



## ADMISSION TO DOCTORAL STUDIES

Session September 2026

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: Prof. dr. eng. Simona Lache

### TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

#### TOPIC 1: Multi-stable cellular structures

##### Contents / Main aspects to be considered

The development of cellular structures that can go through several states of equilibrium, respectively can go from one geometric shape to another under the action of external stimuli (mechanical, thermal, acoustic or electro-magnetic stresses).

##### Recommended bibliography:

1. Yong Zhang, Qi Wang, Marcel Tichem, Fred van Keulen, 2020, Design and characterization of multi-stable mechanical metastructures with level and tilted stable configurations, Extreme Mechanics Letters, Volume 34, January 2020, Elsevier, <https://doi.org/10.1016/j.eml.2019.100593>.
2. Xiao Ju, Shaoqi Li, Yu Zhang, Penghao Wu, Yancheng Li, 2024, Design of multi-stable metamaterial cell with improved and programmable energy trapping ability based on frame reinforced curved beams, Thin-Walled Structures, Volume 202, September 2024, Elsevier <https://doi.org/10.1016/j.tws.2024.112120>.
3. Xiaojun Tan, Bing Wang, Kaili Yao, Shaowei Zhu, Shuai Chen, Peifei Xu, Lianchao Wang, Yuguo Sun, 2019, Novel multi-stable mechanical metamaterials for trapping energy through shear deformation, International Journal of Mechanical Sciences, Volume 164, <https://doi.org/10.1016/j.ijmecsci.2019.105168>.
4. David Restrepo, Nilesh D. Mankame, Pablo D. Zavattieri, 2015, Phase transforming cellular materials, Extreme Mechanics Letters, Volume 4, September 2015, Pages 52-60, Elsevier, <https://doi.org/10.1016/j.eml.2015.08.001>.

Scientific Doctorate

Professional Doctorate

without tuition fee (state budget funded)

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

Doctoral supervisor,  
Prof. dr. ing. Simona LACHE

Coordinator of the field of doctoral studies,  
Prof. dr. ing. Maria Luminița SCUTARU