

Information sheet for the course Applied Mechanics

University: <i>Alexander Dubček University of Trenčín</i>	
Faculty: <i>Faculty of Industrial Technologies in Púchov</i>	
Course unit code: <i>M-PV-6</i>	Course unit title: <i>Applied Mechanics</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: 0</i>	
Number of credits: <i>8</i>	
Recommended semester: <i>the 2nd semester in the 1st year of the full-time form of study,</i> <i>the 2nd semester in the 1st year of the part-time form of study.</i>	
Degree of study: <i>the 3rd degree of study (PhD. degree)</i>	
Course prerequisites: <i>none</i>	
Assessment methods: <i>To accomplish the given study subject, PhD. students have to elaborate the project which has to be focused on numerical analysis or it has to be connected with experimental measurement of the solved problem in relation to the dissertation thesis. During the elaboration of the project, students are obliged to take into account the current state of the solved problem on the basis of the data obtained from the scientific literature and international scientific publications, papers. The project elaboration is closely connected with its subsequent introduction in the form of the presentation. The given presentation has to be performed at the presence of the pedagogue as well as class-colleagues. The given student has to answer the asked questions resulting from his/her work which was presented during the discussion. Student has to defence his/her presented project mentioned above in a successful way because it is one of the requirements referring to accomplishment of the subject. After the accomplishment of all Lecturers and seminars, which are held in the way of discussion between students and pedagogue, PhD. students are obliged to pass the test which is focused on numerical and experimental analysis and simulations or experimental analysis with the reference to the solved problem which differs from the aspect of the individual dissertation thesis. The successful accomplishment of the test is connected with the fact that student has to obtain 60% from the specified number of the points (the total number of the points referring to 100% is variable).</i>	
Learning outcomes of the course unit: <i>Student has improved his/her knowledge in relation to the experimental work as well as numerical analysis and simulations based on solution of the problems which are closely connected with the topic of the student's dissertation theme. Student is familiar with the various method principles regarding to the study and investigation of the mechanical, physical, chemical properties and any other characteristic parameters and features in relation to investigated materials because the mentioned characteristic parameters and features are used as the input parameter values for numerical analysis of the solved problem. Student is able to analyse and evaluate the solved problem and moreover, he/she can propose solutions for development and research of new kinds of materials as well as technological processes referring to production of these new kinds of materials.</i>	
Course contents: <i>Experimental determination of the input material parameters and critical or boundary or marginal conditions relating to the numerical solution of the problem with the reference to the topic of the dissertation thesis. Engineering applications of the numerical simulations. Creation of the models and modelling with help of finite element method (FEM). Linear static analysis including the fundamental types of finite elements. Linear dynamic analysis. Non-linear static analysis.</i>	

Recommended or required literature:

1. M. Žmindák, I. Grajciar, J. Nozdrovický: *Modelovanie a výpočty v metóde konečných prvkov*, ŽU v Žiline 2004, ISBN 80-968823-5-X.
2. J. Vavro, M. Kopecký, J. Vavro ml.: *Nové prostriedky a metódy riešenia sústav telies III*, TnUAD, FPT, 2007. - 150 s. - ISBN 978-80-8075-256-9.
3. Ján Vavro, Helena Hajska, Ján Vavro jr., Alena Vavrová: *Nové metódy a prístupy experimentálnej mechaniky pri identifikácii vád a porúch výrobkov*, I. vyd. - Krakow : Spolok Slovákov v Poľsku, 2011. - 264 s. - ISBN 978-83-7490-461-2.
4. *Scientific literature and international scientific publications referring to the topic of the dissertation thesis.*

Language: *Slovak***Remarks:** —**Evaluation history: /Grading system/**

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>

Lecturers: *prof. Ing. Ján Vavro, PhD.***Last modification:** *30.04.2014***Supervisor:** *prof. Ing. Darina Ondrušová, PhD.*