

## Information sheet for the course Fracture Mechanics

<b>University:</b> <i>Alexander Dubček University of Trenčín</i>					
<b>Faculty:</b> <i>Faculty of Industrial Technologies in Púchov</i>					
<b>Course unit code:</b> <i>MI-I-PV-2A</i>			<b>Course unit title:</b> <i>Fracture Mechanics</i>		
<b>Type of course unit:</b> - <i>the given subject is <u>optional</u></i>					
<b>Planned types, learning activities and teaching methods:</b> <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>					
<b>Number of credits:</b> <i>5</i>					
<b>Recommended semester:</b> <i>the 2<sup>nd</sup> semester in the 1<sup>st</sup> year of the full-time form of study</i> <i>the 2<sup>nd</sup> semester in the 1<sup>st</sup> year of the part-time form of study</i>					
<b>Degree of study:</b> <i>the 2<sup>nd</sup> degree of study (Engineering degree)</i>					
<b>Course prerequisites:</b> <i>none</i>					
<b>Assessment methods:</b> <i>To accomplish the given subject, student is obliged to be present at the lessons with the reference to specifications introduced in the study rules for the given study programme. He/she is also obliged to solve one task which is focused on numerical analysis of the selected material crack.</i>					
<b>Learning outcomes of the course unit:</b> <i>In relation to mathematical theory, student is able to solve the specific tasks which are closely connected with elasticity, tensibility or flexibility. Furthermore, student can also create the models of cracks. Besides evaluation and diagnostics of fracture, he/she is familiar with crack initiation and propagation.</i>					
<b>Course contents:</b> <i>Fundamental terms and computer models of elasticity and strength. The specific tasks based on mathematical theory referring to tensibility, elasticity and flexibility – matrix formulation, tasks relating to plane elasticity in coordinates, finite difference method for 1-D, 2-D and 3-D harmonic and disharmonic systems. Exercises relating to utilisation of the finite difference method for partial differential equations regarding to parabolic and hyperbolic type. Explicit and implicit scheme or pattern and its utilisation during the solution of tasks for heat transfer. Basic or fundamental terms relating to fracture mechanics, classification of models representing cracks. Division of fracture mechanics. Linear elastic fracture mechanics and Elastic-plastic fracture mechanics. Fracture criteria. Conception of J-integral. Subcritical crack propagations. Prediction of the residual service lifetime.</i>					
<b>Recommended or required literature:</b> <i>RÚŽIČKA, M. - HANKE, M. - ROST, M.: Dynamická pevnost a životnost. ČVUT Praha, 1992</i> <i>TREBUŇA, F. - JURICA, V. - ŠIMČÁK, F.: Pružnosť a pevnosť II. VIENALA, Košice, 2000</i> <i>STRNADEL, B.: Řešené příklady a technické úlohy z materiálového inženýrství. Ostravské tiskárny, Ostrava, 1998</i> <i>SURESH, S.: Fatigue of Materials, Cambridge University Press. 1998</i> <i>SIRATORI - MIESI - MACUŠITA : Vyčísliateľná mechanika razrušenija. MIR, Moskva, 1986</i>					
<b>Language:</b> <i>Slovak language (the initial language of the educational process)</i>					
<b>Remarks:</b> —					
<b>Evaluation history: /Grading system/</b>					
A	B	C	D	E	FX
<i>Excellent</i>	<i>Laudable</i>	<i>Good</i>	<i>Accepted results</i>	<i>Pass</i>	<i>Fail</i>
<b>Lecturers:</b> <i>prof. Ing. Ján Vavro, PhD.</i>					
<b>Last modification:</b> <i>31.03.2014</i>					
<b>Supervisor:</b> <i>prof. Ing. Darina Ondrušová, PhD.</i>					