to standards 11.3. application of methods and means of protection from dangerous and harmful production factors 11.4. norms of labor protection, occupational and fire safety 11.5. holding actions providing safe working conditions

PM. 12 The organization of works on the environmental safety of the enterprise

Aim:

To provide students with knowledge of organization of the work on ecological safety, mastering of skills on ecological safety at an enterprise.

Objectives:

Knowledge of the main organizational works on ecological safety at wood-working and furniture enterprises, their main economic and ecological aspects.

Introduction to the module:

Module PM. 12 “Organization of the work on ecological safety of an enterprise” is presented in the educational program for the major 1414000 “Furniture manufacturing (by types)” in the cycle “Professional Modules” for the qualification “Junior production engineer”.

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM.10 Designing of sites and shops of woodworking and furniture enterprises

PM.11 Organization of the work on occupational safety and labor protection on sites and in shops of woodworking and furniture enterprises

PM.14 Market researches and defining of needs for manufacturing of new products.

The module includes studying of such disciplines as “Technology of joinery and furniture production”, “Electrical engineering”, “Labor protection”, “Material engineering”, “Fundamentals of the market economy”, “Basic principles of standardization, certification and metrology”, “Bases of management and marketing”,

“Ecology and valueology”

Module content:

Section 1.

Introduction. Main provisions of the legislation on ecology in the Republic of Kazakhstan. The organization of work on creation of ecological working conditions in shops and sites at woodworking and furniture enterprises. A place and a role of ecology in the solution of the modern economic and political problems. Ecological safety of sawing and woodworking production.

Practical class No. 1 . Development of projects of long-term and current plans on ensuring ecological safety at enterprises, monitoring of their implementation.

Practical class No. 2. Organization of conducting environmental assessment; feasibility study of projects of expansion and reconstruction of operating productions, and also of new technologies and equipment, development of actions for introduction of a new technique meeting the requirements of ecological safety.

Section 2.

Weather conditions of a production environment. Autecology: Ecological factors, the optimum and minimum zones. Demoecology: characteristics of population, fluctuation and regulations of GOSO 03.08.351-2006, population number. Synecology: types of interaction in communities, tropical structure of the community and ecological pyramids. Functions of ecosystems: energy balance and circulation of elements, integrity and stability of ecosystems. Ecological successions. A concept of a biocenosis, a biogeocenosis, an ecosystem.

Practical class No. 1 . Control of keeping of technological modes of natural objects under protection, analysis of their work, control of keeping of standards on ecological safety and standards, state of environment in the areas of location enterprises.

Practical class No. 2 . Control of keeping the current ecological legislation, instructions, standards and standards for ecological safety reducing a harmful effect of production factors on life and health of workers by divisions of enterprises.

Section 3.

Types of land and water ecosystems. The theory of biosphere and noosphere. A creature of the biosphere and its functions. Natural resources, their irrational management. Environmental protection and environmental problems of the modern world. Ecodevelopment issues.

Practical class No. 3. Conducting examinations of compliance of equipment technical condition to the requirements of ecological safety. Designing of technical regulations, schedules of environmental control, passports, instructions and other technical documentation according to the requirements of ecological safety.

Practical class No. 4. Implementation of experimental and research works on research of more efficient methods of production meeting the requirements of ecological safety and the laboratory control of production.

Results of the training after a successful completion of this module a trainee must be able to	Evaluation criteria A trainee should
<p>LO 12</p> <p>organize the work on ecological safety at an enterprise</p>	<p>BE ABLE TO:</p> <p>12.1 conduct a conversation in the state, Russian and foreign languages</p> <p>12.2 use rules of speech etiquette, read literature of the major to search information, translate texts with dictionary, write summaries, papers and business letters in a foreign language;</p> <p>12.3 develop technology solutions for processing of wood and wood raw materials meeting the requirements of the perspective development of the branch and standards of products;</p> <p>12.4 professionally make calculations including with the help of modern programs, make calculations of technological processing of wood and consumption of wood raw materials at manufacturing of products from wood;</p> <p>12.5 make and use regulatory and legal documents connected with professional activity;</p> <p>12.6 work as an expert and a technologist of woodworking furniture production;</p> <p>12.7 develop design documentation with use of regulatory and technical materials (DSCD, USDD, TG);</p> <p>12.8 work with PC, use modern informational technologies, software in the professional activity</p> <p>12.9 work with reference and technical literature, regulatory documents by calculation and design of objects of woodworking production including with use of the modern software products;</p> <p>12.10 organize conducting of environmental assessment, feasibility study of projects, expansion and reconstruction of operating productions meeting the requirements of ecological safety.</p> <p>12.11 make reports on implementation of actions for ecological safety, prepare necessary materials for a commission on conducting environmental assessment of activity of the enterprise.</p> <p>12.12 perform experimental research works on more efficient methods of production meeting the requirements of ecological safety and also laboratory control of production.</p> <p>KNOW</p> <p>12.1 application of the main regulatory requirements for ecological safety according to the standards;</p> <p>12.2 the concept of science and its role in development of a civilization, interrelation of science and technology in the solution of modern social and ethical problems, value of scientific rationality and its historical types;</p> <p>12.3 about the main directions of advancing of modern technological processes and development of low-waste, energy saving, pollution-free technologies of processing of wood raw materials;</p> <p>12.4 solutions of problems of environment protection, ecology, safety, life activity;</p> <p>12.5 respect of the norms of ecological safety.</p> <p>12.6 holding actions providing safe working conditions.</p> <p>12.7 about a condition of the main scientific and technical problems and the prospects of development of the woodworking industry and connected industries</p> <p>12.8 main physicomaterial properties of wood of different breeds, wood materials, glue, facing and finishing materials and technological processes of their production</p> <p>12.9 bases of design and construction of products from wood, modern materials and connections, constructions of furniture and products from wood and wood materials</p> <p>12.10 main ways of increase in effectiveness of use of wood raw materials</p> <p>12.11 calculation methods of consumption of materials, dimensions of the projected products and technological processes of their manufacturing</p> <p>12.12 issues of labor protection and occupational safety, nature protection legislation</p>

PM.13 *The organization and management of production activities within the framework of the structural unit*

Aim:

To provide students with knowledge on planning and organization of the activity of a structural division.

Objectives:

To carry out and execute work documentation on planning and organization of the activity of a structural division. Definition of actual conditions of development and scheduling of actions for improvement of the activity of a structural division. Studying of a technological process of manufacturing of a structural division. Definition of effectiveness of use of time and loading of the equipment.

Analysis of the main technical and economic indexes of activity of structural divisions. Analysis of efficiency factors of use of a manpower.

Introduction to the module:

Module PM.13 “Organization and management of production activity within a structural division” is presented in the educational program for the major 1414000 “Furniture manufacturing (by types)” in the cycle “Professional Modules” for the qualification “Junior production engineer”.

The module includes studying of such disciplines as “Main information on wood”, “Branch economics”, “Basic principles of standardization, certification and metrology”, “Basic principles of designing of furniture constructions”, “Technical application of machines and equipment”, “Technology and organization of furniture production”, “Labor protection”, “Psychology of engineering activity”.

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM. 14 Market researches and defining of needs for manufacturing of new products.

Module content:

Section 1.

The concept and theoretical bases of management of a structural division.

Administrative activity of a structural division. Effective management of a structural division.

Professional self-determination. Career planning. Human resource management.

Quality of production in the branch. Examination of joinery and furniture production.

Environmental protection. Industrial ecology. Management of industrial wastes. Ecoaudit of a structural division of the enterprise.

Themes of the out-of-class individual work:

1. Active search of information about demand of experts in the sphere of joinery and furniture production.

2. Creation of self-presentations as a self-advertisement of a future expert.

3. Acquaintance with official duties of experts of an average group in the field of joinery and furniture production.

4. Designing of sketches of the head's workplace interior

5. Designing of sketches and drawings of products.

6. Execution of documentation on conducting examination of wood and furniture

products.

7. Development of organizational structures of production management.

Section 2.

Classification of enterprises of the woodworking industry. Types of processes at the enterprises of the industry. Structure of basic processes.

Job specialization in management. Content of managerial work at production.

The concept of management efficiency. Efficiency measurement indicators.

Characteristics of professional activity of a technician-technologist in the field of joinery and furniture production.

Choice of priorities. Planning of a successful professional career. Crises of professional development. Professional burnout syndrome. Professional destructions. Dismissals.

Personnel management psychology. Work collective and collective work. Management of a production team.

Product quality indicators. The concept of product lifecycle.

Products quality management systems. The basic rules of conducting examination of quality and quantity of goods on the example of products from wood.

Conversion, utilization, storage and waste disposal of production.

Ecoaudit of industrial enterprises.

Practical class No. 1. Description of an enterprise management structure.

Practical class No. 2. Description of a shop management structure.

Practical class No. 3. Job search. Writing of CV.

Practical class No. 4. Basic principles of workplace organization of a technician-technologist.

Practical class No. 5. Efficiency evaluation of work of the organization personnel.

Themes of the out-of-class individual work:

Forming of structure of a quality management system at enterprises of the industry taking into account specific character of their production and types of products.

Studying of forms and types of engineering supervision and their classification by characteristics.

Development of quality control chart on products.

Section 3.

Modern trends in development of management structures on woodworking enterprises.

Control of the management process. Personnel administration plan and its role in management. Legal basis of management of a structural division.

Laws of professional communication. Ethics of business relations. Image of an expert of an average level.

Conflict management in a structural division. Business and managerial communication: concept and application.

Analysis of the economic activity of a structural division of the enterprise.

Practical class No. 6. Development of a personnel administration plan for experts of an average level.

Practical class No. 7. Studying of qualitative indexes of the materials applied in production of furniture.

Practical class No. 8. Quality control of furniture products.

Practical class No. 9. Calculation and analysis of performance indicators of use of material resources.

Practical class No. 10. Calculation and analysis of the enterprise activity results.

Themes of the out-of-class individual work:

Functions of structural division management.

Strategic planning: concept, application.

Methods of structural division management.

Fundamentals of the theory of management decision making.

Management decision: concept, essence, classification: requirements imposed to management decisions.

Risk management in case of management decision making. Main types of organizational structures of management.

Results of the training after a successful completion of this module a trainee must be able to	Evaluation criteria A trainee should
LO 13: plan and take part in joinery and furniture production within a structural division.	<p>BE ABLE TO: organize rationally workplaces, participate in personnel placement, provide them with work equipment and instruments; 13.2 inform personnel of plan targets by quantity and quality of products; 13.3 define responsibilities and authorities of the personnel; 13.4 make and implement management decisions; 13.5 assess an impact of negative industry-related factors on the environment; 13.6 save ecology at implementation of professional activities; 13.7 motivate employees on solution of production tasks; 13.8 manage conflict situations, stresses and risks; 13.9 execute documentation on product quality control; 13:10 fill in reporting documentation and analyze work of the division; 13:11 apply provisions of legal regulation</p> <p>KNOW 13.1 organize rationally workplaces, participate in personnel placement, provide them with work equipment and instruments; 13.2 inform personnel of plan targets by quantity and quality of products; 13.3 define responsibilities and authorities of the personnel; 13.4 make and implement management decisions; 13.5 assess an impact of negative industry-related factors on the environment; 13.6 save ecology at implementation of professional activities; 13.7 motivate employees on solution of production tasks; 13.8 manage conflict situations, stresses and risks; 13.9 execute documentation on product quality control; 13.10 fill in reporting documentation and analyze work of the division; 13.11 apply provisions of legal regulation</p> <p>KNOW 13.1 features of management in the field of professional activity; 13.2 principles, forms and methods of organization production and engineering procedures; 13.3 requirements of the legislation in environmental issues; 13.4 principles of rational environmental management; 13.5 fundamentals of the industrial ecology; 13.6 principles of business communication in collective; 13.7 control methods and regulatory documentation on product quality control; 13.8 concepts, purposes, objectives, methods and tools of organization and the order of carrying out of ecoaudit.</p>

PM.14 *Market research and identification of needs in the production of new products*

Aim:

Development of knowledge on marketing, on essence of marketing, reasons of its emergence, studying of types of marketing depending on the market demand condition.

Objectives:

To provide students with knowledge on essence of marketing, marketing researches, marketing types depending on the market demand condition.

Introduction to the module:

Module PM.14 “Market researches and defining of needs for manufacturing of new products” is presented in the educational program for the major 1414000 “Furniture manufacturing (by types)” in the cycle “Professional Modules” for the qualification “Junior production engineer”.

Mastering of the module is a necessary step for subsequent studying of the following professional modules:

PM. 11 Organization of the work on occupational safety and labor protection on sites and in shops of woodworking and furniture enterprises

PM. 12 Organization of the work on ecological safety of an enterprise

PM. 13 Organization of the work on ecological safety of an enterprise

The module includes studying of such disciplines as “Technology of joinery and furniture production”, “Labor protection”, “Material engineering”, “Fundamentals of the market economy”, “Basic principles of standardization, certification and metrology”, “Fundamentals of informatics and industrial automation”, “Bases of management and marketing”.

Module content:

Section 1.

Introduction. Marketing types depending on a demand condition. Marketing in Kazakhstan. Market research. Marketing researches. Consumer behavior. Models and behavior of a corporate consumer.

Practical class No. 1. Information research for segmentation of the consumer market and the market of organizations.

Practical class No. 2. Positioning of new goods.

Section 2.

Defining of the target market. Commodity policy of a company. Price fixation. The strategy of pricing of new goods.

Practical class No. 3 . Implementation of price strategies.

Section 3.

Organization of marketing of goods. Promotion of products. Public regulation of marketing.

Practical class No. 4. The most effective methods and distribution channels, defining of the purpose and tasks of merchandising for the woodworking industry.

Results of the training after a successful completion of this module a trainee must be able to	Evaluation criteria A trainee should
<p>LO 14 differentiate marketing management concepts, make a “marketing - mix”</p>	<p>BE ABLE TO: 14.1. set the purposes and formulate objectives connected with implementation of professional functions; 14.2. use information obtained as a result of marketing researches; 14.3. carry out complex and situation analysis of a competitive environment of the organization; 14.4. make decisions in stressful conditions and at limited time; 14.5. master skills of a professional evaluation of strategic planning; 14.6. apply methods of quantitative analysis, modeling, theoretical and experimental research; 14.7. develop and implement basic marketing programs; 14.8. conduct polls and focus groups at market researches; 14.9. find ways to improve existing constructions, technologies or materials to increase product competitiveness; 14.10. define methods of use of the latest developments of science and technology to create new competitive products; 14.11. carry out analytical work on generalization of experience of competitors and work on research of the market environment; 14.12. carry out model developments, conduct experimental and test works.</p> <p>KNOW 14.1. principles of strategic and tactical planning; 14.2. activities of a marketing expert; 14.3. principles of work with media; 14.4. principles of forming of budget and work planning of a marketing expert; 14.5. systems of actions to overcome crises in the organization; 14.6. principles of assessment of performance of advertising and public relations department; 14.7. fundamental laws and bylaws of the Republic of Kazakhstan regulating marketing activity in Kazakhstan 14.8. principles of creation and registration of materials for expert assessment and reports; 14.9. techniques of assessment and selection of innovative projects 14.10. about collection and systematization of scientific and practical information on researches in the field of marketing, advertising and PR. 14.11 techniques of carrying out market observations, polls, experiments to improve image and a competitiveness on the market.</p>

7 Education process plan

Specialty: 1414000 - Furniture manufacturing (by types) **Qualification:**

Assembler of wood products

Master of carpentry and furniture production

Technician-technologist

Junior production engineer

Mode of study: full-time

Normative period of training: 4 years 10 months

on the basis of general secondary education

with getting a qualification: **Technician – technologist 3 years 10 months**

On the basis of fundamental secondary education 2 years 10 months with getting a

qualification: **Junior production engineer+ 10 months**

Index	Name of cycles, disciplines / modules, practices	Form of control				TOTAL	The amount of study time (hours/credits)			Distribution by semesters
		Examination	Assessment	Test (Control work)	Term project		Theoretical classes	Practical training *	Industrial training	
1	2	3	4	5	6	7	8	9	10	11
GEM	General education disciplines					1448	864	584		1-3
GHM.00	General humanitarian modules (Professional Kazakh language, Professionally foreign language, document management, physical training)		+	+		216				3-5

	Qualification: «Technician - technologist»																			
PM. 06	Design and construction of joinery and furniture products using software.	+							+	92	48	44								5-6
PM. 07	Development and organization of the technological process for the production of woodwork and furniture	+								92	52	40								5-6
PM. 08	Performing calculations on consumption of raw materials and equipment in the manufacture of woodwork and furniture production		+							92	54	38								5-6
PM. 09	Fundamentals of Economics at woodworking plant.	+							+	92	52	40								5-6
	Total for Professional modules									368	206	162								
	Qualification «Junior production engineer»																			
BM.00	Basic modules (Advanced Mathematics, General physics, General chemistry, Modern history of Kazakhstan, Mechanical engineering, Engineering drawing)																			
	Professional modules																			
PM. 10	Designing sites and workshops at woodworking and furniture enterprises.	+							+	175	95	80								7-10
PM. 11	Organization of work on safety and occupational health at the sites and in workshops at woodworking and furniture enterprises.	+								175	125	50								7-10
PM. 12	The organization of works on the environmental safety of the enterprise	+								167	105	62								7-10
PM. 13	The organization and management of production activities within the framework of the structural unit.	+								137	90	47								8-10
PM. 14	Market research and identification of needs in the production of new products.	+							+	137	90	47								8-10
	Total for Professional modules									791	505	286								
PP.00	Industrial Training and Professional Practice									1836										
PP. 01	Practice in training and production workshops									72										2-4
PP. 02	Practice for obtaining of a work profession 141405 2 – Assembler of wood products									108										2
PP.03	Practice for obtaining of a work profession 141407 2 – Master of carpentry and furniture production									288										3-4
PP. 04	Industrial									576										5-6
PP. 05	Technological									288										8

PP. 06	Undergraduate practice								216					10
PP. 07	Diploma project								288					10
IA	Interim assessment								360					
FE	Final examination								72					
IA. 01	Attestation in educational institutions								60					
IA. 02	Assessment of the level of professional readiness and assignment of qualification								12					
	Total for compulsory education								7200					
K	Consultations								not more than 100 hours for the academic year					
EA	Extracurricular Activities								not more than 4 hours per week					
	Total:								8264					

Note:

An indicative list of the industrial equipment and technical training are determined based on the content of the disciplines of relevant specialty educational programs.

The list of the industrial equipment and technical training to equip each institution is determined by the institution in cooperation with partner companies, for which staff is prepared, taking into account the working curriculum. It is necessary to take into account the IT-technology, 3D-technology, ICT, remote, modular, dual, credit education, taking into account the prospects of development of the industry.

8. Explanatory note

The section “*Education plan (Curriculum)*” is one of the most important sections of the educational program and includes curriculum and an explanatory note to the curriculum.

When designing the curriculum one should take into account the framework of educational programs realization taking into account the relevant times of training.

Educational program describes the curriculum in accordance with SCES of appropriate levels of education.

The curriculum is developed taking into account the continuity of skill levels (advanced level specialist, specialist of mid-ranking, B.A.Sc.).

Study plan governs the structural content (list) of training programs for the modules and practice; forms of control; the amount of training time (hours, credits), including termly (by semesters).

Curriculum reveals the structural content of training, the amount of training time for the modules, the sequence of modules learning.

All modules include “training effect” and all modules will be placed in the context of construction (construction and communal services).

Each module and each qualification in the structure will have the sum of credits. Module credits specifies the number of credits that will be assigned to the student who has attained the result of learning in the module.

Module credits are based on:

- one credit for the result of learning achieved for 10 hours of learning, including Controlled Learning Hours (CLH);
- training time; is defined as the time taken by student at the module level, on average, to complete the study results up to the standard of a particular criterion;
- sum of module credits; It will remain constant in all situations, regardless of the method used for evaluation of qualifications, to which it belongs.

Learning time should review all training (including evaluation), referring to the results of the evaluation, regardless of where, when and how the training was conducted.

General educational disciplines (modules) are 1448 hours.

Socio-economic modules cycle is implemented in preparing professionals to mid-level with amount of training time not exceeding 180 hours.

A critical component of the program is an emphasis on practical training of students. To do this, in developed educational programs professional modules and industrial training must be combined. That is, if in the model education plans (MEP) the industrial training is defined separately and belongs to professional practice, in the developed programs it is distributed in professional modules.

Educational program aimed **at professional training** includes:

- 1) study of basic general professional modules;
- 2) performing laboratory and practical classes on general professional modules;
- 3) passing of industrial training and professional practice;
- 4) performing of course and diploma projects (works).

Learning process in educational institutions, implementing educational programs of technical and vocational, post-secondary education includes theoretical studies and industrial training performed in educational-production workshops, educational farms and training grounds under the guidance of the master of industrial training, as well as directly on the

production and organizations of the appropriate profile.

Professional practice is carried out in the respective organizations, workplaces, provided by employers on the basis of contract and is aimed at the formation of professional competences.

Practical training (laboratory and practical classes in general professional modules, modules, defined by the Organization of the education, industrial training and professional practice, course and diploma projects) shall be not less than 40% of the total study time of compulsory education (excluding general education and socio-economic modules).

Educational programs of technical and vocational education using the dual education include theoretical classes in educational institutions and at least sixty percent (60%) of training practices at the company.

Course projects (works) are considered as a type of academic work on general professional and Special subjects/modules and executed within the training time for their study. Number of course projects (works) in a semester is not more than one. Additionally it is allowed to schedule one term paper (project).

The length of time spent on diploma project should not exceed 6 weeks. Duration of undergraduate (qualifying) practice is planned depending on the complexity of the profession.

To take into account the regional specificities and requirements of employers to training of personnel on a specialty the *subjects/modules defined by educational organizations* is considered.

To determine the quality of acquisition of the educational programs by students the curriculum provides **interim and final attestation**.

Conducting *interim attestation* is envisaged for all subjects/modules, the main forms of which are: exam, test, control work.

Interim attestation in general educational subjects provides examinations on: language, literature, history of Kazakhstan, mathematics and selection of organization of technical and vocational education.

The number of exams, tests and control works on general Humanities, socio-economic, general professional modules is determined on the basis of the requirements to the level of knowledge, skills and competences required of the trainee.

Control works and tests are carried out at the expense of training time for the study of this discipline (module), exams - at terms dedicated for interim attestation.

As a result of interim certification for a modular curriculum and passing the qualification exam for working professions which includes professional readiness level assessment and award students are assigned to the achieved vocational qualification level (category, class, category).

Final attestation of students of organizations of technical and vocational education include:

- attestation of students in educational institutions;
- assessment of the level of professional readiness and assignment of qualification (for the established and high levels of qualifications).

Final attestation of students in educational institutions is carried out to determine the level of acquisition of educational programs by students according to the results of a full course of study.

Possible forms of final attestation of educational institutions on the results of completion of educational programs: exams on general professional modules and professional modules, or execution and defense of a diploma project, or thesis execution and defense with final

attestation exam for one of professional modules.

Assessment of the level of professional readiness and assignment of qualification (hereinafter referred to as the ALPRAQ) in the specialty consists of two stages:

- 1) theoretical testing on subjects/modules, defining professional training;
- 2) performing practical tasks on levels of qualification.

The amount of training time for final attestation is not more than 2 weeks. Not less than 12 hours of them is given for organization and conduct of ALPRAQ for one group (depending on the specialty specifics and the educational process may vary upwards).

Consultation and Extracurricular Activities are aimed at ensuring the individual abilities and requests of students.

Extracurricular Activities are provided for the entire period of study of the rate of not more than 4 hours a week and are not obligatory to study.

Consultations are provided up to 100 hours for each academic year depending on specialty and education period for one training group.

The amount of time and consultation form (Group, individual, written, etc.) are determined by the educational organizations in drawing up the working curriculum.

When preparing model education plans one should take into account that:

- the school year begins on Sept. 1 and ends depending on the Organization of educational process associated with specificity;
- vacation time is 11 weeks in the year, including winter period - not less than 2 weeks, except military specialties. Students who have concluded dual education contracts with the enterprise may internship in vacation time in enterprises;
- the maximum amount of study load of students is not more than 54 hours per week, including mandatory academic load at full-time education -not less than 36 hours per week (the specified amount does not include the extracurricular classes and consultations).

Educational program and teaching plan consist of various modules. The term “module” explains model of “training areas” that are taught in a combination of theoretical and practical units. Using modular-competence structure in the educational process provides the flexibility in building the course, the opportunity to better meet the needs of students in individualization of educational process. Each module provides the appropriate competence and evaluation criteria. With this, learning sessions are of practice-oriented form. Developers (the educational institution) of working education programs, taking into account requirements of customer-employer, can review the structure and number of modules on the decrease, i.e., grouping a number of competencies for specific jobs by type of related qualifications. Thus, given the flexibility of the modular-competence structure of educational program, all modules competencies optionally can be grouped into separate modules by qualifications. Professional modules for qualifications **141405 2 Assembler of wood products** and **141407 2 Master of carpentry and furniture production** are combined because both qualifications review their modules and they are supplemented with modules of related qualification. After a successful study of each module and confirming the proper work qualifications, assignment of qualification “Technician-technologist” is possible. After completion of the program of applied Bachelor’s program final attestation on assignment of qualification of “Junior production engineer” is conducted.

9. List of recommended equipment

№	Name	Technical specification	Equipment assignment/ Covered topics	Module (-s) wherein the equipment is used	Comments
Machine-tool equipment					
1	Panel-sizing and cutting machine with movable carriage	Main motor 3 (4) kW, movable carriage 1500 mm and more, facing machine from 0.5 to 0.8 kW), the slope of the saw machine 0-45°, 380 (400) V.	<p>Operations: Sawing of lumber, wood and synthetic panels, aluminium.</p> <p>Topics: Wood materials and its using during manufacture of joiner and furniture products. Rules of selection and use of wood materials for production of templates, joiner and furniture products. Cutting of billets, workpieces of templates, joiner and furniture products.</p> <p>Rules of selection and use of wood-cutting tools for production of joiner and furniture products</p> <p>Observance of technological modes of working on the machine. Corrective adjustment of equipment, techniques for working on the machines.</p> <p>Rules of work safety and industrial hygiene</p>	<p>Basic General Professional module (BGPM 01)</p> <p>BGPM 02</p> <p>BGPM 03</p> <p>BGPM 05</p> <p>BGPM 07</p> <p>PM 01</p> <p>PM 02</p> <p>PM 03</p> <p>PM 04</p> <p>PM 05</p> <p>PM 06.</p> <p>PM 07</p> <p>PM 08</p> <p>MO 01</p> <p>PM 09</p> <p>PM 10</p> <p>PM 11</p> <p>PM 12</p> <p>PM 13</p>	

2	Straightening and thickening machine	<p>Marking Gage</p> <p>Size of thickening table is 415x630 mm Min/max thickness of billet 4/230 mm Feed capacity of motor is 0,33 CV (0.25 kW) Max. depth of removal layer is 4 mm Feed rate of billet is 6 m/min</p> <p>Jointer</p> <p>Size of straightening tables (total) 415x1800 mm Diameter of joiner shaft is 95 mm Number of knives 3 pcs. Dimensions of knives is 415*30*3 mm Max. thickness of removed layer is 8 mm Motor power of joiner shaft 4 CV(3 kW) Machine weight, net weight is 380 kg</p>	<p>Operations: Processing of wood block. Creation of base and chipping to the size</p> <p>Topics: Wood materials and its using in manufacture of joiner and furniture products. Rules of selection and use of wood materials for production of joiner and furniture products. Ways of billets mechanical processing for templates, joiner and furniture products. Rules of selection and use of wood-cutting tool. Observance of technological modes on the machine. Corrective adjustment of equipment, techniques for working on the machines. Rules of work safety and industrial hygiene</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06. PM 07 PM 08 PM 09 MO 01 PM 10 PM 11 PM 12 PM 13</p>	
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3	Milling machine with movable carriage	<p>Size of worktable is 1000x680 mm</p> <p>Useful length of spindle with diam. 30- 35 mm is 140 mm</p> <p>Spindle rotational speed is 1500-3000-4500-6000-10000 r/min</p> <p>Max. diam. of cutters is 150 mm</p> <p>Depth of spindle pot is 90 mm</p> <p>Motor power is 5,5 VC (4 kW) 50 Hz</p> <p>Net weight is 410 kg</p>	<p>Operations: Processing of wood block and wood boards.</p> <p>Chipping, form milling, contour cutting, sawing for fine billets.</p> <p>Topics: Wood materials and its using in manufacture of joiner and furniture products.</p> <p>Rules of selection and use of wood materials for production of joiner and furniture products.</p> <p>Ways of billets mechanical processing for templates, joiner and furniture products.</p> <p>Rules of selection and use of wood-cutting tool on the machine.</p> <p>Observance of technological modes on the machine.</p> <p>Corrective adjustment of equipment, techniques for working on the machines.</p> <p>Rules of work safety and industrial hygiene</p>	<p>BGPM 01</p> <p>BGPM 02</p> <p>BGPM 03</p> <p>BGPM 05</p> <p>BGPM 07</p> <p>PM 01</p> <p>PM 02</p> <p>PM 03</p> <p>PM 04</p> <p>PM 05</p> <p>PM 06.</p> <p>PM 07</p> <p>PM 08</p> <p>MO 01</p> <p>PM 09</p> <p>PM 10</p> <p>PM 11</p> <p>PM 12</p> <p>PM 13</p>	
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4	Wood-working lathe with copying machine	<p>Length x width x height of machine 2200x480x1150 mm</p> <p>Maximum length between centers is 1400 mm</p> <p>Maximum machining diameter is 420 mm</p> <p>Maximum length of copying is 1300 mm</p> <p>Maximum diameter of copying is 120 mm</p> <p>Spindle rotational speed is 500 – 1000 – 1950 – 2800 r/min</p> <p>Screw of spindle is M33 x 3.5 mm</p> <p>Cone of headstock MK 2</p> <p>Electric motor power is 1.1 kW</p>	<p>Operations: Turning of furniture workpieces and decorative elements made of wood block.</p> <p>Topics: Wood materials and its using in manufacture of joiner and furniture products. Rules of selection and use of wood materials for production of joiner and furniture products.</p> <p>Ways of billets mechanical processing for templates, joiner and furniture products.</p> <p>Rules of selection and use of wood-cutting tool and hand tools (wood chisel) on the machine.</p> <p>Observance of technological modes on the machine.</p> <p>Corrective adjustment of equipment, techniques for working on the machines.</p> <p>Rules of work safety and industrial hygiene</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 PM 01 PM 02 PM 04 PM 06 PM 07 PM 08 PM 09 PM 10 PM 11 PM 12 PM 13</p>	
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5	Grinding and disk machine with belt	<p>Size of working table is 700x350 mm</p> <p>Width of grinding belt is 150 mm</p> <p>Circle diameter is 600 mm</p> <p>Belt length is 1860 mm</p> <p>Motor 3 CV (2.2 kW)</p> <p>Circle rotational rate is 900 r/min</p> <p>Belt speed is 9 m/sec</p> <p>Angle of slope of working table is 45°</p> <p>Angle of slope of guideway is 45°</p>	<p>Operations: Grinding of wood surface, scale wood, wood boards</p> <p>Topics: Wood materials and its using in manufacture of joiner and furniture products.</p> <p>Rules of selection and use of wood materials for production of joiner and furniture products.</p> <p>Ways of billets mechanical processing for templates, joiner and furniture products.</p> <p>Rules of selection and use of abrasive tool on the machine.</p> <p>Corrective adjustment of equipment, techniques for working on the machines.</p> <p>Observance of technological modes on the machine.</p> <p>Rules of work safety and industrial hygiene.</p>	<p>BGPM 01</p> <p>BGPM 02</p> <p>BGPM 03</p> <p>BGPM 05</p> <p>BGPM 07</p> <p>PM 01</p> <p>PM 02</p> <p>PM 03</p> <p>PM 04</p> <p>PM 05</p> <p>PM 06.</p> <p>PM 07</p> <p>MO 01</p> <p>PM 08</p> <p>PM 09</p> <p>PM 10</p> <p>PM 11</p> <p>PM 12</p> <p>PM 13</p>	
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6	Thermo-vacuum press	<p>Processed dimension 2850 x 1150 mm Vacuum pump 16/25/40 m³/h. Power is 4.55/4.75, /5.25 kW, 400 V. Processing temperature is 0-600 Membrane - natural rubber, rubber</p>	<p>Operations: Facing of workpieces surface of furniture with scale wood, paper films, polyvinyl chloride Topics: Wood, plate and facing materials, its using in manufacture of joiner and furniture products. Rules of selection and use of wood, plate and facing materials for production of joiner and furniture products. Ways and methods of facing operations of wood and joiner billets. Rules of selection and use of glue materials on the machine. Corrective adjustment of equipment, techniques for working on the machines. Rules of work safety and industrial hygiene Observance of technological modes on the machine.</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06. PM 07 PM 08 MO 01 PM 09 PM 10 PM 11 PM 12 PM 13</p>	
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7	Horizontal drilling and grooving machine	<p>Max. groove length-240 mm Max. groove depth - 180 mm Vertical stroke of the head is 160 mm Size of working table is 565x315 mm Clamp (collet) westcott 0-20 mm Rotational rate of socket is 3000 rpm Motor power is 2 CV (1.5 kW)</p>	<p>Operations: Hole making, sampling of grooves in the work-pieces of wood block and wood-based panels Topics: Wood materials and its using in manufacture of joiner and furniture products. Rules of selection and use of wood materials for production of joiner and furniture products. Ways of billets mechanical processing for templates, joiner and furniture products. Rules of selection and use of wood-cutting tool on the machine. Observance of technological modes on the machine. Corrective adjustment of equipment, techniques for working on the machines. Rules of work safety and industrial hygiene.</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06. PM 07 PM 08 MO 01 PM 09 PM 10 PM 11 PM 12 PM 13</p>	
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8	Drilling adding multiple-spindle machine	<p>Swing movement of drilling group from horizontal position to vertical position, pneumatic.</p> <p>Number of spindles is 21 pieces</p> <p>Distance between two spindles is 32 mm</p> <p>Distance between outer spindles is 640 mm</p> <p>Max. drilling depth is 65 mm</p> <p>Max. size of billet is 880x3000 mm</p> <p>Max. thickness of billet is 90mm</p> <p>Number of clamps is 2 pcs</p> <p>Working pressure of air is 6-8 bar</p> <p>Air consumption for working cycle is 10 L/cycle</p> <p>Number of motors 1 pcs</p> <p>Power of motor is 2 CV(1.5 kW)</p> <p>Rotation speed is 2800 r/min</p>	<p>Operations: Drilling of in-line holes in workpieces of furniture boards (laminated chip board, MDF), wood block.</p> <p>Topics: Wood materials and its using in manufacture of joiner and furniture products.</p> <p>Rules of selection and use of wood materials for production of joiner and furniture products.</p> <p>Ways of billets mechanical processing for templates, joiner and furniture products.</p> <p>Rules of selection and use of wood-cutting tool on the machine.</p> <p>Observance of technological modes on the machine.</p> <p>Corrective adjustment of equipment, techniques for working on the machines.</p> <p>Rules of work safety and industrial hygiene</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06. PM 07 PM 08 MO 01 PM 09 PM 10 PM 11 PM 12 PM 13</p>	
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9	Edgebander with hand-feed	<p>Height of edging material is 10-60 mm Thickens of edging material is 0.3 mm /3 mm Min. inner radius of workpiece is 20 mm Feed speed is 4.8 m/min Volume of glue pan is 1.5 kg Total installed power is 2.5 kW Working pressure is 7-8 ATM. Control of cutting edge is a pedal Aspiration is 60 mm</p>	<p>Operations: Bonding on straight and curved edges of furniture workpieces of the facing from scale wood, films of PVC, ABS, melamine film. Topics: Wood and facing materials and its using in manufacture of joiner and furniture products. Rules of selection and use of wood and facing materials for production of joiner and furniture products. Rules of selection and use of wood-cutting tool and glue materials on the machine. Ways of billets facing for joiner and furniture products. Observance of technological modes on the machine. Corrective adjustment of equipment, techniques for working on the machines. Rules of work safety and industrial hygiene</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06. PM 07 PM 08 MO 01 PM 09 PM 10 PM 11 PM 12 PM 13</p>	
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10	Edgebander with automatic feeding	<p>The machine includes: the guideway at the entrance with heat</p> <ol style="list-style-type: none"> 1) frontal unit (2 inclined motors HF 0,5 CV (0.38 kW)) 2) Removal unit from scale (2 of inclined motor HF 0.75 CV (0.55 kW), micrometric adjustment with numeric mechanical counter) 3) polishing unit (2 motors 0.25 CV (0.19 kW)) <p>with cloth discs with a diameter of 100 mm)</p> <p><u>Technical characteristics</u></p> <p>Min. width of the billet is 90 mm Min. length of the billet is 180 mm Min. thickness of the billet is 10 mm Max. width of the billet is 40 mm Thickness of edge in rolls and strips 0,4-3 mm</p> <p>1 feed speed 11 m/min Installed capacity: 6.5 kW</p>	<p>Operations: Bonding on straight and curved edges of furniture workpieces of the facing from scale wood, films of PVC, ABS, melamine film.</p> <p>Topics: Wood and facing materials and its using in manufacture of joiner and furniture products.</p> <p>Rules of selection and use of wood and facing materials for production of joiner and furniture products.</p> <p>Ways of billets mechanical processing for joiner and furniture products.</p> <p>Rules of selection and use of wood-cutting tool and glue materials on the machine.</p> <p>Ways of billets facing for joiner and furniture products.</p> <p>Observance of technological modes on the machine.</p> <p>Corrective adjustment of equipment, techniques for working on the machines.</p> <p>Rules of work safety and industrial hygiene</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06. PM 07 PM 08 MO 01 PM 09 PM 10 PM 11 PM 12 PM 13</p>	<p>The machine performs operations in automatic mode: Gluing edge, cutoff turning of edge overhangs, milling of edge overhangs, polishing of edge's fin.</p>
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11	<p>Machining center unit with Numerical Program Control</p>	<p>Moving the milling unit along the axes - X Y Z 2600x1500 X100 mm Stroke of drilling head along the axes X Y Z-2600x1500x100 mm Maximum stroke speed of the axes X Y Z, m/min 60; 37; 15 WORKING TABLE Dimensions X Y 2610 x 1520 mm Vacuum pump 250m³/hour DRILLING UNIT Independent vertical spindles along the axes X /Y - 4/4,2/1 Optional horizontal spindles along the axes X /Y – The stroke between spindles is 32 mm Motor power is 1.5 kW Rotation speed of the spindles is 3600 r/min SAW UNIT Grooving saw built in drilling head 1.5 kW, ø 100 mm, 700 r/min MILLING UNIT Electrical spindle ISO 30 (option HSK 63) 7.5 kW, 1000 – 24000 r/min TOOL CHANGER - carousel-type for 10 positions NUMERICAL CONTROL AND SOFTWARE Numerical control with PC (TPA) INSTALLATION AND TRANSPORTATION Power supply is 21 kW Working air pressure is 6-8 bar Compressed air flow rate 100 L/min. Upper aspiration tube section is 2 x Ø 100 mm + 1 x ø 50 mm Air flow in the aspiration unit is 5300 m³/h Weight of the machine is 2200 kg</p>	<p>Operations: milling, grooving, sawing, drilling in automatic mode, numerical control. Topics: Wood materials and its using in manufacture of joiner and furniture products. Rules of selection and use of wood materials for production of joiner and furniture products. Ways of billets mechanical processing for joiner and furniture products. Rules of selection and use of wood-cutting tool on the machine. Observance of technological modes on the machine. Corrective adjustment of equipment, techniques for working on the machines. Rules of work safety and industrial hygiene</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 05 BGPM 07 BGPM 08 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06. PM 07 PM 08 MO 01 PM 09 PM 10 PM 11 PM 12 PM 13</p>	<p>The machine is capable to replace several machines in production: milling, drilling vertical, drilling horizontal, groove operations. Templates manufacturing are not required for performing of milling complex configurations</p>
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12	Grinding universal machine for the saw blades, cutters and plain knives		<p>Operations: Grinding of saw blades, cutters, drills.</p> <p>Topics: Wood materials and its using in manufacture of joiner and furniture products. Rules of selection and use of abrasive materials for grinding of wood-cutting tool. Technological procedures and modes of wood-cutting tool grinding. Rules of selection and use of wood-cutting tool in manufacture of joiner and furniture products. Observance of technological modes on the machine. Corrective adjustment of equipment, techniques for working on the machines. Rules of work safety and industrial hygiene</p>	BGPM 03 PM 01 PM 02 PM 03 PM 04 PM 05 PM 07 PM 10 PM 11 PM 12	
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13	Dust extraction	<p>1.1 kW, speed of exhausted air is 35.3 m/sec, capacity is 1560 m³/h, max. discharge at the inlet is 1570 PA</p> <p>2.2 kW, speed of exhausted air of dust extraction is 26 m/sec, production is 4600 m/min, voltage is 400 V</p>	<p>Purpose: removal of dust, sawdust and shavings from the machine</p> <p>Topics: Environmental aspects of technical devices using in wood-working shops.</p> <p>Wood materials and its using in manufacture of joiner and furniture products.</p> <p>Rules of selection and use of wood materials for manufacture of joiner and furniture products.</p> <p>Ways of billets mechanical processing for joiner and furniture products.</p> <p>Corrective adjustment of equipment.</p> <p>Rules of work safety and industrial hygiene</p>	<p>BGPM 01 BGPM 03 BGPM 07 PM 01 PM 02 PM 03 PM 04 PM 05 PM 07 PM 10 PM 11 PM 12</p>	
			Manual electrified tool		
14	Cordless manual fretsaw	<p>Accumulator Li-ion, 18V, 3Ah</p> <p>Idle frequency, min-1 0 — 2600</p> <p>Saw stroke is 26 mm</p> <p>Depth of saw cut, mm in wood: 135 steel: 10</p> <p>Weight is 2,7 kg</p> <p>Carbon brush CB430</p>	Creation of rough billets for subsequent fine milling on the milling machine		
15	Cordless drill-screw driving machine	<p>Accumulator NiCd 9,6 V</p> <p>Rotational moment is 24 Nm</p> <p>Rotation periods 0 - 400/0 - 1.300 min⁻¹</p> <p>Weight is 1.5 kg</p>	Drilling of holes for screws when furniture assembling, screws screwing.		

16	Manual milling machine	<p>Number of rotations is 6000-27000 r/min Collet Chuck is 12 mm Tool clamping 6-8-12 mm Weight is 3.0 kg Spindle-keylock for easy replacement of cutter Depth stop with locking Electronic adjustment of rotation</p>	Milling of overhangs of edge materials on the coated edges	
17	Skill saw	<p>Power is 1.3 kW, disc diameter is 185 mm, 220 volt, max height of sawn material is 63 mm (at 90°)</p>	Transversely sawing of sawn wood products	
18	Electrical jointer plane	<p>Max. thickness of removed layer is 2 mm, working width is 82 mm, Max number of rotations is 16000 r/min</p>	<p>Operations: Processing of wood block. Creation of base and chipping to size. Topics: Wood materials and its using in manufacture of joiner and furniture products. Rules of selection and use of wood materials for production of joiner and furniture products. Ways of billets mechanical processing for joiner and furniture products. Rules of selection and use of wood-cutting tool for manual electrical milling machines. Observance of technological modes. Pre-starting procedures of manual electric tool. Methods of work, minor repair of manual electrical jointer planes, rules of work safety and industrial sanitation when working with manual electric tool.</p>	<p>BGPM 01 BGPM 02 BGPM 03 BGPM 04 BGPM 05 PM 01 PM 02 PM 03 PM 04 PM 05 PM 07 PM 08 PM 10 PM 11 PM 12 MO 01</p>

19	Manual electric machine for grinding and polishing with dust collector	Amplitude of oscillation is 1.25 mm, Max. number of oscillations is 24000 number/min, Min. number of oscillations is 15000 number/min Nozzle: round, diameter is 90-125 mm, angular	<p>Operations: grinding and polishing of wood, wood materials, metal.</p> <p>Topics: Wood materials and its using in manufacture of joiner and furniture products.</p> <p>Rules of selection and use of wood materials for production of joiner and furniture products.</p> <p>Ways of billets mechanical processing for templates, joiner and furniture products.</p> <p>Rules of selection and use of wood-cutting tool for manual electrical milling machines.</p> <p>Observance of technological modes.</p> <p>Prestarting procedures of manual electric tool.</p> <p>Methods of work, minor repair of manual circular saws, rules of work safety and industrial sanitation when working with manual electric tool.</p>	BGPM 01 BGPM 02 BGPM 03 BGPM 04 BGPM 05 PM 01 PM 02 PM 03 PM 04 PM 05 PM 07 PM 08 PM 10 PM 11 PM 12
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MANUAL PNEUMATIC TOOL			
20	Spray gun (paint-spraying pistol), pneumatic	<p>A kit of replacement nozzles 1.4; 1.7; 1.9; 2.1 mm</p> <p>Recommended inlet pressure is 1.5-2.5 bar</p> <p>Air consumption (under the pressure of 2.0 bar) - 275 350 L/min</p> <p>Volume of plastic tank is 0.6 L</p>	<p>Operations: Coating of paintwork material to the surface of work- pieces and products of wood and wood-based plates.</p> <p>Topics: Wood mate- rials and its using in manufacture of joiner and furniture products. Rules of selection and use of wood materi- als for production of joiner and furniture products. Rules of selection and use of paintwork materials for finishing of joiner and furniture products. Observance of techno- logical modes in man- ufacture of finishing works. Pre-starting procedures of manual pneumatic machines. Methods of work, mi- nor repair of manual pneumatic machines, rules of work safety and industrial sani- tation when working with manual electric tool.</p> <p>BGPM 01 BGPM 02 BGPM 03 BGPM 04 BGPM 05 BGPM 05 PM 01 PM 02 PM 03 PM 04 PM 05 PM 06 PM 07 PM 08 PM 10 PM 11 PM 12</p>

10. The list of the recommended literature

№	Name and edition number	Author	Publisher, year and place of publication	Module (-s) wherein it is used
1. 1	Woodworking machine	Korotkov V. I.	Professional education, M. 2003	Rules and working method on woodworking equipment Technology of manufacturing and assembly of joiner and furniture products from various materials. Organization of works on safety and labor protection on sites and in the shops of woodworking and furniture enterprises Designing of sites and shops of woodworking and furniture enterprises
2. 2	Woodworking technology	Rykulin S. N. Kandalina L. N.	Professional education, M. 2005	Rules and working method on woodworking equipment Rules and methods of technical measurements performing in woodworking. Technology of manufacturing and assembly of joiner and furniture products from various materials. Organization of works on safety and labor protection on sites and in the shops of woodworking and furniture enterprises Designing of sites and shops of woodworking and furniture enterprises
3. 3	Woodworking machines and tools	Amalitsky V.V.	Academy, M. 2002	Rules and methods of work by electric hand tool, main operations in manufacture of joiner and furniture products. Rules and methods of work on woodworking equipment Technology of manufacturing and assembly of joiner and furniture products from various materials. Organization of work on safety and labor protection on sites and in the shops of woodworking and furniture enterprises Designing of sites and shops of woodworking and furniture enterprises
4. 4	Manufacture of joiner and furniture products	Bobikov P.D.	Professional education, M. 2000	Rules and methods of work on woodworking equipment

5.	Technology of carpentry, joinery, glass and parquetry works	Stepanov B.A.	Initial professional education, M. 2006	Rules and methods of implementation of joiner connections in manufacture of wood products Rules and methods of works implementation on furnishing of joiner and furniture products
6.	Foreman of joiner and furniture manufacture	Klyuyev G.I.	Academy, M. 2008	Rules and methods of technical measurements performing in woodworking. Rules and methods of implementation of joiner connections in manufacture of wood products Rules and methods of works implementation on furnishing of joiner and furniture products
7.	Materials of woodworking industries	Bartashevich A. A. Ignatovich L. V.	«RIPO», M. 2013	Acceptance, selection and use of timber and timber-based materials in work Rules and methods of works implementation on furnishing of joiner and furniture products Selection and use of fasteners, fittings, accessories and auxiliary materials for joiner and furniture products manufacture Manufacturing technology and assembly of joiner and furniture products from various materials.
8.	Furniture designing	Strezhnev Yu. F.	«Profi», St. Petersburg, 2009	Manufacturing technology and assembly of templates and accessories Manufacturing technology and assembly of joiner products Manufacturing technology and assembly of cabinet furniture Manufacturing technology and assembly of structural furniture Manufacturing technology, assembly and upholstery
9.	Labor safety in construction industry	Kulikov O.N.	«Academy», M. 2003	Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises
10.	Materials science for professions involved in wood processing	Stepanov B.A.	«Academy», M. 2006	Acceptance, selection and use of timber and timber-based materials in work Selection and use of fasteners, fittings, accessories and auxiliary materials for joiner and furniture products manufacture

11. 11	Furniture designing	Bartashevich A. A. Trofimov S.P.	«Modern school», M. 2006	Designing and construction of joiner and furniture products with the use of the software Manufacturing technology and assembly of joiner and furniture products from various materials Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises
12. 12	Information technology	Balafanov E.K., Buribayev B., Dauletkulov A. B	Almaty, INT, 2009	Manufacturing technology and assembly of joiner and furniture products from various materials. Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises Designing of sites and shops of woodworking and furniture enterprises Manufacturing technology and assembly of joiner and furniture products Marketing research and identification of needs in manufacture of new products
13. 13	Fundamentals of economics	Chayzhunusova G.	Astana, Foliant, 2010	Marketing research and identification of needs in manufacture of new products Manufacturing technology and assembly of joiner and furniture products from various materials. Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises
14. 14	Labor safety in construction industry	Sukhachev A. A	Moscow, Knorus, 2013	Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises Organization of work on ecological safety of enterprises
15. 15	Economics of labor safety	Nurhasarova M, Ryskulova B., Turgumbaeva Kh.	Astana, Foliant, 2010	Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises Marketing research and identification of needs in manufacture of new products
16.16	Technology of construction processes and building	Vilman Yu. A.	ACB Publisher, 2014	Designing of sites and shops of woodworking and furniture enterprises

17	Graphics for builders	Yakubovich A. A.	Graphics task for builders, 2000	Designing of sites and shops of woodworking and furniture enterprises
18	Designing of reinforced concrete, masonry and reinforced masonry structures	Frolov A.K., Bedov A. I., Shpanova V. N., Rodina A. Yu., Frolova A.K	Association of construction universities, 2007	Designing of sites and shops of woodworking and furniture enterprises Marketing research and identification of needs in manufacture of new products
19	Building structures	Serbin E. P.	“Academy“ Publishing center, 2014	Manufacturing technology and assembly of joiner and furniture products Designing of sites and shops of woodworking and furniture enterprises
20	Project management	Afonin A. M., Tsaregorodtsev Yu. N., Petrova S. A.	FORUM, 2010	Designing of sites and shops of woodworking and furniture enterprises Marketing research and identification of needs in manufacture of new products
21	Technology processes in construction	Kirnev A.D.	Rostov n/H: Feniks, 2013	Manufacturing technology and assembly of joiner and furniture products Marketing research and identification of needs in manufacture of new products
22	Technical graphics with the elements of programmed education	Vyshnepolsky I. S.	M: Mechanical engineering, 2005	Manufacturing technology and assembly of joiner and furniture products Designing of sites and shops of woodworking and furniture enterprises

23	Tasks for structural and topographic graphics	Briling N. S.	M, "Education", 2005.	Designing of sites and shops of woodworking and furniture enterprises
24	Utilization of industrial waste	Palgunov P. P., Sumarokov M. V.	M: Building publisher, 1990	Organization of work on ecological safety of enterprises
25	Technological processes of ecological safety	Rodionov A. I., Klushin V. N., Sister V. G	Publisher of Bochkareva N., Kaluga, 2000	Organization of work on ecological safety of enterprises
26	Fundamentals of environmental law	Study guide	Moscow, M; Shiet-M, 1999	Organization of work on ecological safety of enterprises
27	Fundamentals of environmental insurance	Motkin G.A.	Moscow. Science, 1996	Organization of work on ecological safety of enterprises Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises
28	Wood science. Forest commodity science. Basics of converted timber drying	Sergeev V. V., Vasilyev N. L., Soldatov A. V., Course of lectures.	Yekaterinburg: USFEU, 2008.	Acceptance, selection and use of timber and timber-based materials in work Rules and methods of work on woodworking equipment

29	Materials for facing and furnishing of joiner and furniture products for vocational schools	Savchenko V.F.	M. «Academy» Publisher, 1999	Rules and methods of work implementation on facing and finishing of joiner and furniture products
30	Equipment and tools of woodworking enterprises	Amalitsky V.V., Sanev V.I.	M.: Ecology, 1992.	Rules and methods of work on woodworking equipment. Manufacturing technology and assembly of joiner and furniture products. Designing and construction of joiner and furniture products with the use of the software. Development and organization of technological 331 process for manufacture of joiner and furniture products. Performing of calculations on consumption of raw materials, materials, equipment according to technological process of manufacture of joiner and furniture products.
31	Equipment for wood products bonding	Study guide, Glebov I. T., Novoselov V. G	Yekaterinburg, 2000	Rules and methods of work on woodworking equipment. Manufacturing technology and assembly of joiner and furniture products.
32	Principles of design of wood products	Study guide, Radchuk L. I.	M, MSFU, 2006	Rules and methods of technical measurements performing in woodworking. Development, design and interpretation of drawing and sketches of products. Designing and construction of joiner and furniture products with the use of the software.
33	Woodworking technology. Terms and definitions	Study guide, Glebov I. T., Rysev V. E.,	USFEU, 2005	Development and organization of technological process for manufacture of joiner and furniture products. Manufacturing technology and assembly of joiner and furniture products.

34	Reference book for woodworking	Bobrov V.A.	Feniks Publisher, 2003.	<p>Development and organization of technological process for manufacture of joiner and furniture products.</p> <p>Manufacturing technology and assembly of joiner and furniture products.</p> <p>Performing of calculations on consumption of raw materials, materials, equipment according to technological process of manufacture of joiner and furniture products.</p> <p>Designing of sites and shops of woodworking and furniture enterprises.</p> <p>Acceptance, selection and use of timber and timber-based materials in work.</p> <p>Rules and methods of work by electric hand tool.</p> <p>Rules and methods of work on woodworking equipment.</p> <p>Selection and use of fasteners, fittings, accessories and auxiliary materials for joiner and furniture products manufacture.</p>
35	Safety in woodworking enterprises	Nikitin L.I.	M.1982	<p>Manufacturing technology and assembly of joiner and furniture products.</p> <p>Designing of sites and shops of woodworking and furniture enterprises.</p> <p>Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises.</p>
36	Wood science and forest commodity science	Ugolev B.N.	College Textbook., M.: Ecology, 1991.	<p>Development and organization of technological process for manufacture of joiner and furniture products.</p> <p>Manufacturing technology and assembly of joiner and furniture products.</p> <p>Acceptance, selection and use of timber and timber-based materials in work.</p>

<p>Russian-Kazakh-English dictionary of architectural and structural terms (with interpretation in Russian language), in 4 books.</p>	<p>Under general editorship of Kusainova A.A.</p>	<p>Almaty, Kazakh Leading Academy of Architecture and Construction, 2012</p>	<p>Rules and methods of technical measurements performing in woodworking. Development, design and interpretation of drawing and sketches of products. Acceptance, selection and use of timber and timber-based materials in work. Manufacturing technology and assembly of joiner and furniture products. Designing and construction of joiner and furniture products with the use of the software. Development and organization of technological process for manufacture of joiner and furniture products. Performing of calculations on consumption of raw materials, materials, equipment according to technological process of manufacture of joiner and furniture products. Fundamentals of economics of production at woodworking enterprise. Designing of sites and shops of woodworking and furniture enterprises. Organization of work on safety and labor protection on sites and in shops of woodworking and furniture enterprises. Organization of work on ecological safety of enterprises. Organization and management of production activity in the frame of organization unit. Marketing research and identification of needs in manufacture of new products.</p>
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