Information on Postgraduate Research Scholarship
Ref: FS-ES-04-2027-2

Faculty:	Engineering & Science	**School:**	Engineering
Lead Supervisor:	Dr Ayse Cagla Balaban		
Project Title:	Data-Driven Structural Health Monitoring of Prestressed Bridge Girders Using Acoustic Emission and Finite Element Modelling		
Project Description:	Bridges are essential components of transport infrastructure, yet ageing, repeated loading and progressive structural deterioration can compromise their integrity. Detecting damage early and understanding how it develops are critical to improving infrastructure safety, extending service life and supporting effective maintenance decisions. This PhD project offers an opportunity to contribute to the development of intelligent structural health monitoring (SHM) methods by combining **acoustic emission (AE) monitoring, finite element (FE) modelling** and **data-driven techniques** to investigate damage initiation and progression in prestressed concrete bridge girders. The successful candidate will work with existing experimental datasets comprising mechanical response and AE measurements from bridge girders subjected to bending. The research will investigate relationships between structural behaviour, damage evolution and AE characteristics, develop and validate nonlinear FE models, and integrate experimental and numerical information using appropriate data-driven methods to improve damage identification and severity assessment. The project will involve: • Analysing experimental mechanical response and AE data to characterise progressive structural damage. • Developing and validating nonlinear FE models of prestressed concrete bridge girders under bending. • Investigating AE signal characteristics associated with damage initiation, progression and severity. • Applying data-driven techniques to integrate experimental measurements and numerical predictions. • Developing and validating an integrated framework for structural condition assessment. **International research and industrial collaboration:** The project builds on established international research collaborations involving the University of Greenwich and leading academic institutions in Italy, bringing together complementary expertise in structural engineering, experimental mechanics, numerical modelling and acoustic emission-based structural health monitoring. The research will also benefit from engagement with industrial partners, providing access to specialist technical expertise, relevant experimental datasets and practical perspectives on infrastructure monitoring. These collaborations will support the development and validation of the proposed methodologies and strengthen their applicability to real-world structural engineering challenges.		

	Research training and career development The successful candidate will develop interdisciplinary expertise in experimental structural engineering, acoustic emission, computational modelling and data-driven analysis. The project offers opportunities for international collaboration, research publications and engagement with industrial practice, providing a strong foundation for careers in academic research, structural engineering, infrastructure monitoring and related industries. Ultimately, the research aims to advance the reliability of structural damage assessment and contribute to safer, more resilient and sustainably managed bridge infrastructure through improved inspection, maintenance and long-term asset management. **This scholarship is awarded competitively, and all applications are carefully reviewed. While we cannot guarantee an offer, we encourage strong candidates to apply.**
Duration:	3 years, full-time study 6 years, part-time study

Support available (subject to satisfactory performance):

For Home students

- A full tuition fee waiver at the Home student rate for the duration of the scholarship.

For International students

- 50% tuition fee waiver against the International student rate for the duration of the scholarship.

Important information

- Tuition fees are subject to annual review and may increase during the course of study.
- This scholarship covers tuition fees only and does not include funding for living, accommodation, or maintenance costs.

Person Specification of Essential (E) or Desirable (D) requirements:

Criteria:	**E or D**
Education and Training:	
• 1st Class or 2nd class, First Division (Upper Second Class) honours degree or a taught master's degree with a minimum average of 60% in all areas of assessment (UK or UK equivalent) in a relevant area to the proposed research project	**E**
• For those whose first language is not English and/or if from a country where English is not the majority spoken language (as recognised by the UKBA), a language proficiency score of at least IELTS 6.5 (in all elements of the test) or an equivalent UK VISA and Immigration secure English Language Test is required, if your programme falls within the faculty of Engineering and Science a language proficiency score of at least IELTS 6.5 overall with a minimum of 6.0 in all elements of the test or an equivalent UK VISA and Immigration secure English Language Test is required. Unless the degree above was taught in English **and** obtained in a majority English speaking country, e.g. UK, USA, Australia, New Zealand, etc, as recognised by the UKBA.	**E**

Experience & Skills:	
• Previous experience of undertaking research (e.g. undergraduate or taught master's dissertation)	**E**
• A sound understanding of structural engineering principles, structural behaviour and mechanics of materials.	**E**
• Ability to analyse and interpret experimental or numerical data and communicate technical findings effectively.	**E**
• Experience or knowledge of finite element modelling and structural analysis using relevant computational tools.	**D**
• Familiarity with structural health monitoring, non-destructive testing or acoustic emission techniques.	**D**
• Experience in programming, numerical analysis or data-driven methods (e.g. Python, MATLAB or machine learning).	**D**
Personal Attributes:	
• Understands the fundamental differences between a taught degree and a research degree in terms of approach and personal discipline/motivation	**E**
• Able to, under guidance, complete independent work successfully	**E**
• Demonstrates strong analytical thinking, problem-solving skills and intellectual curiosity.	**E**
• Able to communicate research findings effectively, both verbally and in writing.	**E**
• Demonstrates an interest in interdisciplinary research and a willingness to develop new experimental, computational and data-analysis skills.	**D**
• Able to work collaboratively within an international and multidisciplinary research environment.	**D**
Other Requirements:	
• This scholarship may require Academic Technology Approval Scheme approval for the successful candidate if from outside of the EU/EEA	**E**
• The scholarship must commence before 5th April 2027	**E**
Closing date for applications:	**Midnight UTC on 30th November 2026**
For further information contact:	**Dr Ayse Cagla Balaban** **ayse.balaban@greenwich.ac.uk**

Making an application:

Please read this information before making an application. Information on the application process is available at: https://www.gre.ac.uk/research/study/apply/application-process. Applications need to be made online via this link. **No other form of application will be considered**.

All applications **must include** the following information. **Applications not containing these documents will not be considered.**

- **Scholarship Reference Number (FS-ES-04-2027-2)**– included in the personal statement section together with your personal statement as to why you are applying
- **a CV including 2 referees** *
- **academic qualification certificates/transcripts and IELTs/English Language certificate if you are an international applicant, if English is not your first language or you are from a country where English is not the majority spoken language as defined by the UK Border Agency** *

**upload to the qualification section of the application form. Attachments must be a PDF format.*

Before submitting your application, you are encouraged to liaise with the Lead Supervisor on the details above.