Faculty of Mechanical Engineering / ENERGY EFFICIENCY / ENERGY EFFICIENCY IN TRAFFIC AND COMMUNAL SYSTEMS

Course:	ENERGY EFFICIENCY IN TRAFFIC AND COMMUNAL SYSTEMS			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
12476	Mandatory	3	5	2+2+0
Programs	ENERGY EFFICIENCY			
Prerequisites	No conditions			
Aims	Introduction to the basic concepts of energy efficiency in transport and utility systems. Acquiring basic knowledge about the connection between energy, fuel and water consumption and CO2 emissions. Identification and monitoring of energy efficiency indicators in transport and utility systems. Introduction to measures that lead to the improvement of energy efficiency in transport and utility systems.			
Learning outcomes	Students who successfully pass this course will be able to: 1. Identify and monitor energy efficiency indicators in transport and utility systems; 2. Calculate CO2 emissions based on energy consumption in traffic; 3. Understand and apply measures to improve energy efficiency in transport; 4. Understand and apply measures to improve energy efficiency in the functioning of water supply and sewerage; 5. They also understand the application of energy use measures from the municipal waste management process			
Lecturer / Teaching assistant	Prof. dr Radoje Vujadinović, Prof. dr Goran Sekulić			
Methodology	Lectures, calculation exercises, seminar papers and consultations			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Energy efficiency in traffic and utility systems - basic terms			
I week exercises	Energy efficiency in traffic and utility systems - basic terms			
II week lectures	Energy efficiency indicators in traffic			
II week exercises	Energy efficiency indicators in traffic			
III week lectures	CO2 emissions from transport and climate change			
III week exercises	CO2 emissions from transport and climate change			
IV week lectures	Measures to improve energy efficiency (traffic management, vehicle maintenance, intelligent transport systems, use of alternative fuels, economic instruments)			
IV week exercises	Measures to improve energy efficiency (traffic management, vehicle maintenance, intelligent transport systems, use of alternative fuels, economic instruments)			
V week lectures	Measures to improve energy efficiency (energy optimization of driving conditions and techniques, traffic regulation)			
V week exercises	Measures to improve energy efficiency (energy optimization of driving conditions and techniques, traffic regulation)			
VI week lectures	Improving energy efficiency in air, sea and rail transport			
VI week exercises	Improving energy efficiency in air, sea and rail transport			
VII week lectures	The first colloquium			
VII week exercises	The first colloquium			
VIII week lectures	Energy efficiency in water supply and sewerage systems			
VIII week exercises	Energy efficiency in water supply and sewerage systems			
IX week lectures	Reduction of water losses in the system, installation of frequency regulators at pumping plants, change of type of pumping plants, introduction of charging system according to real consumption			
IX week exercises	Reduction of water losses in the system, installation of frequency regulators at pumping plants, change of type of pumping plants, introduction of charging system according to real consumption			
X week lectures	Energy efficiency in the process of managing municipal solid waste generated in urban areas			
X week exercises	Energy efficiency in the process of managing municipal solid waste generated in urban areas			

XI week lectures	Waste material recycling. Thermal treatment of waste material. Incineration using heat
XI week exercises	Waste material recycling. Thermal treatment of waste material. Incineration using heat
XII week lectures	Biological methods for energy utilization. Sanitary disposal.
XII week exercises	Biological methods for energy utilization. Sanitary disposal.
XIII week lectures	Development of energy efficiency improvement plans at the city level
XIII week exercises	Development of energy efficiency improvement plans at the city level
XIV week lectures	The second colloquium
XIV week exercises	The second colloquium
XV week lectures	
XV week exercises	
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	Students are required to attend classes and exercises and take all colloquia
Consultations	
Literature	[1] Bradbrook, Adrian John: Energy Efficiency in Road Transport-UNEP Handbook for Drafting Laws on Energy Efficiency and Renewable Energy Resources. United Nations Environment Programme, United Kingdom, 2007.. [2] Pierre Advenier, Pierre Boisson, Claude Delarue, André Douaud, Claude Girard, Michel Legendre : Energy efficiency and CO2 emissions of road transportation: Comparative analysis of technologies and fuels, World Energy Council- 18th Congress, Buenos Aires, October 2001. [3] European Conference of Ministers of Transport-Council of Ministers: Monitoring Of CO2 Emissions From New Cars, CEMT/CM(2003)10, Mart 2003. [4] Hickman J.: PROJECT REPORT SE/491/98 Methodology for calculating transport emissions and energy consumption, TRANSPORT RESEARCH LABORATORY, London,1999,
Examination methods	
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