Faculty of Mechanical Engineering / ROAD TRAFFIC / ERGONOMICS IN TRAFFIC

Course:	ERGONOMICS IN TRAFFIC			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
11497	Mandatory	6	5	2+2+0
Programs	ROAD TRAFFIC			
Prerequisites	None			
Aims	The aim of studying the subject is to acquire the knowledge necessary to understand the ergonomic characteristics of road vehicles and their impact on the exploitation and safety of road vehicles			
Learning outcomes	The course will enable students to understand the mutual influence of the design of the vehicle and its systems, the characteristics of the safety system, the principles of their functioning, the adaptation of the vehicle structure and the characteristics of the interaction between the driver/passenger and the vehicle in order to achieve optimum efficiency, effectiveness, comfort, safety and health, protection of road users and other traffic participants; familiarization with the importance of the influence of the human factor in the functioning of the system and mutual interaction; knowledge, understanding and training to find ways to eliminate or reduce hazards; defining principles for informing system participants about preventive measures that need to be taken, about the nature of mistakes that drivers and road users can make; optimizing the decision-making process by taking into account objective and subjective risk assessment; ways of reducing consequences and injuries in traffic; the effects of applying different designs of vehicles and road equipment; modelling and simulation methods used in security analysis			
Lecturer / Teaching assistant	Ph.D Sreten Simović			
Methodology	Lectures and auditory exercises; consultations through a combined/digital approach to learning based on the synergy between educational technology and real/virtual environment (video case studies, critical analysis of presented material, audio-visual support, etc), individual projects, individual and team presentations, consultations			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction to the subject and method of teaching; Origin and development of ergonomics			
I week exercises	Introduction to the subject and method of teaching; Origin and development of ergonomics			
II week lectures	Man-machine-path-work environment system			
II week exercises	Man-machine-path-work environment system			
III week lectures	Types of ergonomics; Goals and tasks of ergonomics			
III week exercises	Types of ergonomics; Goals and tasks of ergonomics			
IV week lectures	Physiological anthropology; Anthropometry; Physiological principles of managing the movement of parts of the human body; Physiological-anthropological analysis of driving comfort			
IV week exercises	Physiological anthropology; Anthropometry; Physiological principles of managing the movement of parts of the human body; Physiological-anthropological analysis of driving comfort			
V week lectures	Statistics in ergonomics; Harmonic anthropometric analysis			
V week exercises	Statistics in ergonomics; Harmonic anthropometric analysis			
VI week lectures	Access, working position, working space, design of working and living space in road vehicles; Biomechanics and ergonomics			
VI week exercises	Access, working position, working space, design of working and living space in road vehicles; Biomechanics and ergonomics			
VII week lectures	Colloquium I			
VII week exercises	Colloquium I			
VIII week lectures	Physical methods for ergonomic injury risk assessment in traffic sub-processes			
VIII week exercises	Physical methods for ergonomic injury risk assessment in traffic sub-processes			
IX week lectures	Biological rhythm, working hours, shift work, breaks, fatigue; Professional stress of drivers; Behavioural cognitive methods; Cognitive judgment of the environment and traffic conditions			
IX week exercises	Biological rhythm, working hours, shift work, breaks, fatigue; Professional stress of drivers;			

	Behavioural cognitive methods; Cognitive judgment of the environment and traffic conditions
X week lectures	Methods of general analysis; Methods of error analysis and workload and situation analysis
X week exercises	Methods of general analysis; Methods of error analysis and workload and situation analysis
XI week lectures	Human factor in driving; Driver behaviour and driver modelling; Knowledge of modern theories on behaviour models, occurrence and prevention of accidents, risk perception within psychomotor and cognitive processes, human performance
XI week exercises	Human factor in driving; Driver behaviour and driver modelling; Knowledge of modern theories on behaviour models, occurrence and prevention of accidents, risk perception within psychomotor and cognitive processes, human performance
XII week lectures	Path perception; Modelling of vehicles; Modelling of vehicle safety elements; Assessment of security systems
XII week exercises	Path perception; Modelling of vehicles; Modelling of vehicle safety elements; Assessment of security systems
XIII week lectures	Human errors in traffic behaviour; Perceptual driver response time and driver reaction time; Mechatronic driver assistance systems; Auxiliary systems for controlling the dynamic behaviour of the vehicle
XIII week exercises	Human errors in traffic behaviour; Perceptual driver response time and driver reaction time; Mechatronic driver assistance systems; Auxiliary systems for controlling the dynamic behaviour of the vehicle
XIV week lectures	Modelling of vehicle behaviour in critical situations; Analysis of the accident from the point of view of the vehicle; Navigation systems, driver activity monitoring systems and speed limit systems
XIV week exercises	Modelling of vehicle behaviour in critical situations; Analysis of the accident from the point of view of the vehicle; Navigation systems, driver activity monitoring systems and speed limit systems
XV week lectures	Colloquium II
XV week exercises	Colloquium II
Student workload	

Per week	**Per semester**
5 credits x 40/30=6 hours and 40 minuts 2 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises **2 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts** Total workload for the subject: **5 x 30=150 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **30 hour(s) i 0 minuts** Workload structure: **106 hour(s) i 40 minuts (cources), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)**
Student obligations	Attendance of lectures and exercises (live or online)
Consultations	Consultations in the office and online (every working day)
Literature	Bhise V:: Ergonomics in the automotive design process, CRC Press, Taylor & Francis Group, 2012. Gkikas N.: Automotive ergonomics, Driver-vehicle interaction, CRC Press, Taylor & Francis Group, 2013. Fuller R., Santos J. A.: Human factors for highway engineers, Accident analysis and prevention, Elsevier science, 2002. Čičević S.: Praktikum iz osnova ergonomije, Faculty of Transport and Traffic Engineering, Belgrade, 2010. Muftić O.: Biomehanička ergonomija, Faculty of Mechanical Engineering and Shipbuilding, Zagreb, 2006. Lukić J.: Kompleksna udobnost vozila, Monography, University in Kragujevac, Faculty of Mechanical Engineering, 2011. Peters G., Peters B.: Automotive vehicle safety, Taylor & Francis, 2002. Scmitt K. U., Niederer P., Muser M. H., Walz F.: Trauma Biomechanics - Accident Injury in Traffic and Sports, Springer, 2004. Rothengatter T., Huguenin R.: Traffic & Transport psychology, Theory and application, Elsevier, 2004.
Examination methods	Class attendance: 5 points; I colloquium: 30 points; II colloquium: 30 points; Final test: 35 points; A passing grade is obtained if at least 51 points are accumulated cumulatively
Special remarks	

Comment						
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points