POLITECNICO DI MILANO

PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 38th cycle

Research Area n. 1 - Advanced Materials and Smart Structures

THEMATIC Research Field: MODELLING AND TESTING COMPOSITE MATERIALS AND STRUCTURES FOR LIGHTWEIGHT DESIGN AND STRUCTURAL INTEGRITY ASSESSMENT

Monthly net income of PhDscholarship (max 36 months)
€ 1325.0 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	Working in the Machine and vehicle design group requires motivation in developing experimental and computational methods for the assessment of the structural integrity and advanced design of mechanical components and vehicles. The objectives of the research may range from the definition of new models of materials behaviour to the assessment of the structural integrity of large structures, from the experimental investigation on new materials to the design of components or vehicles with innovative features, with special focus on lightweight design. This research activity will focus on: composite materials and structures, including additively manufactured ones; joining techniques for lightweight design; sensors for composites structure; structural health monitoring and prognosis; Digital Twin for structural integrity purposes; low and high velocity impact on composite material; new experimental methods.
Methods and techniques that will be developed and used to carry out the research	Depending on the specific research topic assigned, methods and techniques will comprise Finite element modelling, Boundary element modelling, Fracture mechanics, multi-axial fatigue tests on specimens or on parts, non-destructive tests, high temperature tests, residual stress tests, tests on vehicle components, tests on gears, tests on power transmission, driving simulator

	tests.
Educational objectives	The Doctor in Mechanical Engineering will be able to define, start and carry out original research by working in a team or leading a research group. Both theoretical and experimental skills are mastered.
Job opportunities	Job opportunities related to the research activity include structures/organizations aimed at innovation and/or research and technical development (i.e. CNR), high-tech SMEs, government departments ruling on public needs (i.e. INAIL). Our last survey on MeccPhD Doctorates highlighted a 100% employment rate within the first year and a 35% higher salary, compared Master of Science holders in the same field.
Composition of the research group	0 Full Professors 2 Associated Professors 0 Assistant Professors 6 PhD Students
Name of the research directors	Prof. Andrea Bernasconi

Contacts
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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	662.5 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Financial aid is available for all PhD candidates (purchase of study books and materials, fundingfor participation in courses, summer schools, workshops and conferences) for a total amount of euro 5.401,42.

Our candidates are strongly encouraged to spend a research period abroad, joining high-levelresearch 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. 662,50 euro/month- net amount).

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.