

## Postgraduate Scholarship Information Sheet (Advert)

<b>Scholarship Project Title</b>	Nano-engineered graphene/cement-based concrete for multifunctional, low-carbon smart infrastructure
<b>Advert Reference number</b>	<b>SETU_2024_216</b>
<b>Supervisor(s)</b>	Dr. Raja Das SETU, Waterford Dr. Ramesh Raghavendra SETU, Waterford Dr. Ken Thomas SETU, Waterford
<b>Research Group</b>	SEAM Research Centre
<b>Department /School/Faculty</b>	School of Engineering
<b>Duration</b>	4 Years/48 Months
<b>Status: Full-time / part-time</b>	Full Time
<b>Funding information</b>	SETU 2024 Presidents Scholarship Programme
<b>Value of the scholarship per year for four years</b>	Stipend: €18,500 per annum Fees of €5,750 per annum Research costs: €3,000 per annum
<b>Closing date and time</b>	<b>Wednesday 14<sup>th</sup> August at 4pm Irish time</b>
<b>Interview date</b>	<b>To be confirmed</b>
<b>PhD commencement date</b>	<b>To be confirmed</b>
<p><b>Project Key Words: (enter 3 to help advertise on online platforms)</b> Low carbon, green concrete, graphene, nano-engineered</p> <p><b>Post summary</b></p> <p>Applications are invited for a fully funded 4-year SETU PhD scholarship programme in green concrete field to develop a low carbon graphene/cement-based concrete with superior mechanical strength and excellent durability. The project will be carried out in South East Applied Materials (SEAM) Research Centre, Department of Engineering Technology, SETU Waterford Campus, Ireland.</p> <p><b>Project summary</b></p> <p>The Climate Action Plan commits Ireland to a legally binding target of net-zero emissions no later than 2050, and a reduction of 51% by 2030. Cement industry is facing tremendous challenges of increasing costs of energy supplies, and CO<sub>2</sub> emission reduction requirements. Cement-based composites are the most popular construction materials, owing to their low-cost manufacture, easy shape-ability, and excellent compressive strength. Different additives have been proposed to improve the properties of cementitious composites, however, these additives were unable to improve properties due to limitations in bonding and arresting micro cracks. The use of graphene admixtures can increase strength, reduce materials usage (reduce carbon footprint) and potentially increase the longevity of products.</p> <p>This project aims to develop a graphene/cement-based composite with superior mechanical strength that would reduce clinker usage. The study will lead to the development of a multifunctional new generation nano-engineered concrete for making smart structural health monitoring civil infrastructure with integrated digital insights.</p>	

## Knowledge & Experience

### Essential

- Honours degree (minimum 2:1) in physics, materials sciences, chemistry, chemical sciences, engineering or other equivalent field.
- Must be available to commence PhD programme on or before 1st May 2025.

### Desirable

- Some knowledge on cement and concrete based materials.
- Have experience in working on research projects.
- Have understanding of material characterization techniques.
- Strong analytical and problem solving skills.

## Skills & Competencies

### Essential

- Applicants whose first language is not English must demonstrate on application that they meet [SETU's English language requirements](#) and provide all necessary documentation. See Page 7 of the Code of Practice
- In order to be **shortlisted for interview**, you must meet the SETU English speaking requirements so please provide evidence in your application.

### Desirable

- Excellent written and verbal communication skills.
- Ability to work both as a team member and as an independent researcher.
- An ability to learn laboratory equipment.

## Further information

For any informal queries, please contact Dr Raja Das on email [Raja.Das@setu.ie](mailto:Raja.Das@setu.ie)

For queries relating to the application and admission process, please contact the Postgraduate Admissions Office [researchadmissions@setu.ie](mailto:researchadmissions@setu.ie) or telephone +353 (0)51 302883.

For queries relating to the funding programme, please email [scholarships2024@setu.ie](mailto:scholarships2024@setu.ie)

University Website <https://www.setu.ie/>

## Application procedure

Download the Research Postgraduate Application Form from the SETU website and return the completed application to [researchadmissions@setu.ie](mailto:researchadmissions@setu.ie) quoting **SETU\_2024\_216** in the email subject line.

**Please note that paper submissions will not be accepted.**

**The University may decide to interview only those applicants who appear from the information they provided, to be the most suitable in terms of experience, qualifications and other requirements of the post.**

**The University will short-list and interview those applicants who provide the most suitable**

**information in terms of experience, qualifications and other requirements relevant to the scholarship.**

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