ARC Training Centre for Automated Manufacture of Advanced Composites
Design, Integration and Optimization Research Program

The Australian Research Council (ARC) Training Centre for Automated Manufacture of Advanced Composites (AMAC) will develop the next generation of industry-focused innovators and researchers in the field of advanced composites manufacturing for industry. The Centre is administered at UNSW Sydney in collaboration with Australian National University (ANU), Canberra and the Technical University of Munich (TUM), Germany. The Centre also involves several industry partners representing several high-performance industry sectors, including defence, aerospace, automotive and elite sport. The main aims of the Centre are to:

• Provide industry-focused research training to a generation of composite manufacturing innovators
• Promote integrated innovation in composites manufacture, from material design to product realisation
• Incorporate key Australian composites innovations into the automated manufacturing process chain
• Foster strong collaborations between Australian universities and a host of global organisations and
• Enhance Australia's R&D capability in the field of advanced composite manufacturing.

The Centre is seeking applicants for a PhD on ***Penetration resistance into hybrid metal-composite structures***, as detailed below, to be based at UNSW Canberra. A tax-free scholarship of AU$31,298 is available to successful candidates for 3 years, with a possible 6-month extension. It is a condition of the scholarship that the successful applicant accumulates 1-year of industry-based research training with one or more of the AMAC industry partners during their candidature.

PhD Project Title
Penetration resistance into hybrid metal-composite structures

Project Background and Description

Hybrid metal laminate composites comprise of a metallic layer with a fibrous composite structure directly attached to the metal. These structures have the potential to offer improved impact resistance performance and damage tolerance over and above single-layer metal plates by controlling the rate of deformation. The project will comprise of both computational and experimental work and will probe the role of the composite layer in controlling the deformation of the metallic front-face. This will have applications in developing crash-resistant and enhanced blast-resistant structures. The student will be expected to undertake the following tasks:

- Develop a metal-hybrid system using established approaches
- Develop FE models to evaluate the stress response of the composite layer during dynamic indentation
- Evaluate the failure mechanisms that occur during dynamic indentation using FE approaches and experimentation
- Develop a path to optimise structure design.

PhD Candidate Selection Criteria

• Bachelor (Honours) or Master degree in Mechanical, Materials or Manufacturing Engineering; at 1st class or upper second class level, or equivalent
• Demonstrated research capability (e.g. through thesis work) in the area of fibre composite materials
• Evidence of industry experience relevant to the proposed field of study
• Demonstrated ability to create impact for industry partners
• Highly developed design, analysis, experimental and modelling skills for composite materials
• Highly developed interpersonal, communication and management skills

Application Process

Applications should be submitted to Professor Paul Hazell. The application should consist of a CV, a statement addressing the selection criteria, a transcripts, graduation certificates and testamurs of previous tertiary study. Three referees must also be nominated. All applicants are encouraged to use the HDR Self-Assessment Tool https://selfassessment.research.unsw.edu.au/ to help give an indication of your eligibility and competitiveness for a scholarship (please attach a screenshot of the outcome in your application).

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