

ADMISSION TO DOCTORAL STUDIES

Session September 2024

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: prof. Silviu Butnariu

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Optimizing the structures of vehicle components in order to increase durability and resistance to fatigue*

Contents / Main aspects to be considered –

Study the fatigue behaviour and durability of critical automotive components under dynamic loading conditions, developing models to predict lifespan and optimize design for longer service life. Develop and apply optimization techniques to design lightweight automotive components with improved strength-to-weight ratios.

Recommended bibliography:

1. Hadryś, D., and M. Miros, Coefficient of restitution of model repaired car body parts. Journal of Achievements in Material and Manufacturing Engineering 28.1 (2008): 51-54.
2. Schuh, Benjamin, et al. Mechanical properties, microstructure and thermal stability of a nanocrystalline CoCrFeMnNi high-entropy alloy after severe plastic deformation. Acta Materialia 96 (2015): 258-268.
3. Lee, Erastus H. "Elastic-plastic deformation at finite strains." (1969): 1-6.
4. Butnariu, S., VR technologies for scanning, 3D reconstruction and tracking-lecture notes, CD, ISBN: 978-973-131-340-5, Ed. Lux Libris, 2016
5. Navodariu, Nicolae, et al. Effect of local heating on the mechanical characteristics of repaired automotive panels. Materiale Plastice 56.4 (2019): 750-758.
6. Chen, Chao, et al. "Research on the mechanical properties of repaired clinched joints with different forces." Thin-Walled Structures 152 (2020): 106752.
- Mori, Ken-ichiro, et al. "Joining by plastic deformation." CIRP Annals 62.2 (2013): 673-694
7. Butnariu, S., Mogan, Gh., Analiza cu elemente finite în ingineria mecanică.. Aplicatii practice in ANSYS, Ed. Universităţii Transilvania, ISBN 978-606-19-0474-7 (print), 2014

Prerequisites / Remarks:

Graduates of the Automotive Engineering, Mechanical Engineering, Medical Engineering, Mechatronics, Robotics, Electrical Engineering study programs; Programming knowledge

Scientific Doctorate (full-time only)

Professional Doctorate – in the fields of Music and Science of sport and physical education (full-time or part-time)

without tuition fee (state budget funded)

with tuition fee or with funding from other sources than the state budget

Doctoral supervisor,

Prof. Dr. eng. Silviu BUTNARIU

Signature

Coordinator of the field of doctoral studies,

Prof. Dr. Eng. Sorin VLASE

Signature