Transilvania University of Brașov
INTERDISCIPLINARY DOCTORAL SCHOOL

ADMISSION TO DOCTORAL STUDIES **Session September 2025**

Field of doctoral studies: Materials Engineering

Doctoral supervisor: Prof. Dr. Eng. Dan CRISTEA

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Wear resistant coatings for low lubrication conditions*
Contents / Main aspects to be considered - *Development and characterization of nitride coatings of a transition metal (MeN), doped with carbon, with improved mechanical and antifriction properties.*
Recommended bibliography: 1. Manish Roy - Surface Engineering for Enhanced Performance against Wear - Springer, 2013 2. J.R. Davis - Surface Engineering For Corrosion And Wear Resistance– ASM International, 2001 3. Burakowski, T – Surface engineering of metals: principles, equipment, technologies – CRC Press, 1999 4. Ohring, M. The materials science of thin films. Academic Press, 1992
Prerequisites / Remarks: *Knowledge of physics and materials science.*
☒ **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**

TOPIC 2: *High entropy thin solid films*
Contents / Main aspects to be considered - *Development and characterization of HEA coatings, with improved mechanical properties.*
Recommended bibliography: 1. Manish Roy - Surface Engineering for Enhanced Performance against Wear - Springer, 2013 2. J.R. Davis - Surface Engineering For Corrosion And Wear Resistance– ASM International, 2001 3. Burakowski, T – Surface engineering of metals: principles, equipment, technologies – CRC Press, 1999 4. Ohring, M. The materials science of thin films. Academic Press, 1992
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TOPIC 3: *Yttrium doped tin oxide thin films for optoelectronic and environmental applications*
Content / Main aspects to be considered - *Development and characterization of tin oxide-based films with various dopants (Me:SnO), for optoelectronic and environmental applications.*
Recommended bibliography: 1. Daniel Abou-Ras, Thomas Kirchartz, and Uwe Rau- Advanced Characterization Techniques for Thin Film Solar Cells- 2016 Wiley-VCH 2. Ohring, M. The materials science of thin films. Academic Press, 1992
Prerequisites / Remarks: *Knowledge of physics and materials science*

Doctoral supervisor,

Prof. Dr. Eng. Dan CRISTEA

Signature

Coordinator of the field of doctoral studies,

Prof. Dr. Eng. Mircea Horia TIEREAN

Signature