

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

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| 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 | | | |
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| 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 |