

**DEPARTMENT OF EDUCATION AND SCIENCE OF UKRAINE**

**NATIONAL TECHNICAL UNIVERSITY  
«KHARKIV POLYTECHNIC INSTITUTE»**

**ASSERT**

Chancellor NTU «KhPI»

\_\_\_\_\_ E.I.Sokol  
«\_\_»\_\_\_\_\_ 2019 y.

**EDUCATIONALLY-PROFESSIONAL PROGRAM**

**«RAILWAY TRANSPORT»**

**First level of higher education**

**speciality 273 «the Railway transport»**

**area of knowledge 27 «Transport»**

**Qualification: Bachelor of a railway transport**

**RATIFIED**

**BY SCIENTIFIC ADVICE OF NTU «KhPI»**

Chairman of scientific advice

\_\_\_\_\_/L.L. Tovazhnianskyi/

protocol № from

«\_\_»\_\_\_\_\_ 2019 y.

**Kharkiv 2019**

**SHEET OF CONCORDANCE**  
educationally-professional program

Level of higher education	First (bachelor)
Area of knowledge	<b>27 «Transport»</b>
Speciality	<b>273 «Railway transport»</b>
Specializations	273-01 «Locomotives and locomotive establishment» 273-02 «The logistic is on a railway transport»
Qualification	<b>A bachelor of a railway transport</b>

**APPROVED**

By a Scientifically-methodical commission  
on speciality the «Railway transport»  
Presiding commissioner

\_\_\_\_\_ B. H. Liubarskyi

« \_\_\_\_ » \_\_\_\_\_ 2018

**RECOMMENDED**

By methodical advice of NTU «KhPI»  
Vice-chairman of methodical advice

\_\_\_\_\_ P. Mihushchenko

« \_\_\_\_ » \_\_\_\_\_ 2018

**RATIFIED AND GIVEN TO ACTION**

By the order of chancellor of the National technical university the «Kharkiv polytechnic institute» from « \_\_\_\_ » \_\_\_\_\_ 20\_\_ № \_\_\_\_.

This educationally-professional program can not be fully or partly recreated, circulated and widespread without permission of the National technical university the «Kharkiv polytechnic institute».

## PREFACE

Educational program «Transport» the first level of higher education after speciality 273 the «Railway transport» area of knowledge a 27 «Transport» worked out on the basis of standard of higher education after speciality 273 the «Railway transport» of area of knowledge a 27 «Transport» for the first (bachelor) level of higher education, Department of education and science of Ukraine №ratified by Order 1067 from 04.10.2018p.

The «Kharkiv polytechnic institute» is worked out by the project group of department of electric transport and тепловогозобудування of Educational-scientific institute of energy, electronics and electromechanics of the National technical university in composition:

1. **Liubarskyi Boris Grigorievich**, doctor of engineering sciences, professor, manager of department of electric transport and тепловогозобудування of Educational-scientific institute of energy, electronics and electromechanics of the National technical university the «Kharkiv polytechnic institute»(guarantor of the educational program).

2. **Masliiev Viacheslav Heorhijovych**, doctor of engineering sciences, professor, professor of department of electric transport and тепловогозобудування of Educational-scientific institute of energy, electronics and electromechanics of the National technical university the «Kharkiv polytechnic institute».

3. **Buriakovskiy Serhij Hennadijovych**, doctor of engineering sciences, professor, director NDPKI «Molniya» the National technical university the «Kharkiv polytechnic institute».

4. **Tyshchenko Anna Anatoliivna**, candidate of engineering sciences, associate professor of department of electric the stations of Educational-scientific institute of energy, electronics and electromechanics of the National technical university the «Kharkiv polytechnic institute».

5. **Iakunin Dmytro Ihorovych**, candidate of engineering sciences, associate professor, associate professor of department of electric transport and тепловогозобудування of Educational-scientific institute of energy, electronics and electromechanics of the National technical university the «Kharkiv polytechnic institute».

### Reviewers:

1. A doctor of engineering sciences, professor M. M. Babaiev, Ukrainian state university of railway transport, manager of department, is «Electroenergy, electrical engineering and electromechanics».
2. A doctor of engineering sciences, professor D. O. Volontsevych, National technical university, is the «Kharkiv polytechnic institute», manager of department «Information technologies and systems of the wheeled and caterpillar machines name of O.O. Morozov»

### Reviews-reviews of external stakeholders:

1. A research department is «Infrastructure of railways and electric traction» of the Kharkiv separation of branch the « Design and survey institute of railway transport».
2. «Service of locomotive economy» of the Public joint-stock company is the »Ukrainian railway».
3. DP is «Plant » ELEKTROVAZhMASH».

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## Educational program profile from speciality № 273 the «Railway transport»

<b>1 – General information</b>	
Complete name of higher educational establishment and structural subdivision	A national technical university is the «Kharkiv polytechnic institute» Educational-scientific institute of energy, electronics and electromechanics Department of electric transport and locomotive construction
Degree of higher education and name of qualification of original a language	A degree of higher education - is a bachelor Educational qualification is a bachelor from a railway transport Qualification in a diploma - engineer of railway transport
Official name of the educational program	The Educationally-professional program of the first (bachelor) level of higher education is the «Railway transport»
Type of diploma and volume of the educational program	Diploma of bachelor, single, 240 credits of ECTS, 3 and 10 months
Presence of accreditation	-Certificate about accreditation: series of HД № 2192187 from September, 06 in 2017 - Term of action : to 01 July 2025p.
A cycle/is a level	FQ - EHEA is the first cycle, QF LLL is a 6 level, HPK is a 1 level
Pre-conditions	Complete secondary education
Teaching language(s)	Ukrainian
Term of action of the educational program	In accordance with the term of action of certificate about accreditation
Internet-address of the permanent placing of description of the educational program	<a href="http://www.kpi.kharkov.ua/rus/faculty/e">http://www.kpi.kharkov.ua/rus/faculty/e</a>
<b>2 – Aim of the educational program</b>	
<p>Combination of high level of professional preparation after speciality the «Railway transport» in industry of transport with forming for the specialists of scientific and technical world view and grant of broad mind in social, humanitarian, fundamental (naturally-scientific) and professional areas.</p> <p>An achievement of the marked aim is base on principles of the following and individualization of studies, solidity and integrity of grant of knowledge, practical orientation and realization of place of got competentions, symbiosis of scientific and system approaches, and others like that.</p>	

<b>3 - Description of the educational program</b>	
<b>Subject domain (area of knowledge, speciality, specialization (at presence of))</b>	Area of knowledge : a 27 «Transport» Speciality: 273 the «Railway transport» Specializations: A block is 1 «Locomotives and locomotive establishment» A block is 2 «Logistic on a railway transport»
<b>Orientation of the educational program</b>	The Educationally-professional program is oriented to forming of maximally wide scientific and technical world view of future specialist after specializations: locomotives and locomotive economy and logistic on a railway transport. The program is balanced in relation to socialhumanitarian, fundamental and professional component preparation and contains the sufficient selective component of preparation after specializations.
<b>Basic focus of the educational program and specialization</b>	Universal, special education and professional preparation in industry of transport from speciality the «Railway transport» with an acquisition of necessary practical skills option for further studies or professional career. <b>Keywords:</b> railway; theory of traction of trains; hauling transmissions of power; technology of production and repair of rolling stock, logistic on a railway transport.
<b>Program features</b>	The Educationally-professional program of preparation of bachelor is worked out for the bread-winners of higher education, that aim to become specialists in the spheres of a transport engineering and scientific activity of railway transport. The program is balanced in relation to socialhumanitarian, fundamental and professional component preparation. A key aspect of the program is a wide selective component of preparation after the blocks of specializations. It gives an opportunity to get base knowledge from socialhumanitarian, fundamental and naturally-scientific disciplines, disciplines of pan-professional preparation and special professional preparation in industry of transport.
<b>4 – Fitness of graduating students before employment and further studies</b>	
<b>A fitness is to employment</b>	Graduating students with success can work on enterprises and companies at industries of a transport railway infrastructure, and also in branch scientific, project and project-designer organizations and establishments. Professional possibilities of graduating students (in accordance with Classifier of professions ДК 003:2010). The basic sphere of employment answers codes of KII a from 2143.1 to 2144.1 operating release of the National classifier of Ukraine.
<b>Further studies</b>	A renewal of education option is at next (to the master's degree) level of higher education (7 level of HPK, second cycle of FQ - EHEA and 7 level of EQF - LLL) after the corresponding educationally-professional or educationally-scientific programs. Possibility of after diploma education is for the receipt of professional qualification on corresponding professional standards.
<b>5 – Teaching and evaluation</b>	
<b>Teaching and studies</b>	Lectures, laboratory and practical employments, scientific - practical seminars, implementations of educational and real projects (studies are on projects), problem-oriented studies and studies after queries, student-centred studies, dual studies, controlled from distance and mixed studies, independent work and self-training, practice,

	preparation of qualifying work.
<b>Evaluation</b>	<p>Current and final control of knowledge (questioning, control and individual tasks, testing and others like that), tests and examinations (verbal and writing), defence of educational projects with presentation, public defence of qualifying work.</p> <p>Rating system of evaluation, verbal and writing exams, testing.</p> <p>The evaluation system envisages application of the international system ECTS (with estimations And, B, C, D, E, F), national system (with estimations «perfectly», «well», «satisfactorily» and «unsatisfactorily»), and also 100-ball system INSTITUTION of higher learning with the set system of accordance.</p>

<b>6 – Programmatic to the competence</b>	
<b>Integral competence</b>	Ability to decide the intricate specialized problems and practical problems in professional activity in the field of railway transport in accordance with specialization or in the process of further studies with application of positions, theories and methods of natural, technical, informative and socio-economic sciences, that is characterized by a complexity and vagueness of operating of objects of railway transport conditions.
<b>General to the competence (ZK)</b>	<p><b>ZK 1.</b> Ability to apply knowledge in practical situations.</p> <p><b>ZK 2.</b> Knowledge and understanding of subject domain and understanding of professional activity.</p> <p><b>ZK 3.</b> Ability to communicate an official language both orally, and in writing.</p> <p><b>ZK 4.</b> Ability to communicate a foreign language.</p> <p><b>ZK 5.</b> Skills of the use of information and of communication technologies.</p> <p><b>ZK 6.</b> Ability to study and seize modern knowledge.</p> <p><b>ZK 7.</b> A capacity is for a search, treatment and analysis of information from different sources.</p> <p><b>ZK 8.</b> Skills of interpersonality co-operation.</p> <p><b>ZK 9.</b> Ability to work in a command.</p> <p><b>ZK 10.</b> Skills of realization of safe activity.</p> <p><b>ZK 11.</b> Ability to estimate and provide quality of producible works.</p> <p><b>ZK 12.</b> Definiteness and persistence are in relation to the put tasks and taken duties.</p> <p><b>ZK 13.</b> Ability to realize right and duties as a member of society, to realize the values of civil (free democratic) society and necessity of him steady development, supremacies of right, rights and freedoms of man and citizen in Ukraine.</p> <p><b>ZK 14.</b> Ability to keep and increase moral, cultural, scientific values and achievements of society on the basis of understanding of history and conformities to law of development of subject domain, her place in the general system of knowledge about nature and society and in development of society, technique and technologies, to use different kinds and forms of motive activity for active rest and conduct of healthy way of life.</p>

<p><b>To the profession of competence of speciality (FK)</b></p>	<p><b>FK 1.</b> Inhibition is in professional activity of requirements of normatively-legal, legislative acts of Ukraine, Rules of technical exploitation of railways of Ukraine, instructions and recommendations from exploitation, repair and maintenance of objects of railway transport and their systems.</p> <p><b>FK 2.</b> Ability to distinguish the objects of railway transport and their constituents, determine requirements to their construction, parameters and descriptions.</p> <p><b>FK 3.</b> Ability of realization of measurable experiment is from determination of parameters and descriptions of objects of railway transport, their aggregates, systems and elements.</p> <p><b>FK 4.</b> Ability to develop and inculcate technological processes, technological equipment and technological rigging, facilities of automation and mechanization at a production, exploitation, repair and maintenance of objects of railway transport, their systems and elements.</p> <p><b>FK 5.</b> Ability to develop, to design and apply in industry documentation in relation to the technological processes of building, exploitation, repair and maintenance of objects of railway transport, their systems and other instructional pointing, rules and methodologies.</p> <p><b>FK 6.</b> Ability to develop the use taking into account safe terms, міцнісних, aesthetic and economic parameters requirement specifications and technical requirements on planning of objects of railway transport, his systems and separate elements; to fold the plans of placing of equipment, technical rigging and organization of workplaces; to expect loading of equipment and indexes of quality of products.</p> <p><b>FK 7.</b> Ability to analyse the technological processes of production and repair of objects of railway transport as a management object, to apply expert estimations for making of administrative decisions in relation to the further functioning of enterprise with the estimation of quality of his products.</p> <p><b>FK 8.</b> Ability to organize exploitation of objects of railway transport, their systems and elements, with the ground of structure of management, technical service and repair, exploitation.</p> <p><b>FK 9.</b> Ability to organize productive activity of structural subdivisions of linear enterprises and plants, small collectives of performers (brigades, areas, points), in relation to a production, exploitation, repair and maintenance of objects of railway transport, their systems and elements, including the ground of technology of productive processes.</p> <p><b>FK 10.</b> Ability to apply methods and facilities of the technical measuring, technical regulations, standards and other normative documents at the technical diagnosticating of objects of railway transport, their systems and elements.</p> <p><b>FK 11.</b> Ability to apply modern programmatic facilities for development of project-designer and technological documentation from creation, exploitation, repair and maintenance of objects of railway transport, their systems and elements.</p> <p><b>FK 12.</b> Ability to organize the action of the system of accounting and account (administrative, statistical, technological) of work of objects and systems of railway transport, carry out office work, documenting and quality management in obedience to normatively-legal acts,</p>
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	<p>instructions and methodologies.</p> <p><b>FK 13.</b> Ability to analyse the техніко-економічні and operating indexes of objects of railway transport, their systems and elements with the aim of exposure and removal of negative factors and increase of efficiency of productive process.</p> <p><b>FK 14.</b> Ability to organize their own work, subordinates and subordinate units in accordance with the requirements of occupational safety, safety and fire safety at the objects of railway transport during their construction, operation and repair.</p>
<b>7 – Programmatic results of studies</b>	
<p><b>Programmatic results of educating are on speciality (certain the standard of higher education of speciality)</b></p>	<p><b>PRN 1.</b> To describe principle of action by means of scientific conceptions, theories and methods and check up results at planning and application of devices, devices and systems of transport.</p> <p><b>PRN 2.</b> To apply knowledge and understanding of differential and integral calculation, algebra, functional analysis of the real and complex variables, vectors and matrices, vectorial calculation, differential equalization at ordinary and partial derivatives, row of Fourier, statistical analysis, information, numeral methods theory for the decision of theoretical and applied tasks.</p> <p><b>PRN 3.</b> To identify the objects of railway transport, their system, elements, descriptions and parameters taking into account specialization.</p> <p><b>PRN 4.</b> To determine the parameters of objects of railway transport, their systems and elements by realization of measuring experiment with the estimation of his results.</p> <p><b>PRN 5.</b> To use information and of communication technologies, applied and specialized programmatic foods for the decision of tasks of planning and adjusting of the electronic systems, to demonstrate skills of programming, analysis and reflection of results of measuring and control.</p> <p><b>PRN 6.</b> To know basic technological operations, technological equipment, technological rigging, facilities of automation and mechanization that used in exploitation, repair and maintenance of objects of railway transport, their systems and elements.</p> <p><b>PRN 7.</b> To own bases of development and applying in industry of documentation in relation to definiteness of technological processes of building, exploitation, repair and maintenance of objects of railway transport, their systems and other instructional pointing, rules and methodologies.</p> <p><b>PRN 8.</b> To determine and identify the mathematical models of technological objects at development in the computer environment of the new difficult electronic systems and choice of optimal decision.</p> <p><b>PRN 9.</b> To design the difficult real-time systems and facilities of collection and treatment of information, concerted with the set informative and programmatic facilities by application of software for the embedded systems on the basis of microcontrollers.</p> <p><b>PRN 10.</b> To know features and able to develop requirement specifications and technical requirements on planning of objects of</p>

	<p>railway transport, his systems and separate elements; to fold the plans of placing of equipment, technical rigging and organization of workplaces, expect loading of equipment and indexes of quality of products.</p> <p><b>PRN 11.</b> To know the substantive provisions of normatively-legal and legislative acts of Ukraine in the field of railway transport, Rules of technical exploitation of railways of Ukraine, instructions and recommendations from exploitation, repair and maintenance of objects of railway transport, their systems and elements.</p> <p><b>PRN 12.</b> To use the documentation related to professional activity, with application of modern technologies and facilities of office equipment; to use English, including a technicals, for a communication with specialists, realization of literary search and reading of texts on technical and professional subjects.</p> <p><b>PRN 13.</b> Able to master new knowledge, progressive technologies and innovations, find new unconventional decisions and facilities of their realization; to answer the requirements of flexibility in overcoming of obstacles and gaining end, rational use and setting of norms of time, discipline, responsibility for the decisions and activity.</p> <p><b>PRN 14.</b> To adhere to the norms of modern business and professional Ukrainian.</p> <p><b>PRN 15.</b> To find out skills of independent and collective work, leader internalss, organize work in the terms of the limited time with an accent on professional honesty.</p> <p><b>PRN 16.</b> To know features and able to develop requirement specifications and technical requirements on planning of objects of railway transport, his systems and separate elements; to fold the plans of placing of equipment, technical rigging and organization of workplaces, expect loading of equipment and indexes of quality of products.</p> <p><b>PRN 17.</b> To demonstrate skills of realization of the experimental researches related to professional activity; to perfect measuring methodologies; to control authenticity of the got results</p> <p><b>PRN 18.</b> To execute the calculation of basic descriptions and parameters of technological processes of production and repair of objects of railway transport with the aim of their comparison and forming of administrative decisions in relation to the further functioning of enterprise with the estimation of quality of his products.</p>
<p><b>Programmatic results of studies are with specialization (certain establishment of higher education)</b></p>	<p><b>PRNC 1.</b> Able to use the gained professional knowledge for the calculation of technical and economic and operating indexes of objects of railway transport, their systems and elements.</p> <p><b>PRNC 2.</b> To know setting and specific of work of structural subdivisions of linear enterprises and plants, small collectives of performers (brigades, areas, points), in relation to a production, exploitation, repair and maintenance of objects of railway transport, their systems and elements.</p> <p><b>PRNC 3.</b> To develop project-designer and technological documentation from creation, exploitation, repair and maintenance of objects of railway transport, their systems and elements, using the specialized modern programmatic facilities.</p> <p><b>PRNC 4.</b> To know and expect the basic indexes of accounting and account (administrative, statistical, book-keeping and financial) of enterprise during exploitation and repair of objects and systems of railway transport.</p>

	<p><b>PRNC 5.</b> Able to expect the technical and economic and operating indexes of objects of railway transport, their systems and elements.</p> <p><b>PRNC 6.</b> To know the basic requirements of labour, accident, fire-prevention safety and sanitary-hygenic mode prevention protection during realization of professional activity</p>
<b>8 – Resource providing of realization of the program</b>	
<b>Skilled providing</b>	Answers skilled requirements in relation to providing of realization of educational activity in the field of higher education according to the current legislation of Ukraine (Resolution of cabinet of ministers of Ukraine «About claim of the Licensed terms of realization of educational activity of establishments of education» from December, 30 in 2015 № 1187, addition 12).
<b>Logistical support</b>	Answers requirements in relation to logistical support of realization of educational activity in the field of higher education according to the current legislation of Ukraine (Resolution of cabinet of ministers of Ukraine «About claim of the Licensed terms of realization of educational activity of establishments of education» from December, 30 in 2015 № 1187, addition 13).
<b>Informative and educational and methodical providing</b>	Answers requirements in relation to the informative and навчально-методичного providing of realization of educational activity in the field of higher education according to the current legislation of Ukraine (Resolution of cabinet of ministers of Ukraine «About claim of the Licensed terms of realization of educational activity of establishments of education» from December, 30 in 2015 № 1187, addition 14).
<b>9 – Academic mobility</b>	
<b>National credit mobility</b>	On the basis of bilateral agreements between the National technical university the «Kharkiv polytechnic institute» and by the leading technical universities of Ukraine.
<b>International credit mobility</b>	On the basis of bilateral agreements between the National technical university the «Kharkiv polytechnic institute» and by educational establishments of higher education of foreign countries-partners.
<b>Studies of foreign bread-winners of higher education</b>	It is possible after the study of course of Ukrainian.

## 2. List of components of the educationally-professional program

### 2.1. List of components EP

Code	Components of the educational program (disciplines, projects / of work, practical worker, qualifying work)	Amount credits ECTS	Form of final control
1	2	3	4
<b>OBLIGATORY COMPONENTS OF EDUCATIONAL PROGRAM</b>			
<b>1. Cycle of general preparation</b>			
ZP 1	History and culture of Ukraine	4	Examination (1)
ZP 2	Foreign language P.1-P.6	12	Diff. test (1-3,7,8), Examination (4)
ZP 3	Higher mathematics P.1-P.4	19	Examination (1-4)
ZP 4	Physicist P. 1-P.3	13	Examination (1-3)
ZP 5	Ukrainian	3	Examination
ZP 6	Ecology	3	Diff. test
ZP 7	Chemistry	4	Examination
ZP 8	Jurisprudence	3	Diff. test
ZP 9	Philosophy	3	Examination
ZP 10	Physical education 1-6	12	Diff. test (1-6)
<b>2. Cycle of professional and practical preparation</b>			
<b>Professional preparation is after speciality</b>			
PP 1	Sketch geometry, engineering and computer graphic arts	4	Examination
PP 2	A prelude is of speciality	3	Diff. test
PP 3	Flat rate of railways	5	Examination
PP 4	Theoretical mechanics	5	Diff. test
PP 5	Resistance of materials	5	Diff. test
PP 6	Heating engineering	5	Examination
PP 7	Theory of mechanisms and machines	6	Examination
PP 8	Theory of construction materials	4	Diff. test
PP 9	Electrical engineering	4	Examination
PP 10	History of scitech	3	Diff. test
PP 11	Bases of professional safety and health of man	3	Examination
PP 12	Interchangeability, standardization and technical measuring	3	Examination
PP 13	Details of machines	3	Examination
PP 14	Economy of enterprise	3	Diff. test
<b>Practical preparation</b>			
PP 15	Practice	6	Diff. test
PP 16	Attestation	6	Defence
<b>General volume of obligatory components :</b>		<b>144</b>	

### SELECTIVE COMPONENTS OF EDUCATIONAL PROGRAM

Code	Components of the educational program (disciplines, projects/of work, practical worker, qualifying work)	Amount credits ECTS	Form of final control
1	2	3	4
<b>3. Blocks of choice of professional preparation</b>			
<b>3.1 A block of disciplines is 01 «Locomotives and locomotive establishment»</b>			
VB 1.1	Bases of information technologies	5	Examination
VB 1.2	Theory of automatic control P. 1, P. 2	11	Diff. test (1) Examination (2)
VB 1.3	Hauling occasion of rolling stock P. 1, P. 2	10	Examination (1-2)
VB 1.4	Elements of automated электропривода	5	Diff. test
VB 1.5	Control system by the rolling stock P. 1, P. 2	10	Examination (1-2)
VB 1.6	Theory of traction of trains	6	Examination
VB 1.7	Hauling transmissions of power	4	Examination
VB 1.8	Diagnostics and measuring are on a rolling stock	5	Diff. test
VB 1.9	The brake systems and safety of motion are on a rolling stock	4	Examination
VB 1.10	Mechanical part of rolling stock	4	Examination
VB 1.11	Off-line power units	4	Examination
VB 1.12	Technology of production and repair of rolling stock	4	Examination
VB 1.13	Design of processes of work of railway transport	4	Examination
VB 1.14	Ancillariess of rolling stock	4	Diff. test
VB 1.15	Exploitation and maintenance of rolling stock	4	Examination
	<b>Total:</b>	<b>84</b>	
<b>3.2 The block of disciplines is 02 «Logistic on a railway transport»</b>			
VB 2.1	Information technologies are on a rolling stock	5	Examination
VB 2.2	Bases of theory of automatic control P. 1, P. 2	11	Diff. test (1) Examination (2)
VB 2.3	Hauling occasion of rolling stock (mechanical part)	5	Examination
VB 2.4	Hauling occasion of rolling stock (electric part)	5	Examination
VB 2.5	An automatic electric drive is on a rolling stock	5	Diff. test
VB 2.6	Control system on the railways of P. 1, P. 2	10	Examination (1-2)
VB 2.7	Bases of locomotive traction	6	Examination
VB 2.8	Logistic on the railway transport of P. 1, P. 2	8	Examination (1-2)
VB 2.9	Measuring and diagnostics is on a diesel-electric rolling stock	5	Diff. test
VB 2.10	Bases of safety of motion are on railways	4	Examination
VB 2.11	Mechanical part of diesel-electric rolling stock	4	Examination
VB 2.12	Production and repair of diesel-electric rolling stock	4	Examination
VB 2.13	Design of objects of rolling stock	4	Examination
VB 2.14	Equipment of rolling stock	4	Diff. test
VB 2.15	Exploitation of diesel-electric rolling stock	4	Examination

	<b>Total:</b>	<b>84</b>	
<b>3.3 Blocks of choice of general preparation</b>			
BC 1	Discipline 1	4	Diff. test
BC 2	Discipline 2	4	Diff. test
BC 3	Discipline 3	4	Diff. test
<b>Total volume of selective components :</b>		<b>96</b>	
<b>TOTAL VOLUME OF EDUCATIONAL PROGRAM</b>		<b>240</b>	

## 2.2 Structural-logical chart EP

Semester	Table of contents of educational activity
1	ZP1, ZP2, ZP3, ZP4, ZP7, ZP10, PP1, PP2
2	ZP2, ZP3, ZP4, ZP5, ZP6, ZP10, PP3, VBx.1
3	ZP2, ZP3, ZP4, ZP8, ZP10, PP4, PP5, PP6
4	ZP2, ZP3, ZP9, ZP10, PP7, PP8, PP9, VBx.2
5	ZP10, PP10, PP12, PP13, VBx.2, VBx.3, VB1.4, VB2.5
6	ZP10, PP11, VB1.3, VB2.4, VB1.5, VBx.6, VBx.7, VB2.8
7	ZP2, PP14, VB1.5, VB2.6, VBx.8, VBx.9, VBx.10, VBx.11
8	ZP2, VBx.12, VBx.13, VBx.14, VBx.15, PP15, PP16

**DISTRIBUTION OF MAINTENANCE OF EDUCATIONALLY-PROFESSIONAL PROGRAM IS AFTER GROUPS OF COMPONENTS AND CYCLES OF PREPARATION**

Cycle of preparation	Volume of the educational loading of bread-winner higher education (credits of ECTS / %)		
	General components EPP	Selective components EPP	All after all term studies
Cycle of general preparations	76/31,7	-	76/31,7
Cycle of professional preparations	56/23,3	108/45	164/68,3
<b>All for all term studies</b>	132/55	108/45	240/100

### 3. Form of attestation of bread-winners of higher education

Attestation of graduating students of the educational program of speciality **273 the «Railway transport»** is conducted in form defence of qualifying bachelor work and completed to the выдачою document of standard pattern about awarding of baccalaureate with the appropriation of qualification: «**Bachelor of railway transport»** after specializations «**Locomotives and locomotive establishment»** and «**Logistic on a railway transport»**. Attestation comes true openly and publicly.



#### 4. Matrix of accordance to the programmatic competencies components of the educational program

	ZP 1	ZP 2	ZP 3	ZP 4	ZP 5	ZP 6	ZP 7	ZP 8	ZP 9	ZP 10	PP 1	PP 2	PP 3	PP 4	PP 5	PP 6	PP 7	PP 8	PP 9	PP 10	PP 11	PP 12	PP 13	PP 14	PP 15	PP 16	
ZK 1		+	+	+	+	+	+			+	+			+	+	+			+			+	+				
ZK 2			+	+			+		+			+	+				+	+	+	+		+	+	+	+	+	+
ZK 3					+																						
ZK 4		+																									
ZK 5											+															+	+
ZK 6					+				+												+						
ZK 7		+			+																						
ZK 8	+	+						+	+	+												+			+		
ZK 9	+							+	+													+					
ZK 10						+		+		+			+									+					
ZK 11																							+			+	+
ZK 12								+	+			+	+								+					+	+
ZK 13	+							+																			
ZK 14	+					+			+	+											+						
FK 1								+					+														
FK 2												+	+														
FK 3																											
FK 4																											
FK 5					+																				+		

	ZP 1	ZP 2	ZP 3	ZP 4	ZP 5	ZP 6	ZP 7	ZP 8	ZP 9	ZP 10	PP 1	PP 2	PP 3	PP 4	PP 5	PP 6	PP 7	PP 8	PP 9	PP 10	PP 11	PP 12	PP 13	PP 14	PP 15	PP 16	
<b>FK 6</b>																		+			+			+			
<b>FK 7</b>								+																	+		
<b>FK 8</b>																											
<b>FK 9</b>																									+		
<b>FK 10</b>																							+				
<b>FK 11</b>											+															+	+
<b>FK 12</b>					+			+																	+		
<b>FK 13</b>																											
<b>FK 14</b>																						+					

	<b>VB 1.1.</b>	<b>VB 1.2.</b>	<b>VB 1.3.</b>	<b>VB 1.4.</b>	<b>VB 1.5.</b>	<b>VB 1.6.</b>	<b>VB 1.7.</b>	<b>VB 1.8.</b>	<b>VB 1.9.</b>	<b>VB 1.10.</b>	<b>VB 1.11.</b>	<b>VB 1.12.</b>	<b>VB 1.13.</b>	<b>VB 1.14.</b>	<b>VB 1.15.</b>	<b>VB 2.1.</b>	<b>VB 2.2.</b>	<b>VB 2.3.</b>	<b>VB 2.4.</b>	<b>VB 2.5.</b>	<b>VB 2.6.</b>	<b>VB 2.7.</b>	<b>VB 2.8.</b>	<b>VB 2.9.</b>	<b>VB 2.10.</b>	<b>VB 2.11.</b>	<b>VB 2.12.</b>	<b>VB 2.13.</b>	<b>VB 2.14.</b>	<b>VB 2.15.</b>
<b>ZK 1</b>	+						+	+	+	+	+	+		+	+	+		+	+		+		+	+	+	+	+		+	+
<b>ZK 2</b>		+	+		+	+						+	+		+	+		+	+			+	+		+	+	+			+
<b>ZK 3</b>																														
<b>ZK 4</b>																														
<b>ZK 5</b>	+	+		+									+			+				+	+								+	
<b>ZK 6</b>	+															+														
<b>ZK 7</b>	+															+														
<b>ZK 8</b>																										+				
<b>ZK 9</b>								+																	+					
<b>ZK 10</b>				+				+	+						+		+								+	+				
<b>ZK 11</b>								+																	+					
<b>ZK 12</b>												+			+												+			+
<b>ZK 13</b>																														
<b>ZK 14</b>																														
<b>FK 1</b>					+				+			+			+						+				+		+			+
<b>FK 2</b>			+	+			+		+	+	+		+	+				+	+							+	+	+	+	
<b>FK 3</b>	+							+					+		+										+			+		
<b>FK 4</b>												+			+												+			+

	<b>VB 1.1.</b>	<b>VB 1.2.</b>	<b>VB 1.3.</b>	<b>VB 1.4.</b>	<b>VB 1.5.</b>	<b>VB 1.6.</b>	<b>VB 1.7.</b>	<b>VB 1.8.</b>	<b>VB 1.9.</b>	<b>VB 1.10.</b>	<b>VB 1.11.</b>	<b>VB 1.12.</b>	<b>VB 1.13.</b>	<b>VB 1.14.</b>	<b>VB 1.15.</b>	<b>VB 2.1.</b>	<b>VB 2.2.</b>	<b>VB 2.3.</b>	<b>VB 2.4.</b>	<b>VB 2.5.</b>	<b>VB 2.6.</b>	<b>VB 2.7.</b>	<b>VB 2.8.</b>	<b>VB 2.9.</b>	<b>VB 2.10.</b>	<b>VB 2.11.</b>	<b>VB 2.12.</b>	<b>VB 2.13.</b>	<b>VB 2.14.</b>	<b>VB 2.15.</b>
<b>FK 5</b>												+			+												+			+
<b>FK 6</b>												+									+						+			
<b>FK 7</b>												+															+			
<b>FK 8</b>					+										+															+
<b>FK 9</b>												+			+												+			+
<b>FK 10</b>								+																+						
<b>FK 11</b>	+												+			+												+		
<b>FK 12</b>																														
<b>FK 13</b>								+							+									+					+	+
<b>FK 14</b>									+																+					

**5. Matrix of providing of programmatic results of studies (PRN) of the educational program corresponding components**

	ZP 1	ZP 2	ZP 3	ZP 4	ZP 5	ZP 6	ZP 7	ZP 8	ZP 9	ZP 10	PP 1	PP 2	PP 3	PP 4	PP 5	PP 6	PP 7	PP 8	PP 9	PP 10	PP 11	PP 12	PP 13	PP 14	PP 15	PP 16	
PRN 1				+	+		+		+					+	+	+	+	+	+				+		+	+	
PRN 2			+																							+	+
PRN 3												+	+								+					+	+
PRN 4																							+				
PRN 5											+															+	+
PRN 6												+															
PRN 7					+																				+		
PRN 8			+	+																						+	+
PRN 9																											
PRN 10											+		+													+	
PRN 11						+		+																			
PRN 12		+																									
PRN 13	+									+																+	+
PRN 14					+																					+	+
PRN 15									+	+															+	+	+
PRN 16											+		+										+				
PRN 17																							+				
PRN 18																									+		

	ZP 1	ZP 2	ZP 3	ZP 4	ZP 5	ZP 6	ZP 7	ZP 8	ZP 9	ZP 10	PP 1	PP 2	PP 3	PP 4	PP 5	PP 6	PP 7	PP 8	PP 9	PP 10	PP 11	PP 12	PP 13	PP 14	PP 15	PP 16	
PRN C1														+	+	+	+	+	+				+		+	+	
PRN C2												+													+		
PRN C3											+															+	+
PRN C4			+					+																	+	+	+
PRN C5																											
PRN C6						+	+															+					

	VB 1.1.	VB 1.2.	VB 1.3.	VB 1.4.	VB 1.5.	VB 1.6.	VB 1.7.	VB 1.8.	VB 1.9.	VB 1.10.	VB 1.11.	VB 1.12.	VB 1.13.	VB 1.14.	VB 1.15.	VB 2.1.	VB 2.2.	VB 2.3.	VB 2.4.	VB 2.5.	VB 2.6.	VB 2.7.	VB 2.8.	VB 2.9.	VB 2.10.	VB 2.11.	VB 2.12.	VB 2.13.	VB 2.14.	VB 2.15.
PRN 1		+	+	+		+	+		+	+	+		+	+			+	+	+	+		+				+		+	+	
PRN 2		+											+				+											+		
PRN 3				+			+		+	+	+			+				+	+							+			+	
PRN 4	+							+								+								+						
PRN 5	+												+			+												+		
PRN 6					+							+			+						+		+				+			+
PRN 7																														
PRN 8													+															+		
PRN 9	+							+								+								+						
PRN 10																														
PRN 11					+				+						+						+					+				+
PRN 12	+															+														
PRN 13				+																+			+			+				
PRN 14																														
PRN 15																														
PRN 16																														
PRN 17								+																+						
PRN 18												+															+			

	<b>VB 1.1.</b>	<b>VB 1.2.</b>	<b>VB 1.3.</b>	<b>VB 1.4.</b>	<b>VB 1.5.</b>	<b>VB 1.6.</b>	<b>VB 1.7.</b>	<b>VB 1.8.</b>	<b>VB 1.9.</b>	<b>VB 1.10.</b>	<b>VB 1.11.</b>	<b>VB 1.12.</b>	<b>VB 1.13.</b>	<b>VB 1.14.</b>	<b>VB 1.15.</b>	<b>VB 2.1.</b>	<b>VB 2.2.</b>	<b>VB 2.3.</b>	<b>VB 2.4.</b>	<b>VB 2.5.</b>	<b>VB 2.6.</b>	<b>VB 2.7.</b>	<b>VB 2.8.</b>	<b>VB 2.9.</b>	<b>VB 2.10.</b>	<b>VB 2.11.</b>	<b>VB 2.12.</b>	<b>VB 2.13.</b>	<b>VB 2.14.</b>	<b>VB 2.15.</b>
<b>PRN C1</b>	+		+	+		+	+		+	+	+		+	+	+	+		+	+			+	+			+		+	+	+
<b>PRN C2</b>												+			+								+					+		+
<b>PRN C3</b>	+											+			+	+											+			+
<b>PRN C4</b>															+															+
<b>PRN C5</b>				+			+		+	+	+			+				+	+				+			+			+	
<b>PRN C6</b>																														