

**MINISTRY OF LABOR AND SOCIAL PROTECTION OF THE  
POPULATION OF THE REPUBLIC OF KAZAKHSTAN**

**“DEVELOPMENT OF LABOR SKILLS AND STIMULATION OF  
WORKPLACES” PROJECT**

**EDUCATIONAL PROGRAM**

**1306000-Radioelectronics and communications**

(code and name of the specialty)

**Professional Qualification Level: Applied Bachelor**

**Duration of training: 2 years 10 months.**

**Astana, 2018**

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## INTRODUCTION

The President of the country N.A.Nazarbayev in the message to the people of Kazakhstan 2018: “It is necessary to develop modern standards in all major professions. In these standards, employers and businesspersons clearly consolidate what knowledge, skills and competences should have the employees. You need, based on the requirements of the professional standards, to develop new or update existing educational programs”.

This educational program is developed based on the basic normative documents defining the training content by specialty 0000000 – “Mobile Communication Systems”:

- State compulsory standard for technical and vocational education, approved by the Government Decree of the Republic of Kazakhstan dated August 23, 2012, No. 1080 (as amended as of 15.08.2017);
- National Qualifications framework, approved by the Protocol dated March 16, 2016;

A distinctive characteristic of this educational program is compliance with requirements of professional social order through the creation of generic and professional competences associated with essential practical activity.

Based on the present Education Program the education institution develops working programs and curricula, using appropriate methodological recommendations for the working educational and planning documentation.

The program is designed to implement the principles of democratic administration of education, expanding the boundaries of academic freedom and the authority of the educational institutions that will ensure the adaptation of the system of technical and vocational education to the changing needs of society, the economy and the labor market. The program flexibility will take into account the ability and needs of the individual, production and society.

The educational program includes the use of modular competence-based approach based on developing and evaluating competence of students of the educational institutions in the form of basic educational outcomes, use of a module training.

## LIST OF SYMBOLS AND ABBREVIATIONS

AC	Academic Committee
BC	Basic competence
BM	Basic module
HE	Higher education
SCES	The State compulsory education standard
ERC	European qualification frame
ETF	The European Training Foundation
K&S	Knowledge & skills
NOC	National classifier of occupations
NQF	National Qualifications framework
NSC	National qualifications system
GHM	General Humanitarian Module
GCEA	General classifier of types of economic activity
GM	General module
EP	Educational program
GPM	General Professional Module
SQF	Sectorial Qualifications framework
PS	Professional standard
PVO	Graduate education
PC	Professional competence
PM	Professional module
WG	Working Group
RK	The Republic of Kazakhstan
LO	Learning Outcome
SM	Special module
QMS	Quality management system
SEM	Socio-economic module
TVET	Technical and vocational education and training
TVE&PS	Technical and Vocational Education and Post-Secondary Education
SSDD	Single System For Design Documentation
SSPD	Single System for Process Documentation

## PASSPORT OF THE WORKING EDUCATIONAL PROGRAM

**Name (*specialty code and name*):** - 1306000 Radio engineering and communications

**Name and code:** 1306134 – “Applied Bachelor of radio technician”

**The Purpose of the education program:** Provision of training for applied bachelors that organizing and planning work on maintenance of radio electronic equipment, as well as modeling and development of methods that ensure the growth of technical characteristics.

**Level of education:** technical and vocational

**Professional qualification:** Applied undergraduate

**Skill levels on NQF/SQF:** 5

**Professional Area activity \*:**

**Type (s) of employment:**

**Object (s) of professional activity:**

**Program Feature\*\*\*\*:** The possibility to use dual forms of training credit system.

**Form of study:** full-time

**Training dates:** 2 years 10 months.

**Language of Training** Russian

**The volume of credits/hours:** 165 credits/4950 hours

**Requirements for students \*:** persons with basic secondary education

\*Specifies the parameters of the SQF (methodical recommendations on the development and design of sectorial qualification frameworks, Astana, 2016).

\*\* Specifies according to PS (methodical recommendations on the design and execution of professional standards, Astana, 2017)

\*\*\*Specifies the system objects (objects), phenomena, processes, and technology that aims activities.

\*\*\*\*Specifies the dual education/distance training/credit technology

\*\*\*\*\* Specifies the previous education: basic secondary/secondary/technical and vocational education

## Competency profile

<p><b>The purpose of the training :</b> Organization and planning maintenance of the radio-electronic equipment, as well as modeling and design methods, increasing performance.</p>	<p>After the successful completion of the program , <b>the trainee</b> will be able to organize and plan work for maintenance of the radio-electronic equipment, modeling and design methods, increasing technical specifications</p>	
<p>The name of the section, section, group, class and subclass according to GCEA * (professional standard):</p>	<p>Section: information and communication Section: (61) Communications Group: (612) wireless telecommunications activities Class: (6120) wireless telecommunications activities</p>	
<p>The scope of competencies (core labor functions of professional standard or analysis profession) **</p>		
<b>Basic Competence</b>		
Competency code	Competence (in line with labor functions)	Module
BC 1	Apply professional vocabulary, drawing up business papers in the field of professional activity.	BM 1. Application of professional vocabulary in the field of professional activity
BC 2	Develop and improve physical qualities	BM 2. Development and improvement of physical qualities
BC 3	Apply of the foundations of social sciences for socialization and adaptation in society and the work place	BM 3. Application of the foundations of the social sciences for socialization and adaptation in society and the work place.
BC 4	Read drawings	BM 4. Reading drawings
BC 5	Apply the basic knowledge of economics in professional activities	BM 5. Application of basic knowledge of economics in professional activities
BC 6	Understand the history, role and place of Kazakhstan in the world community	BM 6. Understanding the history, role and place of Kazakhstan in the world community



BC 7	Apply digital devices and microprocessor systems in communication technology	BM 7. Application of digital devices and microprocessor systems in communication technology
BC 8	Comply with safety regulations and labor protection	BM 8. Compliance with safety regulations and labor protection
<b>Professional Competence</b>		
PC1	Organize work on the assembly, installation and dismantling of electronic equipment	PM 1. Organization of work on the assembly, installation and dismantling of electronic equipment
PC 2	Organize work on setting up and adjusting devices, units and devices of radio-electronic equipment	PM 2. Organization of work on setting up and adjusting devices, units and devices of electronic equipment
PC 3	Organize work on the repair of electronic equipment	PM 3. Organization of work on the repair of electronic equipment
PC 4	Organize work on the diagnosis of analog and digital devices and blocks of radio-electronic equipment.	PM 4. The organization of work on the diagnosis of electronic equipment.
PC 5	Plan tests of electronic equipment	PM 5. Planning standard tests of devices, units and devices of electronic equipment
PC 6	Organize work on checking the status of equipment received from repairs	PM 6. Organization of work on checking the status of equipment received from repair
PC 7	Monitor the causes and nature of defects	PM 7. Monitoring of the causes and nature of defects
PC 8	Develop and execute design and technical documentation and other regulatory. technical documents in accordance with the requirements of standards, SSDD, SSPD and other regulatory and technical documents	PM 8. Development and execution of design and technical documentation and other regulatory and technical documents in accordance with the requirements of standards, SSDD, SSPD and other regulatory and technical documents
PC 9	Develop prospective technical requirements to design radio- equipment	PM 9. Development of prospective technical requirements to the design of radioelectronic equipment

\* The general classification of economic activities (GCEA) is a document intended for classification and coding of all economic activities.

\*\* A brief description of labor functions that allow you to achieve the main objectives of the specialty/profession. Number of functions depends on the complexity of the profession.

## LIST OF MODULES AND LEARNING OUTCOMES

Module name	Learning outcomes (in accordance with the professional tasks)	Assessment Criteria of training outcomes	Module forming disciplines
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### BASIC MODULES

BM 1. Application of professional vocabulary, the preparation of business papers in the field of professional activity	LO 1. To know the grammar and terminology of Kazakh (Russian) and foreign language for communication in the sphere of one's professional activity	1. Knowing of Lexico-grammatical material, necessary for professional communication	Introduction to specialty
		2. Knowing the grammatical material in the specialty	
		3. The use of terminology in the specialty.	
BM 1.	LO 2. To master the translation technique (with a dictionary) of professional-oriented texts	1. Reading professional texts	Introduction to specialty
		2. Translation (with a dictionary) of professional texts	
		3. Development of a special vocabulary of foreign language vocabulary of professional orientation	
BM 1.	LO 3. To work with organizational, administrative and informational documents using computer technology	1. Drawing up in Kazakh (Russian) and foreign languages a resume, autobiography, description, statement, complaint, power of attorney, receipt	Introduction to specialty
		2. Compliance with textual requirements	
		3. Creation of documents on the computer that meet modern requirements and established regulations	
BM 2. Development	LO 1. To strengthen	1. Understanding and adhering to the	Physical culture

and improvement of physical qualities	health and healthy lifestyle	<p>fundamentals and culture of a healthy lifestyle</p> <p>2. Characteristics of the physiological basis of the respiratory, circulatory and energy supply systems under muscle loads</p> <p>3. Performing a set of exercises for general physical training</p>	
	LO 2. To improve physical qualities and psycho-physiological abilities	<p>1. Characteristics of the foundations of physical activity and methods of its regulation</p> <p>2. Selection and application of methods and means of physical culture to improve the basic physical qualities</p> <p>3. Implementation of control standards and tests provided by the program</p>	
	LO 3. To provide first aid for injuries and accidents	<p>1. Understanding the causes of injury during exercise</p> <p>2. Using injury prevention methods</p> <p>3. Providing medical care for injuries</p>	
BM 3. Application of the foundations of social sciences for socialization and adaptation in society and the work place	LO 1. Possess basic concepts and information of philosophy, political science, cultural studies and sociology	<p>1. Understanding the essence and essence of the concepts, categories and information of philosophy, political science, cultural studies and sociology</p>	<p>Basic Philosophy</p> <p>Cultural Studies</p> <p>Law basics</p> <p>Fundamentals of sociology and political science</p>
		<p>2. Identification of problems and interrelations of the main categories and concepts of philosophy, political science, cultural studies and sociology</p>	
	<p>3. Analysis of various points of view</p>		
	LO 2. To understand international	<p>1. Characteristics of the structure of the political system, history and the</p>	

	political processes, the geopolitical situation and moral values, and the norms that form tolerance and an active personal position	current state of the world and traditional religions	
	LO 3. To know basic concepts and information about the main branches of law	2. Determining differences in extremist, radical and terrorist ideologies	
		3. Tolerant perception of social, ethnic, religious and cultural differences	
		1. Knowing of the basic provisions of criminal, civil and family law and information about taxes	
		2. Understanding of responsibility for administrative and corruption offenses and respect for the principles of law and order	
		3. Protection of rights in accordance with the labor law	
BM 4. Reading drawings	LO 1. To know the rules of design and engineering documentation (SSDD)	1. Know the main concepts of basic technological drawing	Technical drawing.
		2. Understanding of a unified system of design documentation	
		3. Formulation of design rules	
	LO 2. To design SSDD in accordance with the main standards of SSPD	1. Definition of the scale of the implementation of the drawing of technical details	
		2. Possession of skills of SSDD design.	
		3. Drawings in accordance with the main standards SSDD	
	LO 3. To perform design on the flat.	1. Reading assembly drawings and circuit diagrams	
		2. Possession of design skills on the plane	

		3. Execution of schemes of drawings with projection on the plane.	
BM 5. Application of basic knowledge of economics in professional activities	LO 1.To determine the forms and types of ownership, types of plans, basic economic indicators of the enterprise	1. Understanding of the laws and principles of a market economy, tax policy, sources of inflation, the main stages and content of planning	Basics of economics
		2.Perform the necessary economic calculations using mathematical methods to determine the main economic indicators of the enterprise	
		3. Determination of the main economic indicators of the enterprise	
	LO 2.To understand the development trends of the world economy, the main objectives of the transition to a green economy	1. Characteristics of the trends of the world economy	
		2. Understanding the main objectives of the state transition to a "green" economy	
		3. Applying the basic methods of calculating gross domestic product and gross national product for the state's transition to a green economy	
	LO 3. To determine the possibility of success and the risk of entrepreneurship	1. Characteristics of goals, factors, conditions, organizational and legal forms of entrepreneurial activity	
		2. Understanding the factors that determine entrepreneurial success	
		3. Drawing up a business plan	
BM 6. Understandin		1. Understanding the essence of historical events	History of Kazakhstan

g the history, role and place of Kazakhstan in the world community	LO 1. To know the main historical events	from antiquity to the present	
		2. Disclosure of the role and place of the Kazakh people in the common Turkic community, in the system of nomadic civilization, in the development of the historical and cultural community of the peoples of the Eurasian world	
		3. Chronology of major historical events	
	LO 2. To identify cause-effect relationships of historical events.	1. Understanding the facts, processes and phenomena of historical events	
		2. Determination of the main facts, processes and phenomena that reflect and characterize the integrity and consistency of the history of Kazakhstan	
		3. Establishing causal relationships of historical events	
	LO 3. To assess the achievements of independent Kazakhstan	1. Understanding the nature and purpose of political and social changes taking place in the Republic of Kazakhstan after independence	
		2. Characteristics of the achievements of independent Kazakhstan	
		3. Evaluation of the achievements of independent Kazakhstan	
BM 7. Application of digital devices and microprocessors or systems in	LO 1. To work with information on the Internet	1. Understanding the technical aspects of using the Internet and the concept of copyright	Computer technologies
		2. Compliance with the principles of the Internet	

communication technology		community and the code of conduct on the Internet	
		3. Determining the reliability of information	
	LO 2. To communicate on the Internet	1. Evaluation and analysis of sites	
		2. Manage social networks, avatar, online reputation.	
		3. Getting information about the code of the digital world, the virtual world, about aggression on the Internet	
	LO 3. To implement digital consumption	1. Understanding of Online Advertising, Online Fraud	
		2. Understanding of phishing, online gaming	
		3. Use of online stores, signs of reliability, consumer rights	
	BM 8. Compliance with safety regulations and labor protection.	LO 1. To know basic concepts, methods of first aid and methods of protection in emergency situations	1. Understanding of legal, regulatory, technical and organizational foundations of life safety in emergency situations
2. Knowledge of fire and industrial safety rules, rules of conduct, methods and means of protecting people in emergency situations (accidents, catastrophes, natural disasters)			
3. Recognition of the main natural and man-made hazards			
LO 2. Comply with safety regulations, fire safety and anti-terrorism security requirements		1. Assessment of the risk of occurrence of hazards associated with violations of safety regulations, fire safety, anti-terrorism protection requirements and emergency situations	
		2. Knowledge of requirements for ensuring	



		fire safety when servicing telecommunications networks.	
		3. Compliance with safety precautions and precautions when performing maintenance of telecommunications networks.	
	LO 3. To apply first aid techniques, methods of protection in emergency situations	1. Formation and deepening of knowledge and understanding in the need to use first-aid techniques, methods of protection in the face of danger to life in emergency situations in their professional activities	
		2. Consistent perception, evaluation, comparison and analysis of information and its use for the practical solution of professional tasks	
		3. Application of practical skills to ensure safety in dangerous situations of everyday life and in emergency situations of different nature	

### PROFESSIONAL MODULES

PM 1 Work organization for assembly, installation and dismantling of the radio-electronic equipment	1. To plan diagram of the radio-electronic equipment	1. Building of a diagram of the radio-electronic equipment	Materials science, electric radio materials and radio components Life safety Technology installation devices, blocks and radio-electronic
		2. Description of the principle of the work of the scheme	
		3. Transfer of destination schema elements	
	2. To monitor the application of measuring instruments for	1. Monitoring the use of instrumentation and radio assembling and safety devices	

	radio assembling and Assembly, erection and dismantling	2. Transfer of assignments used instrumentation and radio assembling devices	devices technology Assembly
		3. Analysis of the characteristics and parameters of schema elements	technology devices, blocks and radio-electronic devices technology Manufacturing practice Management
	3. To plan activities for the Assembly, installation and dismantling of devices, appliances and radio-electronic equipment blocks	1. Analysis of the design of radio-electronic equipment	
		2. Selection of radio assembling and Instrumentation	
		3. Selection of radioelements scheme	
PM 2 Organization of works on setting up and adjusting devices, blocks and radio-electronic devices technology	1. To prepare radio calculations of various electrical and electronic circuits	1. Identification of the technical specifications and parameters of schema elements	Methods of operation of the control and measuring equipment and technological equipment Assembly and installation Techniques for tuning and adjusting devices and radio-electronic equipment blocks Manufacturing practice Management
		2. Identification of the mathematical formulas for calculating technical parameters and characteristics of circuit elements for a particular type of radio-electronic equipment	
		3. Collection and analysis of calculation results	
	2. To plan activities for the verification of characteristics and preferences devices and	1. A comparison of the results of the validation of the technical characteristics and parameters of settlement data	

	radio-electronic equipment	2. Analysis of the causes of the differences calculated data and test results	
		3. Addressing the causes of differences between calculated data and test results	
	3. To organize settings and adjustment devices and blocks of radio electronic equipment according to specifications	1. Listing appointments and principles of measuring instruments	
		2. Taking into account of the technical conditions and instructions on custom and adjustable radio-electronic technique	
		3. Control of settings and adjustment of the technical parameters and characteristics of circuit elements according to calculations	
PM 3 Work organization on repair of the radio-electronic equipment.	1. To analyze the dysfunctional schema elements	1. Enumeration of principles of schema elements	Materials science, electric radio materials and radio components Life safety Technology installation devices, blocks and radioelectronic devices technology Manufacturing practice Management
		2. Enlisting of the parameters schema elements	
		3. Measurement of parameters elements in the schema	
		4. Comparison of the elements of the list with the results of the measurement	
	2. To organize activities to repairs	1. Disposal of old schema elements	
		2. Buying a new schema elements	
		3. Control repair unhealthy elements in the schema	
3. To keep a record of the	1. Integration of the replaced schema elements		

	repaired radio-electronic equipment	2. Treatment of unhealthy settings schema elements	
		3. Accounting from renovated schema elements	
PM 4. Organization of work on the diagnosis of electronic equipment.	LO 1. To organize activities to control the parameters of electronic equipment in the process of operation	1. Analysis of parameters of electronic equipment in the process of operation	Theoretical bases of diagnostics of detection of failures and defects of various types of electronic equipment The theoretical basis for the repair of various types of electronic equipment Internship Management
		2. Verification of the results of measurements of parameters of radio-electronic equipment in the process of operation with a list of technical parameters of radio-electronic equipment	
		3. Control of setting parameters of electronic equipment in accordance with the list of technical parameters	
	LO 2. To apply software when conducting diagnostics of electronic equipment	1. Enumeration of software for diagnostics of radio-electronic equipment	
		2. Knowing the operation of a personal computer	
		3. Analysis of the state of the equipment and evaluation of its performance	
	LO 3. To create diagnostic algorithms for electronic equipment	1. Planning the procedure for the diagnosis of electronic equipment	
		2. Display of the diagnostic results	
		3. Analysis of diagnostic results	
	PM 5	LO 1. To determine the	

Planning of standard tests of devices, units and devices of electronic equipment	method of testing electronic equipment.	2. Analysis of individual characteristics of electronic equipment	Methods for testing electronic equipment Basics of Radio Engineering Methods and means of testing electrical measuring instruments Methods and technologies for testing radio-electronic equipment Internship Management		
		3. Organization of tests on the nature of external influences			
	LO 2. To analyze the causes of failure of electronic equipment during testing	1. Monitoring the performance of each circuit element			
		2. Checking the settings and adjustments of the radio			
		3. Analysis of the causes of failure of electronic equipment			
	LO3. To draw conclusions based on test results.	1. Listing the requirements for the parameters of electronic equipment			
		2. Determination of the working conditions of electronic equipment			
		3. Evaluation of the performance of electronic equipment			
	PM 6 Organization of work on checking the status of equipment received from repair	1. To organize events for the verification of the state of equipment received from the repair		1. Testing the performance of electronic equipment	Fundamentals of engineering in telecommunications Theory of telecommunications Theory of electrical circuits in telecommunications Technical pest control work radio equipment, perspectives and directions
				2. Analysis of parameterov elements in the schema	
3. Verifying results with data from the technical documentation of the radio-electronic equipment					
2. To keep records and analysis of parameters of radio-electronic equipment use		1. Verification of compliance with the rules of technical operation and care for electronic equipment			
		2. Identification of installation or dismantling electronic equipment circuits			

		3. Identification of the replacement schema elements radio-electronic equipment	of their improvement Manufacturing practice Management
	3. To evaluate the technical condition of the electronic equipment	1. Determination of the level of wear radio-electronic equipment	
		2. Expects further service life electronic equipment	
		3. Technical condition assessment Explains the radio-electronic equipment	
PM 7  Analysis the causes and nature of defects occurrence	1. To determine the nature of the occurrence of different types of defects	1. Identification of the nature of the occurrence of structural types of defects	Fundamentals of engineering in telecommunications Theory of telecommunications Theory of electrical circuits in telecommunications Technical pest control work radio equipment, perspectives and directions of their improvement Manufacturing practice Management
		2. Identification of the nature of the occurrence of production types of defects	
		3. Identification of the nature of the occurrence of operational defects types	
	2. To conduct an analysis of the causes of vzniknovaenija of different types of defects	1. Analysis of the causes of structural types of defects	
		2. Analysis of the causes of industrial types of defects	
		3. Analysis of the causes of operational defects types	
	3. To work with design, engineering and technical documentation	1. Analysis of project documentation of the radio-electronic equipment	
		2. Analysis of the technical documentation of the radio-electronic equipment	
		3. Analysis of design documentation of the	

		radio-electronic equipment	
PM 8 Development and execution of design and technical documentation and other regulatory and technical documents in accordance with the requirements of standards, GOST, ESKD and other regulatory and technical documents	1. To develop instructions for use of the radio-electronic equipment	1. Analysis of the rules for the operation of the radio-electronic equipment	Fundamentals of engineering in telecommunications Theory of telecommunications Theory of electrical circuits in telecommunications Technical pest control work radio equipment, perspectives and directions of their improvement Manufacturing practice Management
		2. Identification of prohibited acts applicable to radio-technology	
		3. Ensuring the safe operation of the radio-electronic equipment	
	2. To develop a list of technical parameters of the radio-electronic equipment	1. Enumeration of technical parameters of the radio-electronic equipment	
		2. Confirms the correctness of technical parameters	
		3. Determination of the maximum and minimum settings of the radio-electronic equipment to ensure its operability	
	3. To register the technical documentation of the radio-electronic equipment	1. Enumeration of the rules for the operation of the radio-electronic equipment in accordance with the requirements of the standards	
		2. Enumeration of technical parameters of the radio-electronic equipment in accordance with the requirements of the standards	
		3. Transfer requirements standards, SSPD, SSDD and other normative-technical documents	
PM 9 Development of prospective technical	1. To monitor the market new solutions in the field of development	1. Identifying sources of information for the monitoring of the market of the radio-electronic equipment	Fundamentals of engineering in telecommunications

requirements to the design of radioelectronic equipment	radio equipment	2. The allocation of the necessary information	Theory of telecommunications Theory of electrical circuits in telecommunications Technical pest control work radio equipment, perspectives and directions of their improvement Manufacturing practice Management
		3. Systematization of information received	
	2. To perform calculations on the project in accordance with the technical assignment	1. identification of the technical specifications	
		2. Technical calculations to improve the technical characteristics of radio-electronic equipment	
		3. Experiments using calculations performed	
	3. To develop forward-looking technical requirements to design radio- equipment	1. Identification of alternative requirements to design radio- equipment	
		2. Generating ideas to improve technical characteristics of radio-electronic equipment	
		3. Opposition between developed prospective technical requirements with previous	



#### 4.1 Specification of the basic module 1 “Application of professional vocabulary and business writing in the state language”

Sphere of competence	-
Name of module	Application of professional vocabulary in the field of professional activity, preparation of business papers in the state language
Purpose of module	After studying this module, the student will be able to apply professional vocabulary, make business papers in the state language
Level of professional qualification	5
Learning outcomes by module	<ol style="list-style-type: none"> <li>1. To know the grammar and terminology of the Kazakh (Russian) and foreign languages for communication in the sphere of their professional activities;</li> <li>2. To master the translation technique (with a dictionary) of professional-oriented texts;</li> <li>3. To work with organizational, administrative and informational documents with the use of computer technology.</li> </ol>
Summary of content (sections, topics)	<ol style="list-style-type: none"> <li>1. Knowing of lexical material in the specialty;</li> <li>2. Knowing of grammatical material in the specialty;</li> <li>3. The use of terminology in the specialty;</li> <li>4. Reading professional texts;</li> <li>5. Translation (with a dictionary) of professional texts;</li> <li>6. Development of a special vocabulary of foreign language vocabulary of professional orientation</li> <li>7. Drawing up in Kazakh (Russian) and foreign languages a summary, autobiography, description, statement, complaint, power of attorney, receipt;</li> <li>8. Compliance with the requirements for the text of the document;</li> <li>9. Creation of documents on the computer that meet modern requirements and established regulations.</li> </ol>
Prerequisites	Knowledge of the school course of Kazakh, Russian, foreign language; Introduction to the specialty.

Modules forming the discipline	Professional Kazakh (Russian) Professional foreign language Culture of business communication Office work in state language
Type of module (compulsory, optional)	Compulsory
Labor intensity (credits academic hours)	6 credits /180 hours
Length of module	1-5 semester
Form of education	full time
Technology of education	Module
Forms of educational process organization	Lecture, Student's Individual Work, Practical trainings, problem-solving, reproductive, inductive, case study
Methods of education	Oral interaction, test, report, reference paper, creative task
Forms of control	Pass fail exam, exam
Necessary resources	Personal Computer; software; presentations; electronic resources; support cards; handouts.
Language of instruction	Russian, Kazakh
Postrequisites	PM 1- PM 10

**4.2 Specification of the basic module 2**  
**“Development and improvement of physical qualities”**

<b>Sphere of competence</b>	Basic module
<b>Module Name</b>	Development and improvement of physical qualities
<b>Module purpose</b>	By the end of this module, the student will be able to develop and improve physical qualities.
<b>Proficiency Level</b>	4
<b>Learning outcomes</b>	LO 1. To strengthen health and abide by the principles of a healthy lifestyle; LO 2. To improve physical qualities and psycho-physiological abilities; LO 3. To provide first aid for injuries and accidents.
<b>Summary of content (sections, topics)</b>	1. Understanding and adhering to the fundamentals and culture of a healthy lifestyle; 2. Characteristics of the physiological bases of the activity of the respiratory, circulatory and energy supply systems under muscle loads; 3. Performing a set of exercises for general physical training; 4. Characteristics of the basics of physical activity and methods of its regulation; 5. Selection and application of methods and means of physical culture to improve basic physical qualities; 6. Implementation of control standards and tests provided by the program; 7. Understanding the causes of injury during exercise; 8. The use of methods of injury prevention; 9. Providing first medical care for injuries.
<b>Prerequisites</b>	Physical education
<b>Disciplines forming the module</b>	Physical education
<b>Module type (compulsory, optional)</b>	Compulsory
<b>Workload (credits / academic hours)</b>	6 credits / 180 hours

<b>Duration of the module</b>	1 semester
<b>Form of study</b>	intramural
<b>Education technology</b>	Modular
<b>Forms of educational process organization</b>	Lecture, independent work, practical session.
<b>Teaching methods</b>	Oral questioning, testing, presentation, report, message, interview, essay, creative task, colloquium. project activity, case task
<b>Form of control</b>	Pass fail exam, exam
<b>Necessary resources</b>	<p>Personal computer, software. Interactive board. TV. Audio-video equipment. Sports equipment, trainers and equipment. Library Fund.</p> <p>Kydyrmoldina A. Dene, turbis_ men sport tyrleriniң physiologуk negizderi: оқулық Kazakhstan Respublikasyny Bilim zhyne rylym ministerlili. Almaty 2014</p> <p>Myhamedzhanova Y. Dene shynуқтыru pәninen оқуtu әdistemesi. Оқу құrali. Astana. Foliant. 2011 Dene shynуқтыru dayyndуғуny ң presidenttik tetiler- Kazakstan Respubliki khalkyn saуқтыrudуң negizi. Іdistemelik оқу құralы. Astana 2014</p> <p>Zheleznyak Yu.D. Theory and methods of sports games. 2014</p> <p>Lyakh, Zdanevich. Physical culture 10-11 class 2012 y.</p>
<b>Language of instruction</b>	Russian, Kazakh
<b>Post requisites</b>	PM 1 – PM 7

**4.3 Specification of the basic module**  
**"Application of the foundations of social sciences for socialization and adaptation in society and the work collective"**

<b>Scope of competence</b>	Basic module
<b>Title and code of the module</b>	Application of the foundations of the social sciences for socialization and adaptation in society and the workforce.
<b>Purpose of the module</b>	After studying this module, the tutor will be able to apply the fundamentals of the social sciences for socialization and adaptation in society and the workforce.
<b>Level of professional qualification</b>	4
<b>Learning outcomes by module</b>	<p>LO 1. To know the basic concepts and information of philosophy, political science, cultural studies and sociology.</p> <p>LO 2. To understand the international political processes, the geopolitical situation and moral values and norms that form tolerance and an active personal position.</p> <p>LO 3. To know basic concepts and information about the main branches of law.</p>
<b>A summary of the content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Understanding the essence and essence of the concepts, categories and information of philosophy, political science, cultural studies and sociology.</li> <li>2. Identification of problems and interrelations of the main categories and concepts of philosophy, political science, cultural studies and sociology</li> <li>3. Analysis of various points of view.</li> <li>4. Characteristics of the structure of the political system, history and the current state of world and traditional religions.</li> <li>5. Definition of differences extremist, radical and terrorist ideologies.</li> <li>6. Tolerant perception of social, ethnic, confessional and cultural differences.</li> <li>7. Possession of the basic provisions of criminal, civil and family law and information about taxes.</li> </ol>

	8. Understanding of responsibility for administrative and corruption offenses and observance of the principles of law and order. 9. Protecting your rights in accordance with labor laws.
<b>Prerequisites</b>	History of Kazakhstan
<b>Disciplines forming the module</b>	Basic philosophy Culturology The basis of the economy. Basis of law Fundamentals of sociology and political science
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intensity (credits RK/ academic hours)</b>	6 credits / 180 hours
<b>Duration of the module</b>	Semester
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process.</b>  <b>Teaching methods.</b>	Lecture, independent work, practical lessons  Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium. project work, case-task
<b>Forms control</b>	Pass fail exam, exam
<b>Required resources</b>	Personal computer, software. Interactive board. Electronic textbook. Sybanbaev K.U. Philosophy. Almaty: Economy 2013 Kishibekov D Philosophy. Almaty: Karasai 2011 Razdykov S.Z. Basics of political science. Textbook. Astana: Folio 2012 Rakhimbaeva A.S. Basics of political science. Course of the lecture. A.Foliant 2012. E-book, Political Science: Summaries, Lectures, author: Mukhaev RT, Zaitsev AV M 2004. Karakuzova Zh.K. Culturology: A: Tome 2014 Kairbekov B.G. National customs and traditions. A: Empire.KZ.2012g. Video: <a href="http://www.ata-mura.kz">http://www.ata-mura.kz</a>
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	

#### 4.4 Specification for basic module 4. “Reading drawings”

<b>Scope of competence</b>	Basic module
<b>Title and code of the module</b>	Reading drawings
<b>Purpose of the module</b>	After studying this module, the tutor will be able to read the drawings.
<b>Level of professional qualification</b>	4
<b>Learning outcomes by module</b>	<ol style="list-style-type: none"> <li>1. To know the rules of design SSDD.</li> <li>2. To issue SSDD in accordance with the main standards of SSPD.</li> <li>3. To perform design on the plane.</li> </ol>
<b>A summary of the content (sections, themes)</b>	<p>Topics from the disciplines</p> <ol style="list-style-type: none"> <li>1. Basic concepts of basic technological drawing.</li> <li>2. Understanding of a unified design documentation system.</li> <li>3. Formulation of the rules of registration.</li> <li>4. Determine the purpose of the scale of the implementation of drawing technical details</li> <li>5. Possession of skills design SSDD.</li> <li>6. Execution of drawings in accordance with the main standards SSPD.</li> <li>7. Reading assembly drawings and circuit diagrams.</li> <li>8. Possession of design skills on the plane.</li> <li>9. Execution of drawings with projection on the plane.</li> </ol>
<b>Prerequisites</b>	
<b>Disciplines forming the module</b>	Technical drawing
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intensity (credits RK/ academic hours)</b>	2 credits/60 hours
<b>Duration of the module</b>	Semester
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process</b>	Lecture, independent work, practical lessons
<b>Teaching methods</b>	

	Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium. project work, case-task
<b>Forms control</b>	Pass fail exam
<b>Required resources</b>	<p>Personal computer, software. Interactive whiteboard. Electronic textbook. Bogolyubov SK "Drawing" Moscow 1989.</p> <p>Saparov V.E. Maksimov N.A. "System of standards in telecommunications and electronics" Moscow 1985.</p> <p>SSDD "Symbols conditional graphically in schemes" Moscow, 1985.</p> <p>State Standards Moscow, 1986 Volume 1,2,3.</p> <p>Baranov B.S. "Fundamentals of drawing" Moscow, 1985. Mironov R.S Mironov B.G. "Collection of tasks for drawing" Moscow, 1984.</p> <p>Egorov S.A. "Drawing and Drawing" Moscow, 1985. Simonenko V.D. "Textbook for drawing 9 cl." Moscow, 2007.</p> <p>Kuprikov M..Y., Markhina L.P. "Line of CMB in drawing" ed. Drofa 2008</p> <p>Yakovlev G.N. "Geometry" Moscow, 1987</p>
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	PM 1- PM 9



**4.5. Specification for Professional Module 5**  
**“Application of basic knowledge of economics in professional activities”**

<b>Scope of competence</b>	
<b>Title and code of the module</b>	Application of basic knowledge of economics in professional activities
<b>Purpose of the module</b>	After studying this module, the tutor will be able to apply the basic knowledge of the economy in professional activities.
<b>Level of professional qualification</b>	4
<b>Learning outcomes by module</b>	<ol style="list-style-type: none"> <li>1. To identify the forms and types of property, types of plans, basic economic indicators of the enterprise.</li> <li>2. To understand the development trends of the world economy, the main objectives of the state's transition to a green economy.</li> <li>3. To identify the possibility of success and risk business.</li> </ol>
<b>A summary of the content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Understanding of the laws and principles of a market economy, tax policy, sources of inflation, the main stages and content of planning.</li> <li>2. Perform the necessary economic calculations using mathematical methods to determine the main economic indicators of the enterprise.</li> <li>3. Determination of the main economic indicators of the enterprise.</li> <li>4. Characteristics of trends in the global economy.</li> <li>5. Understanding the main objectives of the transition of the state to a "green" economy.</li> <li>6. Application of the main methods of calculating gross domestic product and gross national product for the state's transition to a green economy.</li> <li>7. Characteristics of goals, factors, conditions, organizational and legal forms of entrepreneurial activity.</li> <li>8. Understanding the factors that determine the success of business activities.</li> <li>9. Drawing up a business plan</li> </ol>
<b>Prerequisites</b>	Basics of Economics
<b>Disciplines forming the module</b>	Economics of communication enterprises and fundamentals of entrepreneurial activity.

<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intensity (credits / academic hours)</b>	3 credits / 90 hours
<b>Duration of the module</b>	Semester
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process Teaching methods</b>	Lecture, independent work, practical lessons  Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case-study
<b>Forms control</b>	Pass fail exam
<b>Required resources</b>	Personal computer, software. Interactive whiteboard. Electronic textbook. Gabit J.H.H. Microeconomics- Astana, Foliant, 2012. Bekmoldin S.K. Economic Theory-Astana, Foliant, 2012. Chayzhunusova G.ZH. Basics of Economics. Astana, Foliant 2011y. Shulenbaeva S. Workshop on the basics of a market economy, Foliant, 2011. Khamitova G. Economics and fundamentals of entrepreneurship, Foliant, 2011. Bekbolsynova A. Taxes and taxation, Foliant, 2014. Nurpeys E. Basics of Macroeconomics, Foliant, 2011. Khojaniyazov Zh. T. Basics of a Market Economy, Foliant, 2011
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	PM 7 – PM 9

**Specification for Professional Module 6.**  
**“Understanding the history, role and place of Kazakhstan in the world community”**

<b>Scope of competence</b>	
<b>Title and code of the module</b>	Understanding of the history, role and place of Kazakhstan in the world community.
<b>Purpose of the module</b>	After studying this module, the tutor will be able to Understand the history, role and place of Kazakhstan in the world community.
<b>Level of professional qualification</b>	4
<b>Learning outcomes by module</b>	<ol style="list-style-type: none"> <li>1. To name the main historical events.</li> <li>2. To establish causal relationships of historical events.</li> <li>3. To assess the achievements of independent Kazakhstan.</li> </ol>
<b>A summary of the content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Understanding the essence of historical events that took place from antiquity to the present</li> <li>2. Disclosure of the role and place of the Kazakh people in the common Turkic community, in the system of the nomadic civilization, in the development of the historical and cultural community of the peoples of the Eurasian world.</li> <li>3. Compiling a chronology of major historical events</li> <li>4. Understanding the facts, processes and phenomena of historical events</li> <li>5. Determination of the main facts, processes and phenomena that reflect and characterize the integrity and consistency of the history of Kazakhstan</li> <li>6. Establishing causal relationships of historical events</li> <li>7. Understanding the nature and purpose of the political and social changes taking place in the Republic of Kazakhstan after independence.</li> <li>8. Characteristics of the achievements of independent Kazakhstan.</li> <li>9. Evaluation of the achievements of independent Kazakhstan.</li> </ol>

<b>Prerequisites</b>	History of Kazakhstan
<b>Disciplines forming the module</b>	History of Kazakhstan
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intensity (credits RK/ academic hours)</b>	3 credits / 90 hours
<b>Duration of the module</b>	Semester
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process</b> <b>Teaching methods</b>	Lecture, independent work, practical lessons  Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case study
<b>Forms control</b>	Pass fail exam, exam
<b>Required resources</b>	Personal computer, software. Interactive whiteboard. Electronic textbook. Z.O. Artykbaev 12 lectures on the history of Kazakhstan. Folio 2013. Zholdasbayev S. History of Kazakhstan of the Middle Ages. Textbook, 2nd ed., Revised- Almaty: Atamura 2012 Turmanova B.K. Bermanova S.T. History of Kazakhstan. Tutorial. A: Foliant 2013. Kasymbaev Zh.K. History of Kazakhstan (XVIIIv-1914) Textbook. Almaty: Mektep, 2012. Kabuldinov Z.E., Kayipbaeva A.T. History of Kazakhstan (XVIIIv-1914) Textbook for grade 8 of secondary school. 2nd ed., Pererab. Almaty: Atamura, 2012. R. Sausenova. History of Kazakhstan. Almaty: Mektep, 2011. Igibaev S. History of Kazakhstan in sources and materials. Astana: Foliant 2013.
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Culturology, Fundamentals of Sociology and Political Science.

## Specification of basic module 7

### “Application of digital devices and microprocessor systems in communication technology”

<b>Scope of competence</b>	Basic module
<b>Title and code of the module</b>	The use of digital devices and microprocessor systems in communication technology.
<b>Purpose of the module</b>	After studying this module, the tutor will be able to use digital devices and microprocessor systems in communication technology.
<b>Level of professional qualification</b>	4
<b>Learning outcomes by module</b>	<ol style="list-style-type: none"> <li>1. To determine the principle of construction and operation of digital devices and microprocessor systems.</li> <li>2. To distinguish the principle of operation of a typical microprocessor and microcontroller.</li> <li>3. To synthesize combinational and sequential digital.</li> </ol>
<b>A summary of the content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Understanding the basics of universal software packages</li> <li>2. Implementation of computer simulation of digital devices using programs</li> <li>3. The formulation of logical elements and functions in different standards</li> <li>4. The definition of the principle of operation of the structure, the main combinational digital devices</li> <li>5. Possession of technical characteristics, design features and purpose of electrical equipment</li> <li>6. Assembly of semiconductor diodes and other electronics elements, separate blocks of digital devices</li> <li>7. Determination of the possibility of microprocessor tools in solving problems of controlling the operation of station equipment of electronic exchanges of various systems.</li> <li>8. The use of information technology in solving production problems.</li> </ol>

	9. Execution of special computer programs for working with external devices of electronic PBX.
<b>Prerequisites</b>	Basics of Informatics, Physics, Chemistry, Mathematics.
<b>Disciplines forming the module</b>	Computer science. Digital devices and microprocessor systems.
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intensity (credits / academic hours)</b>	2 credits / 60 hours
<b>Duration of the module</b>	semester
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process</b> <b>Teaching methods</b>	Lecture, independent work, practical classes.  Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case-study
<b>Forms control</b>	Pass fail exam
<b>Required resources</b>	Personal computer, software. Interactive whiteboard. Electronic textbook. Computer programs. Goldenberg L.M. and others. Digital devices and microprocessor systems. Tasks and exercises: Proc. manual for universities. L.M. Goldenberg, V.A. Malev, G.B. Malko-M: Radio and Communication, 1992. Kalabekov BA Digital devices and microprocessor systems. M: Hotline-Telecom, 2000. O.N. Lebedev. Memory chips and their application.-M: Radio and communication, 1990. Logic IC KR1533, KR15554: Reference book / Petrovsky I.I., Pribylsky AV, Troyan AA, Chuvelev V.S.- M: TOO " BINOM ", 1993. Opadchiy Yu.F., Gludkin OP, Gurov A.I. Analog and digital electronics.- M: Hot Line-Telecom, 1999. Ugryumov E.P. Digital circuit technology.- SPb: BHV- St. Petersburg, 2000. Usatenko S.T., Kachenyuk TK, Terekhova N.V. Execution of electrical circuits for

	ESKD.-M: Publishing house of standards, 1989. Nsanov MA Digital devices and microprocessor systems. Astana: Foliant, 2010.
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Digital and fiber optic transmission systems, Digital switching systems, Communication networks and switching systems.

**Specification of basic module 8**  
**“Compliance with safety regulations and labor protection”**

<b>Scope of competence</b>	Basic module
<b>Title and code of the module</b>	Compliance with safety regulations and labor protection.
<b>Purpose of the module</b>	After studying this module, the trainee will be able to follow the rules of safety and labor protection.
<b>Level of professional qualification</b>	4
<b>Learning outcomes by module</b>	<ol style="list-style-type: none"> <li>1. To comply with the principle of priority of preserving human health and safety during the labor process.</li> <li>2. To comply with safety regulations, electrical safety and fire safety.</li> <li>3. To apply first aid techniques, methods of protection in emergency situations.</li> </ol>
<b>A summary of the content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Legal regulations in the field of occupational safety and health.</li> <li>2. Ensuring the safety of the workplace.</li> <li>3. Compliance with the requirements of industrial sanitation.</li> <li>4. Assessment of the risk of hazards associated with violations of safety regulations, electrical safety and fire safety.</li> <li>5. Provision of materials, equipment, equipment and fire extinguishing equipment when servicing telecommunications networks.</li> <li>6.. Compliance with safety precautions and precautions when performing maintenance of telecommunications networks.</li> <li>7. Consistent perception, evaluation, comparison and analysis of information and its use for the practical solution of professional tasks</li> <li>8. Demonstration of first-aid techniques, methods of protection in the face of danger to life in emergency situations in their professional activities.</li> <li>9. The use of practical skills to ensure safety in dangerous situations of everyday</li> </ol>



	life and in emergency situations of different nature
<b>Prerequisites</b>	Physics, chemistry .
<b>Disciplines forming the module</b>	Occupational Safety and prevention of accidents. Production training. Professional practice.
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intensity (credits / academic hours)</b>	2 credits /60 hours
<b>Duration of the module</b>	semester
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular/dual
<b>Form of organization of educational process</b> <b>Teaching methods</b>	Lecture, independent work, practical.  Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case-study
<b>Forms control</b>	Test, course work.
<b>Necessary resources</b>	Personal computer, software. Interactive whiteboard. Electronic textbook. Kukin P.P., Lapin V.L., Ponomarev N.L., Serdyuk N.I. Life Safety. Safety of technological processes and production (OT). M: Graduate School 2002. Baklashov N.I., Kitaeva N.ZH., Terekhov B.D. Labor protection at communication enterprises and environmental protection.- M: Radio and communication. 1989 Labor protection in electrical installations. Under. ed. B.A. Knyazevsky. M: 1981 TB rules when working on the wired broadcast stations.
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Technological practice, pre-diploma practice.

**Specification of the professional module 1**  
**“Work organization for assembly, installation and dismantling of the radio-electronic equipment”**

<b>Scope of competence</b>	Organization of work for the Assembly, installation and dismantling of the radio-electronic equipment.
<b>Name and code of the module</b>	Work organization for assembly, installation and dismantling of the radio-electronic equipment.
<b>Purpose of the module</b>	After studying this module the trainee will be able to build, mounting and dismounting devices, units and appliances, radio-electronic equipment.
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To plan diagram of the radio-electronic equipment</li> <li>2. To apply instrumentation for carrying out Assembly, erection and dismantling</li> <li>3. To apply the Radio Assembly devices for holding Assembly, erection and dismantling</li> <li>4. To carry out Assembly, erection and dismantling of devices, appliances and radioelectronic equipment blocks</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Build a diagram of the radio-electronic equipment</li> <li>2. Description of the principle of the work of the scheme</li> <li>3. Listing the destination schema elements</li> <li>4. Monitoring the use of instrumentation and radio assembling and safety devices</li> <li>5. Listing of assignments used instrumentation and radio assembling devices</li> <li>6. The analysis of the characteristics and parameters of schema elements</li> <li>7. The analysis of the design of radioelectronic equipment</li> <li>8. Selection of radio assembling and Instrumentation</li> <li>9. Selection of radio elements of the scheme</li> </ol>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	Materials science, electric radio materials and radio components Life safety

	Technology installation devices, blocks and radioelectronic devices technology Assembly technology devices, blocks and radioelectronic devices technology Manufacturing practice Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits /academic hours)</b>	10 credits / 300 hours
<b>Duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process.</b>	Lecture, independent work, tutorial, lab, practice
<b>Teaching methods.</b>	Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case-study
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	Personal computer, software, radio-assembly equipment: mounting soldering station, dismantling soldering station, Radio Assembly tools, soldering iron, radio-elements, lampstand, oscilloscope, multimeter, fume scrubbers, Tips for soldering etc., Training manuals: G.V. Yarochkin “Radio-electronic equipment and devices”; N.A. Olifirenko, I.V. Ovchinnikova, T.N. Hlystunova – “Assembly, installation, adjustment and repair of electrical equipment”; V.B.Arzamasov, A.N. Volchkov, V.A.Golovin - “Materials science and technology of construction materials; N.I. Kabushkin - “Fundamentals of management”;
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, information technology, records management, modeling, Electrotechnics, electronics Basics

**Specification of the professional module 2**  
**“Work organization on setting up and adjusting devices, blocks and radio-electronic devices technology”**

<b>Scope of competence</b>	Work organization on setting up and adjusting devices, blocks and radio-electronic devices technology
<b>Name and code of the module</b>	Parameter setup and adjustment devices, blocks and radioelectronic devices technology
<b>Purpose of the module</b>	After studying this module the trainee will be able to the configuration and adjustment parameters, devices, appliances and radioelectronic equipment blocks
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To perform various calculations radio electrical and electronic circuits</li> <li>2. To check the features and settings of the radio-electronic devices and appliances</li> <li>3. To tweak and adjustment of customer controls and blocks of radio electronic equipment according to specifications</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Definition of the technical specifications and parameters of schema elements</li> <li>2. Definition of the mathematical formulas for calculating technical parameters and characteristics of circuit elements for a particular type of radio-electronic equipment</li> <li>3. Collection and analysis of calculation results</li> <li>4. Comparison of the results of the validation of the technical characteristics and parameters of settlement data</li> <li>5. Analysis of the causes of the differences calculated data and test results</li> <li>6. Addressing the causes of differences between calculated data and test results</li> <li>7. Listing the assignments and measuring principles</li> <li>8. Accounting technical conditions and instructions on custom and adjustable radio-electronic technique</li> <li>9. Monitoring of settings and adjust the technical parameters and characteristics of circuit elements according to calculations</li> </ol>

<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	Methods of operation of the control and measuring equipment and technological equipment Assembly and installation Techniques for tuning and adjusting devices and radioelectronic equipment blocks Manufacturing practice Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits /academic hours)</b>	10 credits / 300 hours
<b>Duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process Teaching methods</b>	Lecture, independent work, tutorial, lab, practice Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case-task
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	Personal computer, software, radio-assembly equipment: mounting soldering station, dismantling soldering station, Radio Assembly tools, soldering iron, radio-elements, lampstand, oscilloscope, multimeter, fume scrubbers, Tips for soldering etc., Training manuals: G.V. Yarochkin “Radio-electronic equipment and devices”; N.A. Olifirenko, I.V. Ovchinnikova, T.N. Hlystunova – “Assembly, installation, adjustment and repair of electrical equipment”; N.I. Kabushkin - “Fundamentals of management”;
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, information technology, records management, modeling, Electrotechnics, electronics Basics

**Specification of the professional module 3**  
**"Organization of work on the repair of electronic equipment."**

<b>Scope of competence</b>	Organization of work on the diagnosis and repair of electronic equipment.
<b>Name and code of the module</b>	Organization of work on the repair of electronic equipment.
<b>Purpose of the module</b>	After studying this module, the student will be able to organize work on the repair of electronic equipment
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To identify inoperable circuit elements</li> <li>2. To carry out repair work</li> <li>3. To keep records of repaired electronic equipment</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Enumeration of the principles of work of elements of the scheme</li> <li>2. Enumeration of parameters of circuit elements</li> <li>3. Measurements of parameters of circuit elements</li> <li>4. Comparison of the parameters of the elements of the list with the measurement results</li> <li>5. Disposal of old circuit elements</li> <li>6. Purchase of new circuit elements</li> <li>7. Inspection of repair of unworkable circuit elements</li> <li>8. Accounting for replaced circuit elements</li> <li>9. Consideration of settings for inoperative circuit elements.</li> <li>10. Accounting for repaired circuit elements</li> </ol>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	Materials, electrical and radio components Life safety Technology of installation of devices, units and devices of electronic equipment Internship Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits RK/academic hours)</b>	16 credits / 480 hours

<b>Duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process. Teaching methods</b>	Lecture, independent work, tutorial, lab, practice Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case-study
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	Personal computer, software, radio installation equipment: assembly soldering station, dismantling soldering station, radio installation tools, lamp, soldering iron, radio elements, oscilloscope, multimeter, smoke traps, tips for a soldering iron, etc. Teaching and learning aids: Izyumov N. M. Linde D. P. - "Fundamentals of Radio Engineering", Zyryanov Yu. T., Belousov O. A., Fedyunin P. A. - "Fundamentals of Radio Engineering Systems", Kabushkin N. I. - "Fundamentals of Management"; V. V. Petrov - "Adjustment, diagnostics and monitoring of the operability of assembled nodes, blocks and devices of radioelectronic equipment, equipment of wire communication, elements of nodes of impulse and computer equipment"; Davidson, G.L. - "Troubleshooting and repair of electronic equipment"
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, information technology, records management, modeling, Electrotechnics, Basics of electronics

**Specification of the professional module 4**  
**“Organization of work on diagnosis of electronic equipment”**

<b>Scope of competence</b>	Organization of work on the diagnosis and repair of electronic equipment.
<b>Name and code of the module</b>	Organization of work on the diagnosis and repair of electronic equipment.
<b>Purpose of the module</b>	After studying this module, the student will be able to organize work on the diagnosis of electronic equipment.
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To control the parameters of electronic equipment in the process of operation</li> <li>2. To use software when conducting diagnostics of electronic equipment</li> <li>3. To create diagnostic algorithms for electronic equipment</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Analysis of parameters of electronic equipment in the process of operation</li> <li>2. Verification of the results of measurements of parameters of radio-electronic equipment in the process of operation with a list of technical parameters of radio-electronic equipment</li> <li>3. Control of setting parameters of electronic equipment in accordance with the list of technical parameters</li> <li>4. Enumeration of software for diagnostics of radio-electronic equipment</li> <li>5. Possession of a personal computer</li> <li>6. Analysis of the state of the equipment and evaluation of its performance</li> <li>7. Planning the procedure for the diagnosis of electronic equipment</li> <li>8. Display diagnostic results</li> <li>9. Analysis of diagnostic results</li> </ol>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	<p>Theoretical bases of diagnostics of detection of failures and defects of various types of electronic equipment</p> <p>The theoretical basis for the repair of various types of electronic equipment</p> <p>Internship</p>



	Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits RK/academic hours)</b>	8 credits / 240 hours
<b>Duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process. Teaching methods.</b>	Lecture, independent work, tutorial, lab, practice Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case-study
<b>Control Forms</b>	Coursework, exam, practical work
<b>Required Resources</b>	Personal computer, software, radio installation equipment: assembly soldering station, dismantling soldering station, radio installation tools, lamp, soldering iron, radio elements, oscilloscope, multimeter, smoke traps, tips for a soldering iron, etc. Teaching and learning aids: Izyumov N. M. Linde D. P. - "Fundamentals of Radio Engineering", Zyryanov Yu. T., Belousov O. A., Fedyunin P. A. - "Fundamentals of Radio Engineering Systems", Kabushkin N. I. - "Fundamentals of Management"; V. V. Petrov - "Adjustment, diagnostics and monitoring of the operability of assembled nodes, blocks and devices of radioelectronic equipment, equipment of wire communication, elements of nodes of impulse and computer equipment"
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, information technology, records management, modeling, Electrotechnics, Basics of electronics

**Specification of the professional module 5**  
**“Planning of standard testing devices, blocks and appliances, radio-electronic equipment”**

<b>Scope of competence</b>	Planning of standard testing devices, blocks and appliances, radio-electronic equipment
<b>Name and code of the module</b>	Tests of the radio-electronic equipment
<b>Purpose of the module</b>	After studying this module the trainee will be able to carry out tests of the radio-electronic equipment
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To determine the procedures for testing the radio-electronic equipment</li> <li>2. To analyze the reasons for the refusal of the radio-electronic equipment during testing</li> <li>3. To make conclusions based on the results of the tests</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Organisation of events for testing the radio-electronic equipment to conduct defined technical documentation</li> <li>2. Analysis of certain characteristics of the radio-electronic equipment</li> <li>3. Organization of the tests on the nature of external influences</li> <li>4. Health monitoring each schema element</li> <li>5. Check the settings and adjust the radio device</li> <li>6. Analysis of the causes of failure of the radio-electronic equipment</li> <li>7. Enumeration of requirements for parameters of the radio-electronic equipment</li> <li>8. Definition of working conditions of the radio-electronic equipment</li> <li>9. Evaluation of the efficiency of the radio-electronic equipment</li> </ol>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	<p>Methods of testing the radio-electronic equipment</p> <p>Fundamentals of radio engineering</p> <p>Methods and means of verification of electrical measuring instruments</p> <p>Methods and technology of radioelectronic equipment testing</p>

	Manufacturing practice Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits /academic hours)</b>	7 credits / 210 hours
<b>The duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>The form of organization of educational process</b> <b>Teaching methods</b>	Lecture, independent work, tutorial, lab, practice  Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case study
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	Personal computer, software, radio installation equipment: assembly soldering station, dismantling soldering station, radio installation tools, lamp, soldering iron, radio elements, oscilloscope, multimeter, smoke traps, tips for a soldering iron, etc. Teaching and learning aids: Izyumov N. M. Linde D. P. - “Fundamentals of Radio Engineering”, Zyryanov Yu. T., Belousov O. A., Fedyunin P. A. - “Fundamentals of Radio Engineering Systems”, Kabushkin N. I. - "Fundamentals of Management"; Malinsky V.D. - “Testing of radio equipment”
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, information technology, records management, modeling, Electrotechnics, Basics of Electronics

**Specification of the professional module 6**  
**"Organization of work on verifying the status of equipment received from the repair"**

<b>Scope of competence</b>	Organization of work on the control of technical condition equipment received from repair
<b>Name and code of the module</b>	Organization of work on checking the status of equipment received from repair
<b>Purpose of the module</b>	After studying this module, the student will be able to organize work on checking the status of equipment received from the repair
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To check the condition of the equipment received from the repair</li> <li>2. To keep records and analysis of indicators of the use of electronic equipment</li> <li>3. To assess the technical condition of electronic equipment</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Testing the performance of electronic equipment</li> <li>2. Analysis of parameters of circuit elements</li> <li>3. Verification of results with the data from the technical documentation of electronic equipment</li> <li>4. Verification of compliance with the rules of technical operation and maintenance of electronic equipment</li> <li>5. Identification of installation or disassembly of radio electronic equipment circuits</li> <li>6. Identification of replacement elements of the circuit of electronic equipment</li> <li>7. Determination of the level of wear of electronic equipment</li> <li>8. Predicts the future life of electronic equipment.</li> <li>9. Explains the assessment of the technical condition of electronic equipment</li> </ol>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	Basics of circuitry in telecommunications Telecommunications Theory The theory of electrical circuits in telecommunications Technical means of monitoring electronic work

	equipment, prospects and directions for their improvement Internship Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits RK/academic hours)</b>	6 credits/180 hours
<b>The duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process. Teaching methods.</b>	Independent work, lecture, tutorial, lab, practice  Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case study
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	Personal computer, software, radio installation equipment: assembly soldering station, dismantling soldering station, radio installation tools, lamp, soldering iron, radio elements, oscilloscope, multimeter, smoke traps, tips for a soldering iron, etc. Teaching and learning aids: Izyumov N. M. Linde D. P. - "Fundamentals of Radio Engineering", Zyryanov Yu. T., Belousov O. A., Fedyunin P. A. - "Fundamentals of Radio Engineering Systems", Kabushkin N. I. - "Fundamentals of Management"; V. V. Petrov - "Adjustment, diagnostics and monitoring of the operability of assembled nodes, blocks and devices of radioelectronic equipment, equipment of wire communication, elements of nodes of impulse and computer equipment"; Davidson, G.L. - "Troubleshooting and repair of electronic equipment"
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, Information technology, Records management, Modeling, Electrotechnics, Electronics Basics

**Specification of the professional module 7**  
**"Monitoring the causes and nature of the occurrence of defects"**

<b>Scope of competence</b>	Analysis of the causes and nature of defects
<b>Name and code of the module</b>	Analysis of the causes and nature of defects
<b>The purpose of the module</b>	After studying this module, the student will be able to analyze the causes and nature of the occurrence of defects.
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To determine the nature of the occurrence of different types of defects.</li> <li>2. To analyze the causes of the occurrence of various types of defects.</li> <li>3. To work with project, design and technical documentation</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Determination of the nature of occurrence of structural types of defects</li> <li>2. Determination of the nature of the occurrence of manufacturing types of defects</li> <li>3. Determination of the nature of occurrence of operational types of defects</li> <li>4. Analysis of the causes of the occurrence of structural types of defects</li> <li>5. Analysis of the causes of industrial types of defects</li> <li>6. Analysis of the causes of operational types of defects</li> <li>7. Analysis of the design documentation of electronic equipment</li> <li>8. Analysis of the technical documentation of electronic equipment</li> <li>9. Analysis of the design documentation of electronic equipment</li> </ol>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	<p>Basics of circuitry in telecommunications  Telecommunications Theory  The theory of electrical circuits in telecommunications  Technical means of monitoring electronic work  equipment, prospects and directions for their improvement</p>

	Internship Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits /academic hours)</b>	7 credits / 210 hours
<b>The duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular/dual
<b>The form of organization of educational process Teaching methods</b>	Lecture, independent work, tutorial, lab, practice Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case study
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	Personal computer, software, radio installation equipment: assembly soldering station, dismantling soldering station, radio installation tools, lamp, soldering iron, radio elements, oscilloscope, multimeter, smoke traps, tips for a soldering iron, etc. Teaching and learning aids: Izyumov N. M. Linde D. P. - "Fundamentals of Radio Engineering", Zyryanov Yu. T., Belousov O. A., Fedyunin P. A. - "Fundamentals of Radio Engineering Systems", Kabushkin N. I. - "Fundamentals of Management"; V. V. Petrov - "Adjustment, diagnostics and monitoring of the operability of assembled nodes, blocks and devices of radioelectronic equipment, equipment of wire communication, elements of nodes of impulse and computer equipment"; Davidson, G.L. - "Troubleshooting and repair of electronic equipment"
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, Information technology, Records management, Modeling, Electrotechnics, Basics of electronics

## Specification of the professional module 8

### “Development and design of engineering and technical documentation and other normative-technical documents in accordance with the requirements of standards, GOST, SSDD and other normative-technical documents”

<b>Scope of competence</b>	Development design and technical documentation of the radio-electronic equipment
<b>Name and code of the module</b>	Development and design of engineering and technical documentation and other normative-technical documents in accordance with the requirements of standards, GOST, SSDD and other normative-technical documents
<b>The purpose of the module</b>	After studying this module the trainee will be able to develop and execute design and technical documentation and other normative-technical documents in accordance with the requirements of GOST standards, SSDD and other normative-technical documents
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To develop instructions for use of the radio-electronic equipment</li> <li>2. To develop a list of technical parameters of the radio-electronic equipment</li> <li>3. To register the technical documentation of the radio-electronic equipment</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Analysis of the rules for the operation of the radio-electronic equipment</li> <li>2. Identification of prohibited acts applicable to radio-technology</li> <li>3. Ensuring the safe operation of the radio-electronic equipment</li> <li>4. Enumeration of technical parameters of the radio-electronic equipment</li> <li>5. Confirmation in the correctness of technical parameters</li> <li>6. Determination of the maximum and minimum settings of the radio-electronic equipment to ensure its operability</li> <li>7. Enumeration of the rules for the operation of the radio-electronic equipment in accordance with the requirements of the standards</li> </ol>



	<p>8. Enumeration of technical parameters of the radio-electronic equipment in accordance with the requirements of the standards</p> <p>9. Enumeration of requirements standards within GOST, SSDD and other normative-technical documents</p>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics
<b>Modules forming the discipline</b>	<p>Basics of circuitry in telecommunications</p> <p>Telecommunications Theory</p> <p>The theory of electrical circuits in telecommunications</p> <p>Technical means of monitoring electronic work equipment, prospects and directions for their improvement</p> <p>Internship</p> <p>Management</p>
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits /academic hours)</b>	10 credits/330 hours
<b>Duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular
<b>Form of organization of educational process. Teaching methods.</b>	<p>Lecture, independent work, tutorial, lab, practice</p> <p>Oral interaction, testing, presentation, report, post, interviews, essays, creative task, Colloquium. project work, case-task</p>
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	<p>Personal computer, software. Educational tools: SSDD, GOST, SSPD, B. Yasinsky – “Development of technological documentation”; N.I. Kabushkin – “Fundamentals of management”;</p>
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, information technology, records management, modeling, Electrotechnics, Electronics Basics

**Specification of the professional module 9**  
**“Development of prospective technical requirements to the design of radioelectronic equipment”**

<b>Scope of competence</b>	Development methods of reception, transmission and processing of signals, ensuring the growth of technical characteristics of radio-electronic equipment
<b>Name and code of the module</b>	Development of prospective technical requirements to the design of radioelectronic equipment
<b>Purpose of the module</b>	After studying this module the trainee will be able to develop prospective technical requirements to the design of radioelectronic equipment
<b>Level of professional qualification</b>	5
<b>Learning Outcomes by Module</b>	<ol style="list-style-type: none"> <li>1. To monitor the market new solutions in the field of development of radio-electronic equipment</li> <li>2. To perform calculations on the project in accordance with the technical assignment</li> <li>3. To develop prospective technical requirements to the design of radioelectronic equipment</li> </ol>
<b>Summary of Content (sections, themes)</b>	<ol style="list-style-type: none"> <li>1. Identifying sources of information for the monitoring of the market of the radio-electronic equipment</li> <li>2. Allocation of the necessary information</li> <li>3. Systematization of information received</li> <li>4. Definition of the technical specifications</li> <li>5. Technical calculations to improve the technical characteristics of radio-electronic equipment</li> <li>6. Experiments using calculations performed</li> <li>7. Identification of alternative requirements to design radio- equipment</li> <li>8. Generating ideas to improve technical characteristics of radio-electronic equipment</li> <li>9. Dichotomy of the developed prospective technical requirements with previous</li> </ol>
<b>Prerequisites</b>	Physics, Mathematics, Geometry, Informatics

<b>Modules forming the discipline</b>	Fundamentals of engineering in telecommunications Theory of telecommunications Theory of electrical circuits in telecommunications Technical pest control work radio equipment, perspectives and directions of their improvement Manufacturing practice Management
<b>Module type (mandatory, optional)</b>	Mandatory
<b>Labor intense (credits /academic hours)</b>	10 credits / 300 hours
<b>Duration of the module</b>	
<b>Form of teaching</b>	Full-time
<b>Education technology</b>	Modular/dual
<b>Form of organization of educational process Teaching methods</b>	Lecture, independent work, tutorial, lab, practice Oral interaction, testing, presentation, report, post, interviews, essays, creative task, colloquium, project work, case study
<b>Control Forms</b>	Pass fail exam, exam
<b>Required Resources</b>	Personal computer, software, radio-assembly equipment: mounting soldering station, dismantling soldering station, Radio Assembly tools, soldering iron, radio-elements, lampstand, oscilloscope, multimeter, fume scrubbers, Tips for soldering etc., Training manuals: N.M. Izyumov. D.P. Linde – “Fundamentals of radio engineering”, Yu.T.Zyryanov, O.A.Belousov, F.P.Fedunin – “Basics of radio-technical systems, N.I. Kabushkin – “Fundamentals of management”; N.K.Milenin - “Electronics and circuitry”; K.K. Vassilyev – “Telecommunications Theory”
<b>Language of instruction</b>	Russian, Kazakh
<b>Post-requisites</b>	Fundamentals of management, Information technology, Records management, Modeling, Electrotechnics, Basics of Electronics

## PLAN OF EDUCATIONAL PROCESS

**Code and the education profile:** 1300000 – Communications, telecommunications and information technology

**Specialty:** 1306000 – Electronics and communications (by type)

**Qualification:** 1306134 - “Applied Bachelor of radio technician”

**Form of study: Full-time**  
**Standard term of training: 2 years**  
**10 months on the basis of general secondary education**

Index	Modules and types of training activities	Number of credits	Form control		The amount of training time (hours)						Distribution courses	
			Exam	Differential testing	Total hours	From them:						
						On the types of training			On the forms of organization training			
						Theoretical training	Laboratory and practical works, course projects and	Practical training *	Audit, contact	SRO		
PSAS	FEWS											

<b>B M</b>	<b>Basic modules</b>	<b>30</b>	<b>3</b>	<b>8</b>	<b>900</b>	<b>630</b>	<b>270</b>		<b>720</b>	<b>180</b>	<b>60</b>	<b>1-6</b>
BM 1	Application of professional vocabulary, the preparation of business papers in the field of professional activity	6	+	+	180	120	60		120	60	15	1-6
BM 2	Development and improvement of physical qualities	6	+	+	180	30	150		180			1-6
BM 3	Application of the foundations of social sciences for socialization and adaptation in society and the workforce	6		+	180	180			150	30	-	1-6
BM 4	Reading of drawings	2		+	60	30	30		30	30	15	1-6
BM 5	Application of basic knowledge of economics in professional activities	3		+	90	60			60	30	15	1-6
BM 6	Understanding the history, role and place of Kazakhstan in the world community	3		+	90	90	-		90	-	-	1-6
BM 7	Application of digital devices and microprocessor systems in communication technology	2	+	+	60	30	30		30	30	15	1-6
BM 8	Compliance with safety regulations and labor protection	2		+	60	60	-		60			1-6
<b>PM</b>	<b>Professional modules on working qualifications</b>	<b>36</b>	<b>+</b>	<b>+</b>	<b>1080</b>	<b>600</b>	<b>240</b>	<b>240</b>	<b>600</b>	<b>480</b>	<b>120</b>	<b>1-6</b>

PM 1	Work organization for assembly, installation and dismantling of the radio-electronic equipment.	10	+	+	300	180	60	60	180	120	60	1-6
PM 2	Work organization on setting up and adjusting devices, blocks and radio-electronic devices technology	10	+	+	300	180	60	60	180	120	60	1-6
PM 3	Organization of work on the repair of electronic equipment.	16	+	+	480	240	120	120	240	240	-	1-6
<b>PM</b>	<b>Professional Modules of Midlevel Specialist</b>	<b>21</b>	+	+	<b>630</b>	<b>300</b>	<b>240</b>	<b>90</b>	<b>300</b>	<b>330</b>	<b>180</b>	<b>1-6</b>
PM 4	Organization of work on the diagnosis of electronic equipment.	8	+	+	240	120	90	30	120	120	90	1-6
PM 5	Planning standard testing of devices, units and devices of electronic equipment	7	+	+	210	90	90	30	90	120	60	1-6
PM 6	Organization of work on checking the status of equipment received from repair	6	+	+	180	90	60	30	90	90	30	1-6
<b>PM</b>	<b>Professional modules of applied bachelor qualifications</b>	<b>27</b>	+	+	<b>810</b>	<b>240</b>	<b>390</b>	<b>180</b>	<b>240</b>	<b>570</b>	<b>390</b>	
PM 7	Monitoring of the causes and nature of defects	7	+	+	210	90	60	60	90	120	60	1-6
PM 8	Development and execution of design and technical documentation and other regulatory and technical documents in accordance with the requirements of standards, GOST, SSDD and other regulatory and technical documents	10	+	+	300	90	150	60	90	210	150	1-6

PM 9	Development of prospective technical requirements to the design of radio-electronic equipment	10	+	+	300	60	180	60	60	240	180	1-6
	<b>Subtotal:</b>	<b>114</b>			<b>3420</b>	<b>1770</b>	<b>1140</b>	<b>510</b>	<b>1860</b>	<b>1560</b>	<b>750</b>	
PP	Professional practice (academic, industrial, undergraduate)	42			1260			1260	180	1080	300	1-6
DD	Diploma project *	9			270		270		60	210	30	6
IC	Intermediate certification	10			300	300			300			1-6
FC	Final certification	2			60	60			60			6
	<b>Total compulsory education:</b>	<b>180</b> <b>(144</b> <b>+36)</b>			<b>5400</b> <b>(4320</b> <b>+1080)</b>	<b>2130</b>	<b>1410</b>	<b>1770</b>	<b>2460</b>	<b>2850</b>	<b>1080</b>	
C	Consultation	10			300	300				300		1-6
O	Optional classes	11			330	330				330		1-6
	<b>Total:</b>	<b>201</b> <b>(165</b> <b>+36)</b>			<b>6030</b> <b>(4950</b> <b>+1080)</b>	<b>2760</b>	<b>1410</b>	<b>1770</b>	<b>2460</b>	<b>3480</b>	<b>1080</b>	

**Note:**

\* The forms of control (the number of course papers, examinations), the order of studying the disciplines (distribution by semester) are exemplary and can vary depending on the forms of study, the specifics of specialties, local and other conditions (circumstances), including, in accordance with the needs of employers.

\*\* In accordance with the State compulsory education standard the Technical and Vocational Education, educational institutions can change up to 50% of the amount of study time allocated for the development of educational material for modules, up to 50% for each module and up to 60% (up to 80% for dual training) of vocational training and professional practice with keeping the total number of hours for compulsory education.