



PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 39th cycle

THEMATIC Research Field: ADVANCED COATINGS AND ALLOYS

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

Innovative research in mechanical engineering today is increasingly focused on the study of advanced engineered materials, which combine functional and bulk properties and on the control of surface conditions. The final performance of the component is provided by materials that must combine different, sometimes opposed, properties derived from chemical composition, morphology and manufacturing process; however, it must be taken into account that the interaction with the stimuli from the environment around, mainly originates from the surface, and from it often result degradation phenomena. Moreover, an optimization of surface conditions is a key factor to addressing the ever-increasing environmental requests from industry and global society.

Methods and techniques that will be developed and used to carry out the research

Production techniques from powder or casting will be used on a laboratory scale, with emphasis on the possibility of combining different materials (metal/metal, or metal/ceramic). Simulation analysis will also guide the materials selection. Moreover the research will involve, optical and electron microscopy, EBSD, XRD, DSC, and mechanical characterization by wear test, tensile testing, fracture toughness, fatigue testing. For more details about infrastructures, see:
<https://www.mecc.polimi.it/us/research/departamental-laboratories/>.

Educational objectives

At the end of the PhD cycle the candidate will be able to



	define, design and carry out original research programs by working in a team or leading a research group in the field of coating and composite materials.
Job opportunities	All project activities are strongly connected to industrial needs and industrial partners are directly participating to project tasks. Our last survey on MeccPhD Doctorates highlighted a 100% employment rate within the first year and a 35% higher salary , compared to Master of Science holders in the same field.
Composition of the research group	1 Full Professors 2 Associated Professors 0 Assistant Professors 5 PhD Students
Name of the research directors	Prof. Maurizio Vedani, Prof. Nora Lecis

Contacts
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For questions about scholarship/support phd-dmec@polimi.it

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
<p>Financial aid is available for all PhD candidates (purchase of study books and materials, funding for participation in courses, summer schools, workshops and conferences) for a total amount of euro 5.707,13.</p> <p>Our candidates are strongly encouraged to spend a research period abroad, joining high-level research groups in the specific PhD research topic, selected in agreement with the Supervisor. An increase in the scholarship will be applied for periods up to 6 months (approx. 700 euro/month-net amount).</p>



Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD candidate. There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.