

Univerza v Ljubljani
Fakulteta *za strojništvo*

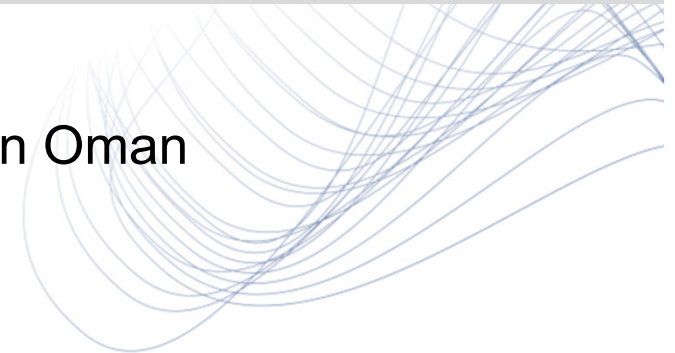


Katedra za strojne elemente
in razvojna vrednotenja



VEHICLE DYNAMICS – Introduction

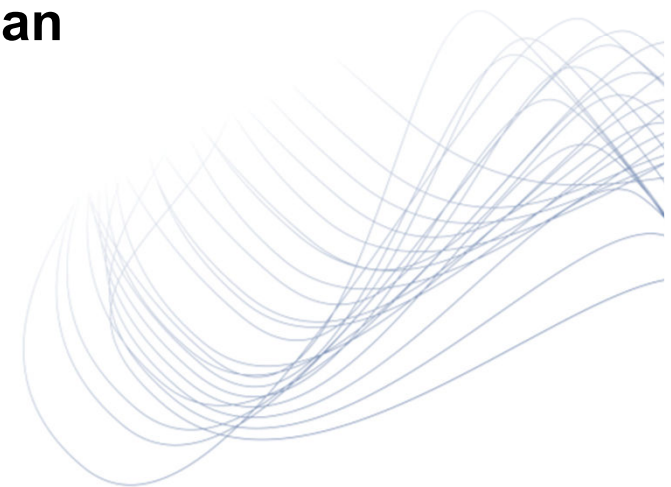
assist. prof. Simon Oman





Basic facts

- *No. of lecture hours: 30*
- *No. of exercise hours: 30*
- *Beginning of lectures: 12:00*
- **Lecturer: assist. prof. Simon Oman**
 - *Lecturer's room: 506*
 - *Tel.: +386-(0)1-4771506*
 - *E-mail: simon.oman@fs.uni-lj.si*
- **Assistant: assist. prof. Simon Oman**





Study rules

- *2 colloquia from theoretical content*
- *2 exam dates at the end of semester*
- *3 exercises:*
 - *1st exercise: Dynamic characteristics of a vehicle during acceleration or driving with a constant velocity*
 - *2nd exercise: Practical tasks in the field of vehicle braking and acceleration*
 - *3rd exercise: Vertical response of a vehicle when driving over the obstacle*
 - *3rd alternative: Seminars on: electric vehicles, hybrid vehicles, autonomous drive*
- *Obligatory presence at exercises is 80%*
- *Positive grade from exercises is a prerequisite for attending the written and oral (optional) part of the exam at the end of the course*



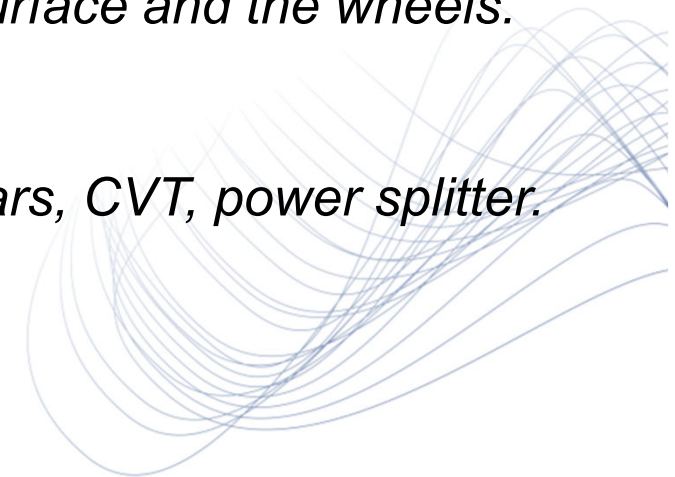
Study rules

- *How to pass the „Vehicle Dynamics“ course:*
 - (1) *An average grade from colloquia is bigger or equal to 5.01, with no grade less than 4.5. To get the grade in VIS information system, a student needs to enroll her/himself for the course exam until the end of the school year.*
 - (2) *The average grade from colloquia is less than 5.01 and one colloquium is positive. At the first exam to which the student is enrolled only a content of the worse colloquium is checked.*
 - (3) *Although present, a student was not successful at the two colloquia as described in options (1) or (2). At the first exam to which the student is enrolled only the theoretical content of the course is checked. The student receives no questions related to the exercise part.*
 - (4) *Full exam proof: theoretical content and exercises.*



Course content

- *Interaction: vehicle, user, operating conditions. Vehicle effectiveness.*
- *Diving resistances, engine characteristics, mechanical transmission, traction forces balance, hybrid transmission.*
- *Equation of motion and maximum tractive effort.*
- *Chassis suspension types and dynamic model of a vehicle.*
- *Elements of a mechanical transmission system: driving engine, clutch, gear box, differential gear drive, tire.*
- *Tire as a link between a ground surface and the wheels.*
- *Differential and angle gear drive.*
- *Gear box with fixed number of gears, CVT, power splitter.*
- *Tire alignment angles.*





Seznam literature / *List of references*

- Klemenc J.: Dinamika vozil – predloge k predavanjem. Ljubljana: UL-FS, 2016. (in Slovene language)
- Proceedings of Wprld Automotive Congress FISITA 2014. Maastricht: KIVI NIRA, 2014.
- Lewis R., Olofsson U. (editors): Wheel-rail interface handbook. Boca Raton: Woodhead Publishing in Mechanical Engineering, 2009.
- Wong J.Y.: Theory of Ground Vehicles, 3rd edition. New York: John Willey & Sons, 2001.
- Gillespie T.D.: Fundamentals of Vehicle Dynamics. Warrendale: SAE, 1992.
- Simić D.: Motorna vozila. Beograd: Naučna knjiga, 1988. (in Serbian language)
- Janičijević N., Janković D., Todorović J.: Konstrukcija motornih vozila. Beograd: Mašinski fakultet, 1979. (in Serbian language)