

Information sheet for the course
Mechanics of special mobile equipment movement

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| University: <i>Alexander Dubček University of Trenčín</i> | |
| Faculty: <i>Faculty of special technology</i> | |
| Course unit code: <i>UŠMT/I/1-65/d</i> | Course unit title: <i>Mechanics of special mobile equipment movement</i> |
| Type of course unit: <i>compulsory</i> | |
| Planned types, learning activities and teaching methods: <i>Lecture 2 hours weekly, seminar 1 hours weekly, semestral thesis 16 hours per semester</i> | |
| Number of credits: <i>6</i> | |
| Recommended semester: <i>1st semester in the 1st year (full-time)</i> <i>1st semester in the 1st year (part-time)</i> | |
| Degree of study: <i>II. (engineer)</i> | |
| Course prerequisites: <i>none</i> | |
| Assessment methods: <i>100 % attendance - seminars, fulfillment of laboratory exercises goals, 60 % attendance - lectures, correctly elaborated semestral thesis, proving the knowledge of subject content in written and oral examination.</i> | |
| Learning outcomes of the course unit: <i>Student will acquire comprehensive overview of kinematic and dynamic analysis of mechanical systems with a focus on the mechanics of car movement. He/she will learn to analyze and solve kinematic and dynamic effects on special mobile equipment locomotory system, learn how to apply general procedures of mechanics to the actual structural components of cars, know basic principles of cars mechanisms dynamic resistance. To achieve that students will understand and manage application of general objectives for mechanical movement of modern special mobile equipment on wheeled chassis.</i> | |
| Course contents: <i>Introduction to the theory of movement of vehicles. Environment - human - vehicle (car). Wheel rolling (wheel function, strength and reactions acting on the wheel, wheel rolling while lateral force acts). Driving resistances (rolling, incline, air, inertia and trailer resistance). Adhesion force. Balance of powers and performance, distribution of forces and moments in gear-box (parasitic powers). Dynamic behavior of vehicle in straight driving, internal forces and moments acting on vehicle. Theoretical and actual braking efficiency and braking stability, ideal braking forces. Directional stability of vehicle (critical speed, cornering stability, aerodynamic stability, shear, rollover). Longitudinal and transverse stability of vehicle. Impact of chassis configuration on vehicle stability. Theory of vehicle suspension (oscillations, damping, driving comfort). Ground clearance of special vehicles.</i> | |
| Recommended of required reading: <i>ERENCEY, V., VALA, M. Konštrukcia špeciálnej mobilnej techniky. Mechanika pohybu kolesových vozidiel. [skriptá] 1. vyd. - Trenčín: TnUAD, 2009. - 139 s.</i> <i>JAMRICOVÁ, Z., STODOLA, J. Mechanika pohybu špeciálnej mobilnej techniky na kolesových podvozkoch. 1. vyd. - Trenčín: TnUAD, 2014. - 121 s. - ISBN 978-80-8075-181-1</i> <i>VLK, F. Úlohy z dynamiky motorových vozidel. Nakladatelství VLK. Brno 2011. ISBN 80-238-6574-9.</i> <i>VLK, F. Dynamika motorových vozidel. Nakladatelství VLK. Brno 2003. ISBN 80-239-0024-2.</i> <i>VALA, M., BRAUN, P. Vojenská kolová vozidla. II.diel. Teorie pohybu vozidel. VA Brno 1998.</i> <i>ELIÁŠ, J.: Mobilná technika na kolesových podvozkoch [skriptá]: charakteristiky, technické údaje a popis/. - 1.vyd. - Trenčín: TnU AD, 2002. - 338 s. - ISBN 80-88914-62-0Vydavateľstvo EDIS, Žilina 2011. ISBN 978-80-554-0385-4.</i> | |
| Language: <i>Slovak</i> | |
| Remarks: <i>Compulsory subject</i> | |

Evaluation history:*Total number of students being evaluated:*

| A | B | C | D | E | FX |
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Lecturers: *prof. Ing. Jiří Stodola, DrSc. - lecturer***Last modification:** *15.4.2014***Supervisor:** *prof. Ing. Alexej Chovanec, CSc., guarantee of the study program „Maintenance and Repair of Special Mobile Technology“.*