

Information sheet for the course Physics of Solid Substances

University: <i>Alexander Dubček University of Trenčín</i>					
Faculty: <i>Faculty of Industrial Technologies in Púchov</i>					
Course unit code: <i>M-P-3</i>			Course unit title: <i>Physics of Solid Substances</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: 2 hours weekly/26 hours per semester of study; face to face</i> <i>Laboratory tutorial: 0</i>					
Number of credits: <i>8</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 3rd degree of study (PhD. degree)</i>					
Course prerequisites: <i>none</i>					
Assessment methods: <i>Every student following literature search develops the project themed by structure and physical properties of materials studied in his thesis. The project must be vindicated (60 points from 100 at least).</i>					
Learning outcomes of the course unit: <i>Students have an in-depth knowledge of mater structure, structure of solids, polymeric materials and composites, their physical properties and methods of investigation. Students have theoretical and practical skills, ability to use mathematics to solve physics problems of solid substances, critical thinking skills, effective written and oral communications skills.</i>					
Course contents: <i>Atomic theory of matter, present concept of matter structure, quantum nature of microcosm, standard model of elementary particles and forces, superstring theory of matter – quantum theory of hydrogen atom – macroscopic structure and physical properties of solids, polymers and polymeric nanocomposites, polymer/carbon nanotube nanocomposites, introduction to tensor calculus – quantum condensates as the fifth state of matter – electrical, thermal, mechanical, dynamic mechanical and rheological properties of solids and methods of their determination – phonon theory of heat transfer in solids, relationship between electrical, thermal, dynamic mechanical and rheological properties in solids – modeling of thermal transport, electrical and dynamic mechanical processes in solids using parametric fitting of experimental data, linear and nonlinear least squares method.</i>					
Recommended of required reading: <i>Feynman, R.: The Feynman Lecturers on Physics I-III, California Institute of Technology-Addison Wesley Longman, 1970, ISBN-10: 0201021153.</i> <i>Young, H. D., Freedman, R. A.: University Physics, Addison-Wesley, New York, 1996.</i> <i>Orendáč, M.: Základy experimentálnych metód vo fyzike kondenzovaných látok, Prírodovedecká fakulta, Univerzita Pavla Jozefa Šafárika v Košiciach, 2011, ISBN978-80-7097-871-9.</i> <i>Domáce a zahraničné odborné publikácie k téme dizertačnej práce.</i>					
Language: <i>Slovak</i>					
Remarks:					
Evaluation history:					
A	B	C	D	E	FX

Lecturers: <i>doc. Mgr. Ivan Kopal, PhD.</i>
Last modification: <i>30.04.2014</i>
Supervisor: <i>prof. Ing. Darina Ondrušová, PhD.</i>