Study program: Road Traffic Engineering

Course title: Modern Systems of Motor Vehicles

Professor/assistant: Branislav Aleksandrović

Type of course: Compulsory

ECTS credits: 6

Prerequisites: none

Aims of the course:
Students gain knowledge about the structure of a motor vehicle and contemporary mechatronic systems. Students gain necessary knowledge regarding construction characteristics, components and work of contemporary vehicle systems. Students understand the principles of working, roles of certain systems and their influence on the motor vehicle, and have wide range of abilities in the area of contemporary vehicle systems, with the aim of enhancing functionality and security of the vehicle.

Learning outcomes:
The student is familiar with the structure of a motor vehicle, the role and principles of working of contemporary vehicle systems. The student has the necessary knowledge about how contemporary mechatronic-system components work (the braking system, suspension, steering system, transmission, system for managing engine functions). The students are familiar with compliance of contemporary vehicle systems with current regulations.

Syllabus:
Theoretical part:
Vehicles – basics. Structure of a motor vehicle. Propulsion – the engine, transmission, braking system, suspension, steering system, frame. Contemporary mechatronic systems of a vehicle – basics (control system and automatization, accelerator, gearbox, cap-size and pitching, microelectronics, executive devices, electronic steering unit). The specifics of contemporary mechatronic systems of the vehicle: steering petrol and diesel engines, braking systems and systems for dynamic management, an anti-lock braking system (ABS), the dynamic systems (ESP, ASR, ACC). Passive safety systems (air bags, inertial switches).
Practical part:
Auditory exercises – term papers and presentations
Lab exercises – students are acquainted with contemporary vehicle systems in laboratories, its structure and performance, features and the way of working.

Literature:

1. Janićijević N., Janković D., Todorović J.: Konstrukcija motornih vozila, Mašinski fakultet Beograd, 2001.
2. Demić M.: Projektovanje putničkih automobila, Mašinski fakultet u Kragujevcu, 2004.
3. Grujović A.: Elektronika automobila, Mašinski fakultet u Kragujevcu, 2008.

Total number of active classes: 5	**Lectures:** 3	**Practical classes:** 2

Teaching methods: Lectures, auditive exercises, writing term papers, lab exercises

Grading system (maximum 100 points)
grading scale from 5 to 10: below 51 points grade 5, grade 6 from 51- 60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91- 100 points.

Pre-exam obligations:	**Points:**	**Final exam:**	**Points:**
Activity during lectures	max 5	Oral exam	50
Practical training	max 5		
Written test(s)	max 20		
Term papers	max 20		
Minimum requirement for the final exam	30		