

Information sheet for the course Silicate Engineering

University: <i>Alexander Dubček University of Trenčín</i>	
Faculty: <i>Faculty of Industrial Technologies in Púchov</i>	
Course unit code: <i>MI-I-PV-14B</i>	Course unit title: <i>Silicate Engineering</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: 1 hour weekly/13 hours per semester of study; face to face</i> <i>Laboratory tutorial: 0 hour weekly</i>	
Number of credits: <i>4</i>	
Recommended semester: <i>3rd Semester in the 2nd year full-time</i> <i>3rd semester in the 2nd 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>Working out of written verification focused on obtained knowledge during semester.</i> <i>Minimum condition for obtain of credits is obtaining min. 50% points from written certification.</i>	
Learning outcomes of the course unit: <i>The student has summaries knowledge from sphere of thermal process of silicate engineering and equipment of thermal technique using in silicate industry. They can recognize the basic principles and mathematical description of process running in individual thermal-technical equipments for treatment of silicate materials. They can recognize the basic thermal-technical calculations and their knowledge they prove to apply at solution of concrete technical problems.</i>	
Course contents: <ol style="list-style-type: none"> <i>1. Process running at thermal treatment of materials in silicate industry.</i> <i>2. The basic types of industrial furnaces - classification, work principle of industrial furnaces.</i> <i>3. The classification and characterization of fuels - classification of fuels according to origin and consistency, characterization individual types of fuels, general properties of fuels. The depletion of the ozone layer - the ozone and ozone layer, the causes and consequences creation of the ozone hole, the possible solutions.</i> <i>4. Combustion, balance of combustion.</i> <i>5. The flow of gas - types of pressures and their description, the flow of gas in horizontal pipelines, vertical flow of gas, chimneys.</i> <i>6. Conductive heat transfer and calculations - Fourier's equation and her description, heat conduction planar wall, heat conduction cylindrical wall, thermal losses, insulation materials.</i> <i>7. Convective heat transfer and calculations - Newton's equation and her description, thermal criteria and flow criteria, heat conduction at spontaneous convection, heat conduction at forced convection.</i> <i>8. Radiation heat transfer and calculations - perfectly black solid, heat radiation between two perfectly black solids, heat radiation between two perfectly gray solids, heat radiation of gas and flame.</i> <i>9. Combined heat transport</i> <i>10. The heat exchangers - types of exchangers and their function, heat transfer in heat exchangers.</i> <i>11. Heat balance of the furnace - heat balance of the furnace without and with heat exchanger,</i> 	

thermal efficiency furnace. Periodically and continuously operating equipment and their differences.

12. *Non-stationary heat transfer - description of non-stationary heat transfer, Fourier's equation of non-stationary heat transfer, methods of solving differential equations.*

13. *Cooling, cooling curve, calculations*

Recommended of required reading:

1. *I Rédr, M. - Příhoda, M.: Základy tepelné techniky. Praha, SNTL, 1995. 669 s.*

2. *Rédr, M. - Gottwald, M. - Říman, A. - Rejč, R.: Tepelné výpočty a optimalizace vyzdívek průmyslových pecí. Praha, SNTL, 1975. 351 s. ISBN 40-408-75*

3. *Kuna, L.: Žiaruvzdorné výmurovky priemyselných pecí. Bratislava, SVTL, 1999. 205 S*

4. *Vošta, J. - Matějka, Z. - Macák, J.: Energetika. Praha: VŠCHT, 1999. 249 s. ISBN 80-7080-358-4*

Language: *Slovak*

Remarks:

Evaluation history: The total number of evaluated students: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Lecturers: *Ing. Darina Ondrušová, PhD.*

Last modification: *31.03.2014*

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