



ADMISSION TO DOCTORAL STUDIES

Session September 2022

Field of doctoral studies: Materials Engineering

Doctoral supervisor: Professor dr. eng. Daniel Munteanu

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Multifunctional coatings with different structural architectures, obtained by Physical Vapour Deposition – reactive magnetron sputtering technique.*

Content / Main aspects to be considered - *to be adapted/ completed/ deleted*

- Classification of vacuum deposition processes for obtaining coatings and thin-films;
- The fundamentals of magnetron – sputtering system;
- Hard coatings deposition by reactive magnetron sputtering; obtaining normal and zig-zag structural architectures;
- Physical, chemical and structural characterization;
- Mechanical and tribological characterization.

Recommended bibliography:

1. Iliuc, I., Tribologia straturilor subtiri, Ed. Academiei Romane, 1974.
2. Munteanu, D., Straturi subtiri, cu rol tribologic, obtinute prin depunere chimica din vapori activata in plasma, Ed. Universitatii Transilvania din Brasov, 2003.
3. Ionescu, C., Munteanu, A., Munteanu, D., Straturi dure de tip Ti-Si-C, obtinute la temperaturi joase, prin depunere fizica din vapori, Ed. Universitatii Transilvania din Brasov, 2009.
4. Popescu, N., Gheorghe, C., Popescu, O., Tratamente termice neconventionale, Ed. Tehnica, Bucuresti, 1990.
5. Popescu, I., Iova, I., Fizica plamei si aplicatii, Ed. Tehnica, Bucuresti, 1981.
6. Mitsuharu, K., Film deposition by plasma techniques, Springer, 1992.
7. Mattox, D.M., Handbook of Physical Vapour Deposition (PVD) Processing, Second edition, Elsevier (ScienceDirect) 2010.
8. P.J. Kelly, R.D. Arnell, Magnetron sputtering: a review of recent developments and applications, Voil. 56, 3, March 2000, Pages 159-172.

Prerequisites / Remarks: *to be adapted/ completed/ deleted*

Doctoral supervisor,

Prof. dr. eng. Daniel MUNTEANU

Signature



Coordinator of the field of doctoral studies,

Prof. dr. eng. Mircea Horia TIREEAN

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