Attachment2

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"Development of a flexible, innovative and practical framework for Work-based Learning in higher education of Armenia and Russia" (FlexWBL)

Don State Technical University
WBL Integrated Curriculum

Components	Definition
1. Placement of the Programme	*Information needed: Code, title, qualification, duration, number of students, internal & external students, aim of WBL* ***Code*:** 23.04.01 Transport processes technology; ***Title*:** Transport logistics; ***Qualification:*** Master's degree (extramural) ***Number of students, internal & external students*:** 20 students, all of them are studying and working simultaneously. ***The aim of the programme:*** to prepare graduates for: - technological, organizational, planning and managerial activities in the field of technical and commercial operation of vehicles and transport-technological complexes within the transport system of the country; - organizing rational interaction of different modes of transport within a single transport system based on the logistics principles; - organizing secure operation of the transport complex. ***The aim of WBL*:** to prepare professionals with knowledge and practical skills in the field of transport and logistics systems management, taking into account the digital transformation of transport and the requirements of modern society. The programme aims to prepare a workforce that is receptive to innovation, capable of independent search of information, possessing the teamwork skills, sense of responsibility and desire to create. Students receive theoretical and practical knowledge in the field of transport logistics from the leading DSTU professors, as well as practicians working at regional and national enterprises of transport and road sector and in the field of information technology. ***Partners:*** Expert evaluation of the courses is carried out by academic and

	industry partners. Academic partners of the programme: Moscow Automobile and Road Construction State Technical University (MADI), St. Petersburg State University of Architecture and Civil Engineering, (SPbGASU), Oryol State University named after I.S. Turgenev, Volgograd State Technical University, Shandong Transport University (PRC), Berg University (Wuppertal, Germany), University of Applied Sciences (Bern, Switzerland), Stellenbosch University (South Africa). Non Academic partners of the programme: Rostov Oblast Ministry of Transport, Rostov-on-Don City Department of Roads and Traffic, Association of Transport Engineers, PJSC "VympelCom" (Beeline). ***Duration of study:*** 2 years 6 months, 120 credits (equal to 4320 academic hours). The timetable includes theoretical in-class studies (face-to-face, blended or distant), practicum (WBL and practices/internships), self-study, intermediate and final attestations. ***The mode of study:*** The programme envisages courses' variability and flexibility, i.e. due to modular nature, courses can be adapted to suit the practical interests of Master students. Individual educational paths can be developed and distant learning can be used. The blended and distant e-learning technology may be applied for conducting classes, internships, monitoring the progression and interim attestation of students. Digital learning implies joint work of students and teachers, as well as independent work of students using electronic courses, electronic educational resources and e-libraries that are part of digital educational environment of the university (e.g.: DSTU digital learning environment - SKIF and other e-learning platforms). ***Programme Leader*** - Ph.D, Prof. Vladimir V. Zyrianov ***Teachers:*** Ph.D, Liubov V.Eremina, Anton Y.Mamoiko ***Chair***: "Organisation of Transportation and Road Traffic"
2. Qualification for Access	*Degrees, entrance tests, accreditation of prior learning (practical/theoretical), Define the personal learning paths* Admission: 1. Bachelor or Specialist Higher Education Diploma. 2. Complex exam in the direction of Transport logistics, which includes algebra and basic mathematical calculations, statistics, etc.
3. Leading Principles	*Define the leading principles for the programme.* The uniqueness of this programme – is application of WBL and the latest achievements of science and technology in the field of organization, planning and management of technical and commercial operation transport systems of cities and regions. The most important feature of this programme is possibility for students to take the individual educational trajectory. This

	opportunity is realised through students' choice of subject - specific Modules and variable disciplines. Moreover the "Employer Modules" have been developed, which allow students to get first-hand training in the modern trends in transport industry from the teachers holding leading managerial positions at the enterprises of industry. In order to broaden students' horizons and enable them to acquire knowledge from different professional areas, the "minors" (interrelated subjects of the same profile differing from the main direction of the student's training) have been developed and are offered to students. "Minors" allow students to develop additional competences. Given the current market situation, the programme motivates students to study information technologies and intelligent transport systems. Upon graduation students will be able : - To specify the basic concepts and principles of smart logistics in Industry 4.0 infrastructure (course - Logistics 4.0.) - To distinguish the holistic structure of urban transport system, methodologies of its planning and management, as well as principles of its development and functioning, with a focus on sustainability and liaison with transport policy (course - Sustainable transport systems). - To apply Big Data technology to create 'smart cities' and 'smart transport infrastructure', explore the Big Data potential for efficient real-time management of urban traffic (course - Big Data in Transport). - To assess acute problems in logistics planning, organisation and management during production and post-production periods; to control deliveries within supply chains; to plan, organise and manage the logistics services and manpower flow (course - Logistics of storage and distribution complexes). - To plan, organize and manage freight transportation within a broad scope of transport systems (course - Transportation Logistics of Freight Systems). - To develop supply chains within a transport complex and observe specifics of their management (course – Smart supply chains management in a transport complex).
4. University Courses Accompanying WBL	*Define the titles, credits and workload of the accompanying university courses.* *Define possibilities for distance-learning courses* In the programme the logical sequence of in-class study and work-based learning in observed, ensuring the formation of the whole set of competencies. The curriculum indicates the workload per disciplines, modules, practices, etc. in credit units, as well as in hours. The Master's programme consists of the following blocks: Block 1 "Disciplines (modules)" – basic and variable ones (the latest imply the work-based learning component). Block 2 "Practicum and research work" – a variable part of the programme (implies the work-based learning component), Block 3 'State Final Attestation' - culminates in awarding the qualification after passing the Final project/work.

	Disciplines (modules) of the basic part of the programme are compulsory for students. The set of basic disciplines (modules) is determined independently by the university according to specification of the Federal State Educational Standard (FSES) of Higher Education for the direction/domain of study. Master students are given the opportunity to choose not less than 30 % of the variable part of Block 1. The number of lecturing hours is not more than 20 % of the total number of in-class hours. The rest workload is practice-oriented learning including work based learning. The implementation of the competence approach provides for the wide use of active and interactive forms of classes in the educational process (computer simulations, business and role-playing games, case studies, psychological and other trainings) in combination with work-based and extracurricular work in order to form and develop professional skills of students. The training sessions include meetings with representatives of transport companies, master classes given by experts and specialists from the Ministry of Transport and the Department of Transport. The following in-class courses are accompanying WBL: - Society, environment and transport - Foreign language - General transport - Organizational and production structures in transport - Traffic organization - Organization of transport services and safety of the transport process - Fundamentals of safe vehicle operation - Basics of logistics
5. Contents/Syllabus of University Courses	*Define the contents/syllabus of the accompanying university courses.* Subject specific disciplines (modules) of the variable part of the Master's programme including research work (R&D) and work-based learning component are as follows: - Transport process documentation - Planning the transport operation of a company - Transport and logistics systems modelling - Design of intermodal transport hubs - Business process management in transport - Sustainable development of transport systems - Passenger transportation - Ecological transport services - Automated transport systems - Smart supply chains management in a transport complex. - Machine learning in transport logistics - Transport logistics - Freight/cargo transportation - Python for Data analysis in transport

	The syllabuses of the subject specific courses have been developed in collaboration with industry representatives - members of the State Attestation Commission. Thus students' learning outcomes reflect the labour market demand. Final attestation assignments and projects are also elaborated and assessed with participation of the industry representatives - members of the State Attestation Commission.
6. Learning Outcomes of University Courses	*Define the learning outcomes considering the types, depth and fields of knowledge.* *Define competences students will gain through the courses.* Upon completion of Subject specific disciplines (modules) the students will reach the following learning outcomes: ***1) ability to perform experimental and research activities:*** - to participate in fundamental and applied research in the field of professional activity; - to analyse the quality indicators of objects of professional activity using the necessary methods and means of research; - to create the models to predict the properties of objects of professional activity; - to develop plans, programmes and methods of research for the professional activity objects; - to analyse, synthesize and optimize the quality of testing and certification of products and services with application of problem-oriented methods; - to estimate the efficiency of traffic systems organization and security; - to retrieve and analyse the information about the objects of research; - to implement the results of research from technical and organizational perspective; - to analyse the research results and develop the proposals for its implementation; - to justify and apply the new information technologies; - to participate in the development of draft specifications and requirements, standards and technical descriptions, normative documentation for new objects of professional activity; - to form the objectives of the project (programme) aimed at solving transport problems, define criteria and indicators for achievement of this objective, identify the priorities of problem solution taking into account indicators of economic and ecological safety; - to develop the generalized solutions for the problems, analyse these solutions, predict the consequences, find a compromise solution in case of multi-criteria and uncertainty; - to design plans for the development of transport enterprises, traffic management systems; - to use information technologies in development of the new transport and technological schemes; - to participate in drawing up practical recommendations for research results application and development; *2)* **ability to fulfil organisational and managerial activities:** - to organize the work of a team of executors; - to select, justify, adopt and implement the managerial

	decisions in case of different opinions; - to determine the work order; - to organise and prepare the initial data for justification of scientific, technical and organisational decisions on the basis of economic analysis; - to improve the organisational and management structure of enterprises and objects of professional activity; - to carry out the cost-benefit analyses of production units; - to find a compromise between different requirements (cost, quality, safety and deadlines) in long and short term planning and define a rational solution; - to organise and improve the accounting and documentation system; - to select and develop the rational standards of operation and storage of vehicles and equipment; - to ensure the efficiency and safety of transport and technological systems for the delivery of goods; - to organize the technical control and quality management of products and services; - to control the traffic management systems; - to organize the work with clients; - to develop transport and transport equipment operation safety systems; - to improve the personnel remuneration system; - to prepare and develop the certification and licensing documents.
7. Contents of Workplace Learning	*Define the contents/syllabus of the WPlearning.* Forms of WBL training within the extramural curriculum: - internships - an integral part of the educational programme, providing students with experience in applying the theoretical knowledge into practice and deeper understanding of the content of the profession under study. It may be paid or unpaid. Generally provides credit towards a degree; - apprenticeship – a part of educational programme for young employees working at the enterprises and simultaneously studying at the university, which includes a combination of theoretical in-class studies (about 20-30 % of the total duration of training) and practical mastering of the profession at the workplace in the process of productive work. The duration of the training can vary from a few months to several years. Trainees are paid for the duration of their training. - practicum – students carry out applied, professionally oriented projects. The projects are implemented with the use of information resources and material base of enterprises, and allow students to get acquainted with modern production technologies and gain experience in solving applied tasks. This type of training promotes informed choice of profession. ***Internships:*** The programme envisages five phases of internships: one academic, two industrial and one pre-graduation. Along with research work internships help student to prepare the final qualification project/work which has the form of a well elaborated project for the field of organisation the freight or

	passenger transportation on road transport. The programme is implemented in collaboration with DSTU long-term partners - the leading academic and non-academic institutions and industrial enterprises. Taking into account the current market situation, the educational programme aims to motivate graduates to establish and launch their own payback projects. Academic practice for acquiring basic professional skills – 2 weeks. Industrial internship - scientific research practice - 8 weeks. Industrial internship - practical technological training to acquire professional skills and experience – 2 weeks. Pre-graduation practice to acquire professional skills and experience - 6 weeks Total of 48 ETCS (credits) Industry representatives are included in the State Attestation Commission: 1.Solonsky K.Y. - Deputy Head of the City Administration for Transport and Road Facilities 2. Lashenko K.V. - Deputy Director General of UP "MTC Rostovpassazhirtrans". 3. Tamrazyan N.A. - Head of Traffic Organisation Division of Department of Roads and Traffic of Rostov-on-Don 4.Naumenko E.Y. - Director of "Yuzhny Technical Centre" Ltd. 5.Tretiakov A.I. - Deputy Director of the Department of Roads and Traffic of Rostov-on-Don
8. Assessment and Recognition	*Define appropriate forms of assessment for the university courses and WP learning.* *Define an appropriate overarching assessment for the WBL programme.* ***Assessment of university courses*** Funds of assessment tools and specific forms and procedures for current control and interim attestation are elaborated for each discipline. These funds include: control questions and sample tasks for laboratory and practical classes, tests, colloquiums, banks of test assignments, sample topics of course projects (works), essays and other forms of control, allowing to assess the knowledge, skills and level of acquired competence. Throughout the programme the level of knowledge and skills obtained by the students is measured by means of case studies, tests, public presentations of own projects. Students write a research essays, final tests containing about 3 open problematic issues. They prepare final work/project for public presentation. Students can choose the topic. ***Assessment of WBL*** Students take an active part in developing the real project "Comprehensive scheme of public transport services in the Rostov agglomeration". They participate in creation of a database register of urban and interurban routes of passenger transport, of regular urban transport ubfrustructure (indicating

	the stops and timetable). List of topics for graduates' thesis and final projects: • Organisation of intermodal transport; • Organisation of multimodal transport; • Investment programme for the development of road transport enterprises; • International road transport management; • Improving the economic efficiency of road transport enterprises; • Design of transport and logistics system in urban conditions; • Organization of logistics support of cargo flows; • Technological design of road transport enterprises; • Routing and organization of cargo transportation; • Traffic flow optimization to ensure the transit flow of road transport; • Optimization of motor transport expenses for transportation service; • Routes network optimization; • Organization and management of transport; • Organisation of passenger transport logistics; • Transport technology, organization and management; • Organisation of transport support for the company's sales network; • Organization of motor transport service of a terminal complex; • Use of monitoring systems in the organisation of international road transport; • Analysis and ways of optimization of the road transport goods supply; • Transport and financial plan of a road transport enterprise; • Development of measures to upgrade the rolling stock of the taxi fleet.
9. Else that can be Considered?	*Define the terms of approval Define the guidelines from external persons/organisations/stakeholders concerning the curriculum Define the margin of development within the existing curriculum Define the possibility/margin of flexible study timetable* The work-based learning component of the study programme is ensured by inviting practicians and business people working in the transport and information technology sectors such as: Ministry of Transport of Rostov Oblast, Department of Roads and Traffic Management of Rostov-on-Don, Association of Transport Engineers, VympelCom PJSC.