Transilvania University of Brașov
INTERDISCIPLINARY DOCTORAL SCHOOL

ADMISSION TO DOCTORAL STUDIES **Session September 2026**

Field of doctoral studies: Industrial engineering
Doctoral supervisor: Prof. Dr. Eng. Pascu Alexandru

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Laser processing of high - entropy materials*
Contents / Main aspects to be considered Current state of the art in high entropy material manufacturing technologies Laser processing technology for high entropy materials Experimental investigations on the welding of high entropy materials
Recommended bibliography: 1. Pascu Alexandru, Recondiționarea cu laser: baze teoretice și aplicații industriale, Editura Printech București , ISBN 978-606-23-0689-2, 2016. 2. Adeh Amiri, Reza Shahbazian-Yassar Messler, Recent progress of high-entropy materials for energy storage and conversion, J. Mater. Chem. A, 2021, 9,782. 3. Messler, R.W., Principles of Welding: Processes, Physics, Chemistry, and Metallurgy. John Wiley & Sons, ISBN: 978-471-25376-1, 2008. 4. John C. Ion, Laser Processing of Engineering Materials, Elsevier Butterworth-Heinemann, ISBN: 0 7506 6079 1, 2005.
Prerequisites / Remarks: **Bachelor's and Master's studies in the field of Industrial Engineering represent an advantage for the candidate(s).**
☐x Scientific Doctorate **☐x Professional Doctorate**
☐x without tuition fee (state budget funded) **☐x with tuition fee or with funding from other sources than the state budget**

TOPIC 2: *Precise dilution control in laser cladding using metallic powders*
Contents / Main aspects to be considered Current state of the art in laser and powder deposition technologies Evaluation and optimization of laser cladding parameters using analytical methods Experimental study on determining the optimal parameters of the laser cladding process Experimental research on the spectral analysis of the plasma generated during laser cladding

Recommended bibliography:

1. Stanciu Elena Manuela, Pascu Alexandru, Sudarea cu laser, Editura LuxLibris Brașov, ISBN 978-973-131-304-4, 2014.
2. Pascu Alexandru, Recondiționarea cu laser: baze teoretice și aplicații industriale, Editura Printech București , ISBN 978-606-23-0689-2, 2016.
3. John C. Ion, Laser Processing of Engineering Materials, Elsevier Butterworth-Heinemann, ISBN: 0 7506 6079 1, 2005.

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Doctoral supervisor,

Prof. Dr. Eng. Pascu Alexandru

Signature

Coordinator of the field of doctoral studies,

Prof. dr. ing. Gheorghe OANCEA

Signature