

Study program / course: Mechanical engineering			
Type and level of study: Bachelor academic studies			
Course: Mechanics of the traffic accident			
Lecturers: Aleksandra S. Jankovic, Ph.D., full prof., Gordana R. Jovicic, Ph.D., docent			
Status of course: Obligatory for module M₈, VI semester			
Number of ECTS: 6			
Precondition: passed Mechanics 1 exam, attended Mechanics 2 and Mechanics 3 classes			
The objective of course			
Mechanical engineers, whose interest is directed to motor vehicles, must know the dynamics of impact applied to participants in traffic, all categories of automobiles and pedestrians. The objective of such an approach to impact dynamics is for engineers to participate in the work related to car body design in a sense of knowing limit forces, in reconstruction of traffic accidents and in problems of traffic safety in general. This is the fundament for vehicle collision modeling and testing of their aggressiveness. This course should be complementary to methods of traffic accident expertise done by road traffic engineers according to their own methods.			
The outcome of course			
Student masters the fundamental laws of impact mechanics and non-deformable bodies' collision. He acquires knowledge on collision processes between real traffic participants, on influence of automobile's structure on compression phase and restitution phase of an impact. He knows about the ways of conducting the crash tests and using the crash test's results. He knows to apply the impact mechanics equations in function of determination of incoming and outgoing speed of participants in a traffic accident for different kinds and types of collision.			
Syllabus			
Theoretical study			
Mechanics of impact (quantity of motion, moment of momentum, impact impulse, kinetic energy during impact and collision). Types of collisions between the two vehicles. Vehicle impact to fixed barrier. Quantification of impact, equivalent speed. Frontal, side and rear impact. Vehicles roll over. Descent from the road. Measures of deformation movements of vehicle in different situations. Deformation rates. Automobile-bike collision. Automobile-pedestrian collision. Bike-pedestrian collision.			
Practical classes			
Exercises, independent work based on real traffic accident data. Research on the subject of influence of vehicle conception on behaviour during frontal collision.			
Recommended reading			
1. Janković, A., Simić, D.: „Automobile safety”, Chapters 3, 8 and 10, (in Serbian), „DSP–mekatronik”, Kragujevac, 1996			
The number of hours of active teaching:			Other classes:
Theory: 3	Practical classes: 0.6	Other forms of teaching: 0.4	Research study: 0
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Methods of teaching			
Lectures. Exercises and individual work.			
Evaluation of knowledge			
Pre-final exam obligations	points	Final exam	points
Activities during the classes:	5	written exam	45
Practical classes:			
Colloquiums(s) :	30		
Seminar(s) :	20		

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