

Course description

Code: 2Y023	Abbr: TRV	Title: Theory of Rail Vehicles	
MSc. degree programme in: 5.2.4 Motor Vehicles, Rail vehicles, Ships and Aeroplanes For specialisation in: Rail Vehicles			
Lecturer:	prof. Dr. Ing. Juraj GERLICI		
Semester: winter	Number of hours: <i>Lectures - Seminars - Laboratory work</i>		ECTS Credits: 6
Recommended:	Per week: 3 – 2 - 0	Total per semester: 39 + 26	
Prerequisites: Theory of Transport Means			
Assessment: oral examination			
Aims and objectives: Students are acquainted with the specific areas typical of the field of rail vehicles design and their running in operation. The subject is suitable as a presupposition for the professional specialisation subjects, design and computational projects. The subject provides the students with the basic professional knowledge suitable for the study of rail vehicles specialisation in Slovakia and in abroad.			
Course content: Rail transport description, tracks and their classification. Basic parameters of vehicles, types and description, transitional cross-section and silhouette. Geometrics characteristics of wheel/rail contact. Tangential forces transition mechanism, adhesion of wheel/rail system. Computational models of wheel/rail contact. Vehicle in a straight track (stability, critical speed), track radius transition. Forces displacement at radius transition. Track and vehicle resistance forces, basic track traction characteristics, systems of power transition. Rail vehicles brakes, brake power. Vehicles suspensions, rail vehicles oscillations.			
Recommended texts: KALKER, J., J.: <i>Three-dimensional elastic bodies in rolling contact</i> . Kluwer academic publishers, Dordrecht, Netherlands, 1990 JACOBSON, B. – KALKER, J., J.: <i>Rolling contact phenomena</i> . CISM Courses and Lectures No. 411. International Centre for Mechanical Sciences. ISBN- 3-211-83332-3 Springer-Verlag Wien New York. CISM, Udine, 2000 IWNICKY, S.: <i>Handbook of Railway Vehicle Dynamics</i> . CRC Press , Taylor & Francis Group ISBN 0-8493-3321-0, Boca Raton London New York 2006. WICKENS, A.H.: <i>Fundamentals of Rail Vehicle Dynamics, Guidance and Stability</i> , Advances in Engineering 6, Swets & Zeitlinger, B. V. Lisse, 2003, ISBN 90-265-1946-X AMBROSIO, J. A.C.: <i>Advances in Computational Multibody Systems</i> , Springer 2005, ISBN 1-4020-3392-3			
Note:		Date of the last revision: 05.12. 2022	