

Title: Multi-scale Laboratory and Numerical Investigation of Offshore Pile Foundations under Operational and Extreme Loading

Type of award PhD Research Studentship

Department Civil Engineering

Earthquake and Geotechnical Engineering Research Group

*Scholarship
Details*

Minimum £16,062 p.a. in 2022/23 subject to eligibility and award

Duration 3.5 years

Eligibility Home/EU (UK settled status) with permanent UK residency

Start Date From Sept 2022

PhD Topic Background/Description

Offshore wind energy plays a key role in advancing UK's Net Zero CO₂ roadmap and tackling global energy crisis. Foundation system supporting or anchoring wind turbines are evolving to meet the critical needs for harnessing wind energy in deeper waters, difficult grounds, and seismic areas. This PhD project aims at optimising the design of offshore pile foundations under operational and extreme (storm, earthquake) loading by employing a multi-scale experimental and numerical approach to: (i) investigate how sands and transitional soils respond to monotonic, cyclic and dynamic loading considering variable loading rates and partial drainage conditions through laboratory testing; (ii) further develop available soil models to capture non-uniform cyclic loading behaviour and enable coupled hydro-mechanical 3D FE simulation; (iii) understand soil-structure interaction mechanisms under complex loading scenarios through benchmarking large-scale pile tests in heavily instrumented grounds.

The project capitalises on the supervision team's expertise in advanced laboratory/field testing and numerical modelling. The successful applicant will benefit by working in close collaboration with vibrant research projects at the newly established UKCRIC Soil-Foundation-Structure Interaction (SoFSI) Laboratory and other ongoing projects such as the ESPRC-SFI ROBOCONE project that develops a new site investigation tool for offshore geotechnics. The University of Bristol further offers development schemes that train competent PhD candidates to undertake hourly-paid graduate teacher roles and pursue Higher Education Academy Fellowships.

Candidate Requirements

The candidate must have a first class, or a strong upper second class, honours degree in civil, mechanical, or relevant subjects, as well as excellent written and spoken communication skills. Recent graduates and those with relevant industry experience are welcome. Please note, acceptance will also depend on evidence of readiness to pursue a research degree.

If English is not your first language, you need to meet this profile level:

Profile E

Further information about [English language requirements and profile levels](#).

Basic skills and knowledge required

Experience in soil element testing, instrumentation, constitutive modelling and/or physical modelling is desirable but not essential.

Scholarship Details

Candidates are recommended to apply for the CAME EPSRC Doctoral Training Partnership (DTP) Scholarship. The selection process is competition-based across the School and this project is granted priority.

The DTP scholarship is open to UK students and EU applicants who have been resident in the UK for at least 3 years and have UK settlement or pre-settlement status under the EU Settlement Scheme. The scholarship covers tuition fees at home rate, tax free stipend (£16,062 pa for 2022/23) and travel/consumables budget of in total £4,900 for 3.5 years. The successful candidate is expected to enrol before 31st March 2023.

For eligibility and residence requirements please check the [UKRI UK Research and Innovation](#) website.

Enquiries

General enquiries, please email came-pgr-admissions@bristol.ac.uk

Informal enquiries, please email Dr Tingfa Liu (tingfa.liu@bristol.ac.uk) and Dr Andrea Diambra (Andrea.Diambra@bristol.ac.uk)

Application Details

Applicants are encouraged to contact the supervision team (noted above) prior to application.

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 **Civil Engineering** Department” and specify the title of the scholarship in the “other” box below with the names of the supervisors.

Interested candidates should apply as soon as possible. Applications will remain open until the position is filled.