



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Summer Research Internship – Future Fluid Dynamics CDT
Faculty of Engineering and Physical Sciences



Salary: Grade 4 (£26,707 - £28,778 p.a.)

Reporting to: Prof Louise Jennings, School of Mechanical Engineering

Reference: EPSMA1137

Closing date: Monday 01 June 2026

Fixed term (between 6-12 weeks, available from 01 June 2026 - to complete specific time limited work)

Location: Leeds Main Campus

We are open to discussing flexible working arrangements

Summer Research Internship - Future Fluid Dynamics CDT, Faculty of Engineering and Physical Sciences.

Are you interested in gaining first-hand experience of the research environment in fluid dynamics at the University of Leeds? Would you like to explore this opportunity to help you make an informed decision about progressing to postgraduate research? Would you like to develop knowledge, skills and experience to strengthen your application for research degree opportunities?

The [EPSRC Centre for Doctoral Training \(CDT\) in Future Fluid Dynamics](#), hosts an annual internship programme throughout summer. This opportunity is designed to enhance access to postgraduate research for individuals from underrepresented groups, supporting a more diverse and inclusive research community.

The programme allows prospective postgraduate researchers to gain first-hand experience of the research environment in fluid dynamics at the University of Leeds. This experience will assist them to help informed decisions around progression to PGR and to develop relevant knowledge, skills and experience that can strengthen their applications to research degree opportunities. The centre provides advanced training and research opportunities in the field of fluid dynamics, with the aim of equipping future academics and industry practitioners with the interdisciplinary skills required to tackle complex fluid-related challenges across a range of industrial and scientific sectors. Research areas are Engineering and Physical Sciences, Environment, Biological Sciences, or Medicine and Health.

Widening participation

Applications are open to those who have **not** undertaken a research internship previously, and meet one or more of the following criteria:

- The first in their family to go to university;
- From Black, Asian or other minoritised ethnic groups;
- Neurodivergent (e.g. ASD, ADHD) and/or Disability (e.g. physical impairments, mental health condition, learning difficulties, chronic illness);
- Are female;
- Have caring responsibilities;
- Have been outside of education for 5 or more years;
- Studying/studied at a university that is not a member of the [Russell Group](#).



About the project

Title: Development & Validation of a 3D-Printed Cardiovascular Flow System

Children born with congenital heart valve defects frequently require surgical intervention to replace damaged heart valves. One common approach involves the use of biological heart valve substitutes, which are derived from animal sources (such as porcine or bovine) or allogeneic human donors. However, these valves can trigger an immune response in the body, which may lead to complications. To make the biological heart valve substitutes safer, we use a process called decellularisation, which removes all the cells from the tissue while keeping its structure intact. This helps reduce the risk of rejection and makes the valves more suitable for implantation.

This project aims to develop and optimise a custom 3D-printed cardiovascular flow system to decellularise porcine heart valve roots in a sterile, time-efficient, cost-effective, and scalable way. The system will control how liquid flows through the valve, including the speed and pressure, so that the cell removal process (decellularisation) happens evenly without damaging the valve's natural structure. The work includes optimising the design of flow system, selecting biocompatible/autoclavable materials, 3D printing, preparing tissue samples, and validating the Leeds decellularisation process. This project would suit someone interested about fluid dynamics and biomedical engineering, with an interest in experimental analysis of flow systems, additive manufacturing, and systems validation through laboratory experiments.

Overview of the role

To undertake independent research project supervised by an academic at the University of Leeds. This project will take place over 210 hours worked over a period of 6 weeks to 3 months during summer.

Main Duties and responsibilities

- Optimise design and assembly of a 3D-printed cardiovascular flow system using biocompatible, autoclavable materials, focusing on fluid flow control and pressure management;
- Check mechanical integrity and sterilisation tolerance of 3D printed flow system over multiple autoclave cycles;



- Prepare porcine heart valve roots for mounting on the system (roots supplied by supervisors);
- Check operation of the 3D printed cardiovascular flow rig (circulation of decellularisation solutions ensuring uniform flow distribution and without tissue damage, possibly decellularisation of porcine heart valve roots);
- Write standard operating procedure for the process.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

Developmental benefits

- Experience to work on a real biomedical science challenge by learning how the cell removal process (decellularisation) works and the performance of the system;
- Hands-on experience developing and running experiments in the medical engineering laboratories, working alongside a Research Fellow;
- The student will gain an appreciation of tissue preparation and sterilisation protocols used in biomedical engineering;
- The student will develop their CAD software skills (SolidWorks);
- The student will perform experimental validation of flow rigs, including circulation tests and optimisation of flow parameters using a peristaltic pumps or syringe drive to ensure precise control of flow rates and reproducibility of results;
- Working on a multidisciplinary project within the Institute of Medical & Biological Engineering gives the opportunity to interact with biologists and clinicians through participation in group/Institute meetings.

Qualifications and skills

Qualifications

- Open to graduates or current second- or third-year undergraduates eligible for the Home (UK) fee-rate at postgraduate research (PGR).



Essential

- Curiosity and willingness to learn skills and techniques;
- Critical thinking;
- Good verbal and written communication skills;
- Ability to work both independently and as part of a team;
- Project specific:
 - Basic proficiency in CAD software;
 - Basic understanding of fluid mechanics and pressure-flow relationships;
 - Interest in multidisciplinary biomedical project;
 - Willingness to perform experimental work in the biomedical laboratories.

Desirable

- Project specific:
 - Experience with laboratory instrumentation - e.g., peristaltic pumps, syringe driver, autoclave;
 - Knowledge of tissue engineering or biomaterials concepts.

How to apply

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by **23:59** (UK time) on the advertised closing date.

Please upload a supporting statement (Word or PDF) with the following details:

- An **introduction** to yourself and a **brief overview** of why you are applying for your chosen project and the internship;
- An outline demonstrating how you meet all **essential** and **desirable criteria** in the job description. Please address each criterion separately, clearly referencing the specific criterion;
- A description of which **widening participation criteria** mentioned in the job description you satisfy.



Contact information

To explore the post further or for any queries you may have, please contact:

[Professor Louise M Jennings](#), Professor of Medical Engineering

Email: L.M.Jennings@leeds.ac.uk

OR

Patricia Grant, Centre Manager

Email: P.Grant@leeds.ac.uk

Additional information

Faculty and School Information

Further information is available on the research and teaching activities of the [Faculty of Engineering & Physical Sciences](#), and the [School of Mathematics](#).

Working at Leeds

We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our [Working at Leeds](#) information page.

A diverse workforce

As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

We have identified that women are currently underrepresented in this role and particularly welcome applications. Candidates will always be selected based on merit and ability.



The Faculty of Engineering and Physical Sciences are proud to have been awarded the Athena SWAN [Silver](#) Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our [equality and inclusion webpage](#) provides more information.

Information for disabled candidates

Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our [How to Apply](#) information page or by getting in touch by emailing HR via hr@leeds.ac.uk.

Criminal Record Information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information page.

