Information sheet for the course
Selected Chapters from Applied Mechanics

University: *Alexander Dubček University of Trenčín*	
Faculty: *Faculty of Industrial Technologies in Púchov*	
Course unit code: *M-PV-12*	**Course unit title:** *Selected Chapters from Applied Mechanics*
Type of course unit: *optional*	
Planned types, learning activities and teaching methods: *Teaching method:* - *face to face method.* *This subject represents one of the subjects relating to the final state exam.*	
Number of credits: *4*	
Recommended semester: - *the subject accomplishment – at least up to half of the time period determined for standard study of the full-time form of study,* - *the subject accomplishment – at least up to half of the time period determined for standard study of the part-time form of study.*	
Degree of study: *the 3rd degree of study (PhD. degree)*	
Course prerequisites: *All compulsory and optional subjects has to be successfully accomplished with the reference to the study plans where the given mentioned subjects are predetermined for the individual time periods described in doctoral study programme including M-PV-6 (Applied Mechanics). Moreover, all of the needed prerequisites have to be fulfilled and then the student is allowed to carry out the dissertation exam of the introduced subject.*	
Assessment methods: *To accomplish the given study subject, students have to show the creative work during the seminar lessons as well as creative approach during the solution of the determined or specified tasks. Student has to accomplish the dissertation exam in relation to this subject.*	
Learning outcomes of the course unit: *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. 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 while the mentioned facts are closely connected with the successful accomplishment of the dissertation exam because this subject is one of the subjects relating to the dissertation exam.*	
Course contents: *Engineering applications of the numerical simulations. The fundamental types of analyses in ADINA program. Basic equations relating to finite element method. Modelling procedures with help of finite element method. The selection of the appropriate and suitable elements. The critical or boundary or marginal conditions relating to the numerical solution of the problem. The proportions or the size of the mesh in relation to the first analyses. Determination of stress conditions. Linear static analysis including the fundamental types of finite elements. Bar constructions. Beam constructions. Shell constructions. Post-processing with reference to 3-D models. Linear dynamic analysis. Eigenfrequencies (natural vibration frequencies) and modal analysis. Damping process for the various systems. Non-linear static analysis. The sources of non-linearity. Geometric non-linearity. Materials non-linearity.*	
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 Hajská, Ján Vavro jr., Alena Vavrová: Nové metódy a prístupy experimentálnej mechaniky pri identifikácii vád a porúch výrobkov,1. vyd. - Krakow : Spolok Slovákov v Poľsku, 2011. - 264 s. - ISBN 978-83-7490-461-2.*
4. *Scientific literature and international scientific publications refering to the topic of the dissertation thesis.*

Language: *slovak*

Remarks: —

Evaluation history: /Grading system/

A	B	C	D	E	FX
Excellent	*Laudable*	*Good*	*Accepted results*	*Pass*	*Fail*

Lecturers: *prof. Ing. Ján Vavro, PhD.*

Last modification: *30.04.2014*

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