



# Job Description

## Lecturer in Therapeutic Ultrasound

Department: Mechanical Engineering

Grade: 8

Location: UCL Bloomsbury Campus, London

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### Reports to

Head of Department

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### About the Department

UCL Mechanical Engineering has been pioneering the development of engineering education, having taught the core discipline for over 170 years. UCL was home to the UK's first ever Professor of the Mechanical Principles of Engineering, Eaton Hodgkinson, in 1847. It was also where Sir Alexander Blackie William Kennedy introduced organized laboratory practicals in university education training; a world-leading educational innovation at the time.

Today our students are taught core engineering disciplines and supervised in individual and group research projects by academics that are recognised research world-leaders in their fields. In the latest Research Excellence Framework (REF 2014) over 90% of the department's research was judged "world leading" or "internationally excellent".

At UCL Mechanical Engineering, we develop and apply core competencies to produce world-class research into a wider range of engineering challenges than most would imagine. Amongst many other avenues we are:

- Leading research into the manufacturing processes and properties of additively manufactured materials
- Developing lightweight structural materials for improved energy absorption, vibration damping, and fracture toughness
- Designing out plastic waste through new manufacturing processes and materials
- Designing the greenest engines and novel sustainable fuels

- Studying the flow of red blood cells in channels thinner than a human hair
- Leading research on designing low carbon shipping

Further information is available at

<https://mecheng.ucl.ac.uk/>

### About the Faculty

The Faculty of Engineering Sciences currently comprises eleven academic departments that undertake research and training across a broad range of disciplines on a global scale. Our teaching programmes are focused on subjects that have the greatest impact on the world around us, and their content is informed by internationally leading research. Further information is available at [www.ucl.ac.uk/engineering](http://www.ucl.ac.uk/engineering).

UCL is host to a flourishing community of engineers and scientists, conducting world-leading research, and supported by exceptionally strong links with governmental organisations and industry. Our scientists and engineers take discoveries from life sciences, pure maths, psychology and many other areas, mix them together, add their own innovations and produce technical solutions the world needs. The products, processes and students we produce change the world we live in and with our teaching we aim to take bright, thoughtful, creative people and give them the knowledge, skills, and experience they need to engineer a better world through innovative undergraduate and postgraduate degree programmes. In 2014, the Faculty of Engineering launched a new undergraduate degree programme – Integrated Engineering Programme based in Bloomsbury.

Further details may be found at <http://www.engineering.ucl.ac.uk/integrated-engineering/>.

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## **Main purpose of the job**

We are seeking an academic at Lecturer level within the Department of Mechanical Engineering, based at the Bloomsbury Campus. We are looking for a post holder with an excellent track record in research and teaching, with a focus on therapeutic ultrasound. The Department has strong research activities in biomechanical engineering in areas such as therapeutic ultrasound, cancer biomechanics and therapy, drug delivery, mathematical & computational modelling, cardiovascular biomechanics, bone implant mechanics, tissue engineering and surgical techniques. The post holder is expected to develop their own line of research, adding value to the existing strengths and developing new research topics.

The post holder will develop a network of collaborations within the Department and wider UCL with clinical and non-clinical academics. The candidate is expected to demonstrate the capability to generate high impact peer-reviewed publications, together with the potential to obtain research council funding.

In addition to research, the post holder will be expected to be passionate about teaching and to contribute to the Department's teaching delivery. The Department has a vibrant student community with a number of taught courses including MSc programmes.

The postholder will be an innovative engineer/scientist with strong leadership qualities, they will be capable of conducting robust science and to contribute to UCL as a world leading university.

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## **Duties and responsibilities**

The post holder will develop their own innovative research in the growing area of therapeutic/biomedical ultrasound. They will work within the Ultrasonics Group which has a strong track record of developing exciting new applications for ultrasound as a non-invasive therapeutic and diagnostic tool in medicine. These include tumour ablation, histotripsy, neuromodulation, drug delivery and tumour screening. The group also has a long history of developing powerful, mainly numerical solutions for the

propagation and scattering of ultrasound in complex media and will be releasing an open-source Boundary Element software suite for treatment planning. The post holder will have access to some of the best experimental and computational facilities in the world, across a range of specialist laboratories at UCL and its partner hospitals. The group's own Ultrasonics Laboratory houses a wide range of state-of-the-art ultrasonic equipment, such as the Verasonics research platform. The post holder is expected to develop close links with clinicians at our partner hospitals, other academic research groups and industry and contribute to the multi-disciplinary, creative culture of the group, department and faculty.

There will be flexibility to develop particular areas of interest and expertise. In addition, training will be provided where necessary, and there will be opportunities for continuing professional development through both formal and informal routes. There is considerable opportunity for career development and this will be supported by annual appraisal.

The successful candidate will be expected to:

- Develop a leadership role in research.
- Secure funded research in relevant fields.
- Pursue and lead collaborative research projects with other departments at UCL and promote national and international collaborations.
- To publish in high impact internationally leading peer-reviewed journals.
- To contribute to teaching and training within the Department, including supervising graduate research students and taking leadership roles in teaching delivery.
- To offer mentorship and development to less experienced colleagues.
- To contribute as appropriate to the Department and Faculty governance.
- To carry out any other duties commensurate with the grade and purpose of the post.

The successful candidate will need to meet UCL's expectations of core behaviours as outlined in <https://www.ucl.ac.uk/human-resources/policies-advice/core-behaviours-framework> including actively following and promoting UCL policies relating to Equal Opportunities, Equality and maintaining an awareness

and observation of fire and health and safety regulations.

All academic staff are expected to demonstrate their ongoing commitment to academic excellence; that is, to the conduct of research, publication, teaching, enabling and other forms of knowledge transfer, at the highest levels of international achievement. As duties and responsibilities change, the job description will be reviewed and amended in consultation with you.

# Person Specification

Criteria	Essential or Desirable	Assessment method (Application/Interview)
<b>Qualifications, experience and knowledge</b>		
Higher academic degree e.g. PhD, or evidence of an equivalent level of attainment in research publications.	Essential	Application
Postdoctoral research experience.	Essential	Application/Interview
Expertise in ultrasound physics.	Essential	Application/Interview
Experience of working in therapeutic/biomedical ultrasound.	Essential	Application/Interview
Experience of working with biological tissues/cells.	Desirable	Application/Interview
Experience of computational modelling of ultrasound propagation.	Essential	Application/Interview
Knowledge of cavitation and nucleation physics and bubble dynamics.	Desirable	Application/Interview
Experience of working at the interface of engineering/physics/mathematics and biological sciences or medicine.	Essential	Application/Interview
An internationally excellent record of scholarly publications in computational or experimental ultrasound applied to biomedical engineering.	Essential	Application/Interview
Experience of teaching at undergraduate and/or postgraduate levels.	Desirable	Application/Interview
Record of ability to supervise students (either undergraduate or postgraduate).	Desirable	Application/Interview
Candidates are expected to have one or more areas of experience in these areas: <ul style="list-style-type: none"> <li>• Numerical Simulation methods such as Finite Element or Boundary Element Methods</li> <li>• Ultrasonic Signal Processing and Analysis</li> <li>• Research Software Development</li> <li>• Ultrasound experimental research</li> <li>• R&amp;D experience in developing new medical innovations or research software</li> </ul>	Essential	Application/Interview
<b>Skills and abilities</b>		
Track record of publications in high quality and impact peer-reviewed scientific journals.	Essential	Application/Interview
Potential to submit competitive fellowship or personal award applications at an early stage of their appointment.	Essential	Application/Interview
Ability to build productive relationships with colleagues within and outside the Department of Mechanical Engineering.	Essential	Application/Interview

<b>Criteria</b>	<b>Essential or Desirable</b>	<b>Assessment method (Application/Interview)</b>
Ability to work collaboratively.	Essential	Application/Interview
Ability to supervise academic work by undergraduates, masters and doctorate students.	Essential	Application/Interview
Ability and commitment to teaching and other forms of public presentation.	Essential	Application/Interview
Ability to share in organisation and management of taught and research programmes.	Essential	Application/Interview
Ability to organise and prioritise workload, to delegate responsibility as appropriate and to supervise junior staff.	Essential	Application/Interview
Ability to use robust research methodologies to generate statistically relevant results in both in vivo and in vitro experiments.	Desirable	Application/Interview
Excellent communication skills/verbal and written; good command of written and spoken English.	Essential	Application/Interview
<b>Personal attributes</b>		
Willingness and ability to work collaboratively.	Essential	Application/Interview
Commitment to high quality academic research.	Essential	Application/Interview
Willingness to act collegially and contribute to Department, Faculty and University initiatives to improve teaching, learning and research.	Essential	Application/Interview
Commitment to teaching and pedagogy.	Essential	Application/Interview
Commitment to UCL's policy of equal opportunity and the ability to work harmoniously with colleagues and students of all cultures and backgrounds.	Essential	Application/Interview
Commitment to research integrity and an ethical approach to research	Essential	Application/Interview
Commitment to continuous professional development	Essential	Application/Interview
Commitment to fostering a positive work and learning environment	Essential	Application/Interview
Commitment to development of others.	Essential	Application/Interview
Involvement in professional activities external to the workplace	Desirable	Application/Interview