



### CATALOG OF ELECTIVE COMPONENT DISCIPLINES

EDUCATIONAL PROGRAM

8D07159 - Transport, transport equipment and technologies

Level of education: doctoral studies

Time of study: 3 years

Year of admission: 2023 y.

Module	Cycle	Component	Name of discipline	Total labor input		Semester	Learning outcomes	Brief description of the discipline	Prerequisites	Post requisites	Department
				in academic hours	in academic credits						
1	2	3	4	5	6	7	8	9	10	11	12
Module 1 - Scientific-Pedagogical Competencies	BD	EC	Mathematical modeling of dynamic processes of transport engineering	150	5	1	ON3, ON5	Consists of the following modules: Dynamics of the unsprung mass of the rolling stock and the effect on it of vertical, longitudinal inelasticity of the railroad track; Simulation of the motion of the wheel pair of the crew on the inelastic track in the vertical plane; Classification of areas of instability of dynamic systems; Methods and methods of determining areas of parametric resonances, Qualitative study of the body of the crew, referred to different planes of symmetry; Forced vibrations of the crew with a high center of gravity.	Bachelor's and Master's disciplines	RWDS, FC, Research Practice	RS
			Fundamentals of patenting and intellectual property protection				ON2, ON5	The discipline outlines the practical issues of creation, maintenance and inclusion in the economic turnover of intellectual property objects. Consists of the following modules: general information about the results of intellectual activity, the process of obtaining knowledge: innovations and innovations, the results of intellectual activity and patent strategies, the methodology of obtaining new technical solutions, ensuring the completeness of the protection of the results of intellectual activity, the methodology of preparing an application for a patent.			

1	2	3	4	5	6	7	8	9	10	11	12
Module 2 - Profile Competencies	PD	EC	Methods of evaluation of serviceability restoration of parts and units of transport equipment	150	5	1	PO4, PO5	Consists of the following modules: goals and objectives of the technological preparation of production for the restoration of parts, designing a technological process for the restoration of parts, the choice and justification of the restoration methods, the choice and evaluation of the quality of machining after restoration of parts, resource-saving technologies used during repair, organization and evaluation of the economic efficiency of the restoration of parts of transport equipment.	Bachelor's and Master's disciplines	RWDS, FC, Research Practice	RS
			Optimization of train traffic control				PO4, PO5	The purpose of the discipline is to form the doctoral students skills in solving the problems of control processes of operation of railway rolling stock, the development of optimal options for train traffic control. Consists of the following modules: simulation of train movement; analysis of indicators of optimal train control; determination of energy-optimal modes of train operation using numerical optimization methods.	Bachelor's and Master's disciplines	RWDS, FC, Research Practice	RS
<b>Total</b>				<b>300</b>	<b>10</b>						

Head of the department "Rolling stock"

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