

**Information sheet for the course
Methods of Material Structure Evaluation**

| | |
|--|---|
| University: <i>Alexander Dubček University of Trenčín</i> | |
| Faculty: <i>Faculty of Industrial Technologies in Púchov</i> | |
| Course unit code: <i>TTN-P-25</i> | Course unit title: <i>Methods of Material Structure Evaluation</i> |
| Type of course unit: <i>compulsory</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: 0</i> <i>Laboratory tutorial: 2 hours weekly/26 hours per semester of study; face to face</i> | |
| Number of credits: <i>5</i> | |
| Recommended semester: <i>the 5th semester in the 3rd year full-time form of study</i> <i>the 5th semester in the 3rd year part-time form of study</i> | |
| Degree of study: <i>the 1st degree of study (Bachelor's degree)</i> | |
| Course prerequisites: <i>TTN-P-1 Material Science</i> | |
| Assessment methods: <i>active participation in the exercises according to study rules, test and examination in the subject.</i> | |
| Learning outcomes of the course unit: <i>Students obtain basic theoretical knowledge about the complexity of the structure solution fabrics. Emphasis is placed on the porosity and packing density. Furthermore, to gain knowledge about the fiber-dependency affecting the clothing textiles.</i> | |
| Course contents: <i>Fibers and fibrous formations - softness, substance library cross-section surface area, porosity and pore diameter, tensile strain and compress the fiber formation. Yarn - Yarn substance library diameter, depending on the diameter, twist and fineness, plied, the average number of fibers in the yarn. Woven and knitted -cover factor, strength, ripple and transverse deformation of yarn in woven and knitted fabrics. Fibers, fiber fineness, equivalent diameter fibers form factor, specific surface. Cross-sectional shape, Tensile stress in the fiber - relative strength fibers. Linear theory of mixing of the two components. Packing sensity - volume, area and density definition filling. Types of structures by filling, Equivalent pore diameter, porosity and average inter-fiber pore diameter, pore shape factor, absorbability textiles. Tensile stress fiber bundle, relative strength and elongation bundle of parallel fibers. Compression fiber material - Contacts between the fibers, bending deformation and pressure. Derive the formula for calculating the dependence of pressure to packing density. Denier, substance library section and the diameter of the yarn. Relative denier, the number of fibers in the cross section. Packing density yarn, yarn diameter. Kochlin theory twist intensity. Relationship between fineness, twist and yarn diameter calculating the average number of fibers in the yarn and the coefficient. Consider the validity of helical model. The dependence of the bending strength, torsion critical factor Solovjev strength. Model geometry fabrics and knitting fabrics.</i> | |
| Recommended of required reading: <i>1. Lizák, P., Militký, J.: Technické textilie, ISBN: 80-968674-0-7, Ružomberok, 2002.</i> <i>2. Lizák P.: Štruktúra materiálov, - Trenčín: TnU AD, 2013, dostupné na www.tnuni.sk v rámci projektu Digitalizácia TnU AD. Kód ITMS: 26110230009.</i> <i>3. Lizák, P.: Evaluation methods of materials structure, Krakow, Towarzystwo Slowaków w Polsce, 2011, ISBN: 978-83-7490-384-4, 86s.</i> | |
| Language: <i>Slovak</i> | |

| | | | | | |
|--|-------|-------|-------|-------|-----|
| Remarks: <i>the subject is provided only in the winter semester</i> | | | | | |
| Evaluation history: | | | | | |
| A | B | C | D | E | FX |
| 5.41 | 20.27 | 37.84 | 14.86 | 21.62 | 0.0 |
| Lecturers: <i>doc. Ing. Pavol Lizák, PhD.</i> | | | | | |
| Last modification: <i>16.03.2015</i> | | | | | |
| Supervisor: <i>doc. Ing. Pavol Lizák, PhD.</i> | | | | | |