

Probabilistic Approaches to Engineering Critical Assessment

Type of award PhD Research Studentship

Department Mechanical Engineering

Scholarship Details £18,000 p.a. subject to confirmation and meeting eligibility criteria.

Duration 3.5 years

Eligibility Home/EU

Start Date March 2021

PhD Topic Background/Description

Engineering analysis methods that can predict and prevent the failure of safety-critical structures are fundamentally important to the energy industry. Nuclear reactors, wind turbines and oil platforms all need to be provably safe in the face of severe and complex loading scenarios. Recently, new structural integrity assessment methods based on Probabilistic Fracture Mechanics (PFM) have emerged in the nuclear energy industry. PFM allows engineers to understand the sources of risk to a structure better, and to predict more realistically what its response will be under uncertain loading conditions.

This project will focus on developing PFM-based methods so that they can be confidently used to assess a wider range of energy structures: particularly those where less restrictive risk profiles are acceptable. For example, in an offshore wind turbine, which is an un-crewed structure with a relatively short design life, a different risk profile is appropriate to that of a nuclear power reactor. You will investigate the limits of probabilistic structural integrity assessment and the interplay between assessment and measurement methods including Ultrasonic Non-Destructive Testing (UNDT) and residual stress measurement.

You will work at the National Structural Integrity Research Centre (NSIRC) in Cambridgeshire and the University of Bristol. The new probabilistic understanding of structural failure that you will develop will inform the UK standard BS 7910 and specialised nuclear-specific structural assessment codes, providing a safer and more rational underpinning for the next generation of energy infrastructure.

Further Particulars

Candidate Requirements

You should hold/achieve a minimum of a master's degree (or international equivalent) in a relevant discipline such as Engineering or Data Science. Applicants without a master's qualification may be considered on an exceptional basis, provided they hold a first-class undergraduate degree. Overseas applicants must satisfy the University of Bristol's Profile E language category

(www.bristol.ac.uk/study/language-requirements/profile-e/), equivalent to an IELTS score of 6.5 with at least 6.0 in all categories.

Basic skills and knowledge required:

Essential: knowledge or experience of engineering stress analysis, and experience with statistical data analysis and/or scientific coding.

Desirable: Experience of engineering structural integrity or fitness-for-service assessment would be an advantage.

Informal enquiries

For questions about the **research** topic please contact Dr Harry Coules at harry.coules@bristol.ac.uk

For questions about **eligibility and the application** process please contact CAME Postgraduate Research Admissions came-pgr-admissions@bristol.ac.uk

Application Details

To apply for this studentship submit a PhD application using our [online application system](#)
[www.bristol.ac.uk/pg-howtoapply]

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Mechanical Engineering Department” and specify the title of the scholarship in the “other” box below along with the name of the supervisor. Interested candidates should apply as soon as possible.

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