



ADMISSION TO DOCTORAL STUDIES

Session September 2024

Field of doctoral studies: Materials Engineering

Doctoral supervisor: Professor dr. eng. Daniel Munteanu

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: <i>Thin-films with different structural architectures, obtained by Physical Vapour Deposition – reactive magnetron sputtering technique.</i>
Content / Main aspects to be considered - <i>to be adapted/ completed/ deleted</i> <ul style="list-style-type: none"><li>- Classification of vacuum deposition processes for obtaining coatings and thin-films;</li><li>- The fundamentals of magnetron – sputtering system;</li><li>- Hard coatings deposition by reactive magnetron sputtering; obtaining normal and zig-zag structural architectures;</li><li>- Physical, chemical and structural characterization;</li><li>- Mechanical and tribological characterization.</li></ul>
Recommended bibliography: <ol style="list-style-type: none"><li>1. Iliuc, I., Tribologia straturilor subtiri, Ed. Academiei Romane, 1974.</li><li>2. Randhawa, H., Review of plasma-assisted deposition processes, Thin Solid films, Vol. 196, Issue 2, pp. 329 – 349, 1991.</li><li>3. Munteanu, D., Straturi subtiri, cu rol tribologic, obtinute prin depunere chimica din vapori activata in plasma, Ed. Universitatii Transilvania din Brasov, 2003.</li><li>4. 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.</li><li>5. Popescu, N., Gheorghe, C., Popescu, O., Tratamente termice neconventionale, Ed. Tehnica, Bucuresti, 1990.</li><li>6. Popescu, I., Iova, I., Fizica plasmei si aplicatii, Ed. Tehnica, Bucuresti, 1981.</li><li>7. Mitsuharu, K., Film deposition by plasma techniques, Springer, 1992.</li><li>8. Mattox, D.M., Handbook of Physical Vapour Deposition (PVD) Processing, Second edition, Elsevier (ScienceDirect) 2010.</li><li>9. P.J. Kelly, R.D. Arnell, Magnetron sputtering: a review of recent developments and applications, Voil. 56, 3, March 2000, Pages 159-172.</li></ol>
Prerequisites / Remarks: <i>to be adapted/ completed/ deleted</i>

Doctoral supervisor,

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