

Information sheet for the course Energetics and Environment

University: <i>Alexander Dubček University of Trenčín</i>	
Faculty: <i>Faculty of Industrial Technologies in Púchov</i>	
Course unit code: <i>MI-I-PV-9E</i>	Course unit title: <i>Energetics and Environment</i>
Type of course unit: <i>optional</i>	
Planned types, learning activities and teaching methods: <i>Lecture: 2 hours weekly/26 hours per semester of study; face to face</i> <i>Seminar: 2 hours weekly/26 hours per semester of study; face to face</i> <i>Laboratory tutorial:</i>	
Number of credits: <i>5</i>	
Recommended semester: <i>2nd semester in the 1st year full-time</i> <i>2nd semester in the 1st year part-time</i>	
Degree of study: <i>the 2nd degree of study (Engineer's degree)</i>	
Course prerequisites: <i>none</i>	
Assessment methods: <i>Student will elaborate the project focused on alternative energy sources. Each student will present finished project in the form of ppt presentation to lecturer and students on the seminar. After the presentation, student will answer the questions during the discussion. After passing of all Lecturers and exercises focused on selected energy calculations, students will pass the written examination which will be focused on theoretical knowledge, knowledge and skills from energy calculations obtained during the semester. The successful defense of project and acquirement 50 points in minimum from written examination are minimum conditions for obtaining of credits.</i>	
Learning outcomes of the course unit: <i>Student will acquire knowledge from the area of alternative renewable energy sources. Student knows relations and relationships between classical and alternative energy sources and reduction of negative influences on environment and human health. Student understands the basic principles of technological process, design and functionality of modern equipment for utilization of alternative energy sources. Student can analyze and evaluate solved problem and he is able to design the solution for prevention of negative influences of energy management on environment.</i>	
Course contents: <ol style="list-style-type: none"><i>1. Basic types of industrial furnaces, the principle of work and characteristics.</i><i>2. Energy sources, classification, definitions. Classical energy sources. Alternative, renewable energy sources.</i><i>3. Types of alternative energy sources. Solar energy – interaction between solar radiation and earth atmosphere (with objects surface), absorbance, transmittance, reflectance.</i><i>4. Ways of utilization of solar energy, passive solar energy management, basic elements of solar architecture, Trombe wall, properties of materials, thermal capacity, thermal isolation.</i><i>5. Active solar systems, types of solar collector, solar thermal electricity production, photovoltaic effect, technologies of PV modules.</i><i>6. Wind energy – types of wind power plant, types of wind turbines, description and principle of work.</i><i>7. Main factors of efficiency of wind energy management, advantages and disadvantages of wind energy management, influences on environment.</i><i>8. Hydropower – principle of electricity production, classification of power plant, description of dam. Water wheels – classification, construction and principle of work.</i><i>9. Advantages and disadvantages of classical hydraulic power. Utilization of sea waves energy –</i>	

- description of equipment. Tidal power plant – principle of work and influence of environment.*
10. *Geothermal energy – characteristics of source. Heat pump – types of equipment, sources of input energy, principle of work.*
 11. *Geothermal energy of Slovakia and its utilization, geothermal energy in world, influence on environment.*
 12. *Energy of biomass – definition and formation of biomass, ways of energy utilization of biomass, types of biomass, fine products of biomass, advantages of energy utilization of biomass.*

Recommended of required reading:

1. LANGFELDER, I.A KOL.: *ENERGETIKA CHEMICKÉHO A POTRAVINÁRSKEHO PRIEMYSLU. BRATISLAVA: ALFA, 1992. 236 S. ISBN 80-88914-19-1*
2. RIEDEL, R.: *HOSPODAŘENÍ ENERGIEMI. PRAHA/BRATISLAVA: SNTL/ALFA, 1971. 252 S. ISBN: 04 - 404 - 71*
3. TOLGYESSY, J. LESNÝ, J.: *SVET HLADÁ ENERGIU. BRATISLAVA: OBZOR, 1979. 396 S. ISBN: 735-21-85/5*
4. BIENIK, J.: *ROPA, ZEMNÝ PLYN A ŽIVOTNÉ PROSTREDIE. BRATISLAVA: ALFA, 1982. 240 S.*
5. VOŠTA, J. MATĚJKA, Z. MACÁK, J.: *ENERGETIKA. PRAHA: VŠCHT, 1999. 249 S. ISBN 80-7080-358-4*

Language: *Slovak*

Remarks:

Evaluation history:

Number of evaluated students: *14*

A	B	C	D	E	FX
7.14	14.29	28.57	42.86	7.14	0.0

Lecturers: *prof. Ing. Darina Ondrušová, PhD., Ing. Jana Pagáčová, PhD.*

Last modification: *31.03.2014*

Supervisor: *prof. Ing. Darina Ondrušová, PhD.*