



RTU Course "Vehicle Mechanics"
15325 Teorēt.mehānikas un materiālu pretestības katedra

General data

Code	MTM514
Course title	Vehicle Mechanics
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Mechanics, Mechanical Engineering, Machine Building
Responsible instructor	Grāpis Ojārs
Volume of the course: parts and credits points	1 part, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV, RU
Possibility of distance learning	Not planned
Maximum auditorium capacity	25
Maximum number of students per semester	50
Abstract	Accidental processes play an important role in nature. The poor quality of the road pavement, which is the unevenness of a casual nature is the reason for railway car and autotransport dynamic load. These factors are taken into account at the process of vehicle design. We should be able to measure these factors and evaluate them.
Goals and objectives of the course in terms of competences and skills	State random function theory methods of calculating fluctuations in the system vehicle mechanics. In order to achieve this aim the following tasks should be fulfilled: 1st Measure and evaluate the quality of the road pavement; 2nd solve the statistical mechanics tasks; 3rd Provide mechanical stress calculation methods.
Structure and tasks of independent studies	Within the framework of the present course the student should perform independent work on the following topics: 1st Provide differential equation formulation techniques; 2nd Determine the natural frequency of vehicle movements; 3rd Volatility shapes.
Recommended literature	Advances in Automobile Engineering, p.III, Noise and Vibration, Ed.G. H. Tidbbury, Oxford. Pergamon press, 1965. Спрвочник ВИБРАЦИИ В ТЕХНИКЕ, том 3, - Колебания машин, конструкций и их элементов. Moskva, "Mašinostojenije", 1980
Course prerequisites	Physics (at the secondary school level). RTU differential and integral calculations.

Course outline

Theme	Hours
Case motion mechanism impact on the road, rail transport.	8
Cases, motion characteristics, the measurement and rationing.	8
Mathematical models of gamma various stages of design.	10
Discrete, continual, and mixed models, linear and nonlinear.	10
Active and passive vibration isolation system.	10
Model reduction.	10
Case loads, the effects on people.	8

Learning outcomes and assessment

Learning outcomes	Assessment methods
At the end of the course students will be able to assess problems in the system with random inspiration	Questions at the end of the lecture.
At the end of the course students will be able to use the numerical characteristics of random motion in the field of railway transport	Questions at the end of the lecture.
At the end of the course students will be able to use the numerical characteristics of random motion in the field of road transport	Questions in the practical work
At the end of the course students will be able to carry out the dynamic task calculations	Questions in the practical work
At the end of the course students will be able to apply the theory of mechanical system analysis	Exam

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	4.0	6.0	2.0	2.0	0.0		*	