

## Job Description

| Lecturer in Digital Engineering for Fusion Energy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                |
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| <b>Grade</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Lecturer</b> - Grade 7 - £47,389 – £58,225 (depending on relevant experience)                               |
| <b>Department</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Faculty of Science and Engineering, School of Engineering, Department of Mechanical and Aerospace Engineering. |
| Overall Purpose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                |
| <p>The role-holder will drive forward research and teaching in digital engineering for fusion energy, developing and delivering the computational tools needed to meet the formidable engineering challenges this exciting field will face over the coming decades.</p> <p>We are looking for exceptional candidates with engineering expertise in one or more areas spanning the multiphysics modelling and simulation of fusion in-vessel components, with particular focus on structural integrity, through to the digital twins, high-performance computing, AI/machine learning and VV&amp;UQ methods that will underpin fusion design, safety and licensing.</p> <p>The successful candidate will work collaboratively across the University's established strengths in computational engineering, solid and structure mechanics, nuclear thermal-hydraulics, materials and advanced manufacturing, while also leveraging our strategic partnerships with the fusion sector – including UKAEA, UK Fusion Energy and their industrial supply chain.</p> <p>Through this, they will play a pivotal role in shaping fusion engineering innovation at Manchester in the years to come, advancing world-leading research, strengthening interdisciplinary capability, and ensuring that our graduates are equipped with the skills and insight to lead in a demanding area of high international importance.</p> <p>This is a teaching and research position and so the appointee is expected to lead on the development and delivery of teaching, of fundamental topics related to mechanical and aerospace engineering across the range of programmes and year groups in the school.</p> |                                                                                                                |
| About the Team                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                |
| <p>The successful candidate will join the <a href="#">Department of Mechanical and Aerospace Engineering</a> (MAE) within the School of Engineering, a vibrant community of around 150 academic and research staff and over 250 PhD students. Our nuclear and fusion research activity, underpinned by the flagship <a href="#">Dalton Nuclear Institute</a> brings together world-leading expertise in fission and fusion energy across multiple disciplines including nuclear thermal-hydraulics, computational engineering, materials modelling and advanced manufacturing. <a href="#">Fusion energy</a>, nuclear and materials research at Manchester is embedded within a rich interdisciplinary environment that connects engineering with the physical sciences, materials science and the wider energy sector. The appointee will be encouraged to engage with our <a href="#">Modelling &amp; Simulation Centre</a> which brings together over 40 academic staff with deep expertise across a wide range of topics in</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                |

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computational and digital engineering.

The appointee will contribute to this ecosystem by helping deliver and develop teaching & learning activities in both core and specialist topics related to fusion and nuclear engineering. The teaching opportunities for the appointee will also include contributions to the development, delivery and coordination of content in core areas of modelling & simulation, mechanics, structures & engineering design. We are particularly interested in candidates who can contribute to our practical activities in this area and those who have interest in nurturing the enthusiasm of our talented students via activities like [MancheSTAR](#), the first university Fusion society in UK.

Our staff benefit from a [fantastic new engineering building](#) with state-of-the-art facilities and a collaborative environment committed to innovation, interdisciplinary collaboration, and global research impact. For more information about our facilities see our [Tomorrow Labs](#).

### Key Accountabilities

- Development and delivery of internationally excellent research in one or more of the following topics, from an engineering perspective:
  - multiphysics modelling and simulation of fusion in-vessel components (breeder blanket, first wall and divertor);
  - development of digital twins, high-performance computing and AI/machine learning for fusion design and operation;
  - verification, validation and uncertainty quantification for fusion safety and licensing;
  - development of computational engineering tools for fusion materials modelling and structural integrity assessment
- Developing competitive bids for funding from research councils and other relevant sources such as industry and non-government bodies to support research activity and researchers.
- Publishing of research in leading journals and presenting at national/international conferences and in other fora relevant to stakeholders and end-users of the research.
- Undertaking teaching duties in areas related to modelling & simulation, mechanics, structures & engineering design, (including but not limited to assessment, academic advising and project supervision) within the University on undergraduate and postgraduate courses.
- Contributing to relevant service duties, commensurate with the level of appointment, to support efficient operation of the organisation. Engaging with relevant committees within the School and/or the University.
- Embedding social responsibility and environmental sustainability within teaching and research practice.

### Person Specification

- Educated to PhD level or equivalent in a topic closely linked to digital engineering for fusion energy, most likely via undergraduate degree in engineering, maths or physics.
- Proven track record in one of the areas of digital engineering for fusion energy described in the above section.

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- An established and continuing trajectory track record of research output in internationally leading journals relevant to fusion, nuclear or computational engineering, or other equivalent recognised forms of research output, e.g. impactful policy/industry reports;
- Excellent communication skills and evidence of developing/delivering successful collaboration with other academic researchers.
- Where the opportunity has arisen, demonstrable experience applying for funding from national and international research councils.
- Experience with or capability for establishing meaningful links with industrial partners which are directly or indirectly relevant to the fusion or nuclear energy sector.
- Ability to deliver lectures in an engaging way to classes of undergraduate students. Alternatively, significant experience of student project supervision (either as main supervisor or in a supporting role).
- Commitment to contributing improvements to advance our inclusive, equal and fair working environment.

### Key Behaviours

**One University:** A 'One University' approach, whereby we break down silos and work collaboratively towards furthering the University's strategic goals, vision and values.

**Service Excellence:** Committed to prioritising service excellence and high performance to deliver great people-centred experiences.

**Agility:** Demonstrate a commitment to agility and continuous improvement by embracing change, championing innovation, and being flexible and forward thinking to adapt.

**Sustainability:** A sustainable approach that safeguards the University of the future by championing environmental practices, advancing digital capability, and supporting financial stability and philanthropic initiatives.

**Inclusion:** A commitment to furthering equality, diversity, inclusion and wellbeing to create a positive work environment and culture.

**Social Responsibility:** Promote and champion the University's social responsibility ambitions to advance social inclusion, prosperous communities, better health, and cultural engagement.

**Freedom of Speech and Academic Freedom:** Support the University's commitment to securing and actively promoting the importance of free speech and academic freedom within our community.