National Centre for Combustion and Aerothermal Technology (NCCAT)
Department of Aeronautical and Automotive Engineering

Loughborough University

Specialist Research Technician

Job Ref: REQ240171

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

The National Centre for Combustion and Aerothermal Technology

The National Centre for Combustion and Aerothermal Technology (NCCAT) opened in 2020 and is a global centre of excellence that was funded through a partnership comprising the Department for Business, Energy and Industrial Strategy, the Aerospace Technology Institute, Innovate UK and with support from Rolls-Royce. The Centre builds on the long-standing strategic partnership between Loughborough and Rolls-Royce which was formalised in 1991 when the Loughborough based Rolls-Royce University Technology Centre in Combustion System Aerothermal Processes (UTC) was established. Residing within NCCAT, the UTC is an innovative strategic partnership which brings together a leading UK University with one of the world's foremost aerospace companies. The partnership provides a unique infrastructure in which Rolls-Royce and University staff work together to advance understanding and provide design capability in the field of Combustion Aerodynamics and Aerothermal technology. This cutting-edge collaborative research is driven by real industrial challenges and generates innovative technologies for current and next generation low emission gas turbine engines. Building on the experience of working with industry over the last 30 years, the National Centre incorporates a world leading research group of multi-disciplinary researchers within the fields of fluid mechanics and combustion, primarily targeting highly applied challenges faced by the aerospace gas turbine industry. With Rolls-Royce as a lead industrial partner, NCCAT primarily focuses on the development of future low emission aerospace combustion systems and will play a key role in moving towards sustainability and meeting the Government target of a carbon neutral economy by 2050.

NCCAT is an open-access laboratory and, beyond aerospace, supports commercial customers with the development of key technologies across several UK sectors, such as distributed power generation and measurement technology for harsh environments. This necessitates the development and application of highly specialised research techniques employing unique and technically complex test facilities. In addition, the Centre acts as a training ground for current and future aerospace engineers in a critical skill area for the UK, partially achieved through the current EPSRC Centre for Doctoral Training for Future Propulsion and Power (CDT) also hosted within NCCAT. Currently the research centre comprises around 55 personnel including academic staff, researchers, specialist technical staff, technicians, and an administrative support team. At any given time, the research group has many active research projects covering a wide range of Technology Readiness Levels (TRL's).

The Centre undertakes:

Commercial Activities: Support industrial partners in the development of future low emission aerospace combustion systems by providing access to state of the art facilities and research expertise.

Research Activities: Strategic research to develop technology critical to the development of next generation combustion systems.

Training: To train current and future aerospace engineers in a critical skill area for the UK. This includes industrial engineers along with post-doctoral researchers including students that form part of a joint Centre for Doctoral Training (with Cambridge and Oxford Universities).

To achieve this the Centre builds, maintains and operates highly specialised experimental facilities that incorporate various levels of technical complexity. For example, the laboratory operates test rigs both at elevated pressures/temperatures (as typically occur within a gas turbine engine) and at sub-atmospheric conditions that occur at high altitude and under which a combustion system must demonstrate its ability to relight. Maximising the opportunities associated with the test facilities will also require the application of state of the art experimental techniques. Hence, the technical staff provide a role in helping to advance the experimental techniques required and, in particular, support their application within the centres complex test facilities.

Job Description

Job Grade: Technical Grade 6

Job Purpose

The position and responsibilities are to act within a six-person technician team supporting the research work of the Centre. Duties will include the need to lead and manage assigned research facilities and areas within the technology Centre, although an ability to provide “transient” and/or “global” support throughout the technology Centre will be fundamental. The post holder will have a major influence in maintaining NCCAT’s reputation for the scheduling and delivery of high quality, high impact, and complex research.

Job Duties

- To be responsible for an assigned area of activity, whilst also being available for existing day-to-day technician duties within the Centre.

- Production of intricate items (using various materials and appropriate techniques) for rig construction/modification, development of in-house instrumentation and application of skills to resolve complex problems using a wide range of mechanical disciplines and equipment.

- Provide advice and work with research, specialist, and academic staff to define and develop technical approaches. This includes the design/construction of bespoke/specialist experimental apparatus and instrumentation to deliver novel technical solutions for the Centres’ activities.

- To be knowledgeable of, and implement, current and future ‘state of the art’ manufacturing/production techniques to support delivery of the Centre’s current and future experimental activities.

- Work with visiting commercial engineers/customers using the Centres’ experimental facilities to provide the required technical approaches that ensure commercial programmes can be delivered. This activity will demand an understanding of the needs of “live” engine programmes (as detailed by commercial customers) when working with sub-suppliers and necessitate visiting external facilities/customers/suppliers as and when required.

- In conjunction with research staff, assist in the operation of test facilities and the acquisition of experimental data when required.

- Analyse/diagnose technical problems associated with the operation of specialist experimental facilities.

- To maintain and reconfigure, when necessary, specialist experimental facilities and associated operational hardware/plant and support the application, maintenance, calibration, and repair of intricate experimental equipment.

- Plan/programme the technical requirements for research projects including the preparation of costs (e.g., material and tooling estimates) from preliminary specifications and to subsequently review, monitor and confirm delivery schedules.

- Operation/maintenance/testing/fault diagnosis of workshop plant, machinery, tooling, and consumable stocks within predefined budget allocations.

- Contribute to discussions on future experimental/strategic workshop and laboratory developments to ensure the Centres activities continue to be world leading.

- Assist in the scheduling and maintenance of the Centres infrastructure equipment and ensure general maintenance and security of buildings.

Health and Safety

- Promote and develop continual improvement of health and safety procedures and safeguards.

- Advise research staff/students on the health and safety implications during the development of new and existing test rigs and infrastructure.

- Carry out statutory risk assessments, manual handling and COSHH assessments within the work areas. To aid research staff in the formulation of risk evaluation and control as required; ensuring that others comply with current health and safety regulations.

Quality Control

- To ensure that quality control and working procedures are implemented and reviewed as required to meet the necessary standards.

- To advise and assist with quality control record keeping and the maintenance/up-keep of any equipment utilised within the UTC, such as periodic servicing and calibrations.

Teaching, Training, and Technology Transfer

- Provide technical teaching and share specialist experimental equipment repair/maintenance knowledge.

- To teach and supervise future Trainee Apprentice Technicians in all technical disciplines.

- To aid in the supervision and training of students, specifically in technical workshop disciplines.

- Meet the evolutionary requirements of the technical role e.g., Fuel compliance training “DSEAR and ATEX” standards.

Points to Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others, and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University’s Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University’s Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to: NCCAT Technical Manager

Person Specification

Your application will be reviewed against the essential and desirable criteria listed below. Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application. Stages of assessment are as follows:

(1) Application, (2) Test/Assessment Centre/Presentation, (3) Interview

Essential Criteria

Area	Criteria	Stage
Experience	Substantial or significant industrial or laboratory experience.	1,3
	Served a recognised engineering apprenticeship with significant experience and proven track record in precision engineering.	
	Significant experience in the use of a wide range of conventional machining techniques,	
	Knowledge of precision fabrication and assembly processes and experience in the design and production of bespoke items.	
	Experience in dealing with external suppliers of equipment and consumables for use in the production of test facilities or parts for test facilities.	
Skills and abilities	Excellent verbal and written communication skills, with a “strong” customer focus.	1,3
	Ability to integrate into a multidisciplinary team.	
	Flexible, willing, and reliable with good time management and organisational skills.	
	Ability to work under pressure and to tight deadlines.	
	Utilising and interpreting engineering drawings to aid in the manufacture of items as/when required.	
	The ability to explain design ideas and plan clearly.	
	A comprehensive knowledge of relevant legal Health and Safety regulations.	
	Ability to observe confidentiality at all times.	
	Ability to produce solutions to engineering problems and draft detailed designs for manufacture, preferably using a modern CAD package.	
Training	Able to demonstrate commitment to developing career through personal and professional development.	1,3
	A willingness to undertake further training as necessary, and to adopt new procedures as and when required.	
Qualifications	HND or equivalent vocational level qualification in an engineering subject, or substantial engineering experience.	1
Other	Detailed understanding of the University’s Equal Opportunities policy at all times.	1

Desirable Criteria

Area	Criteria	Stage
Experience	Experience of high pressure and temperature installations, control valves etc. for fluid transfer.	1,3

	Experience in the use/manufacture of instrumentation for use with fluid/aerodynamic and aerothermal test facilities.	
	Ability to programme and operate CNC machinery for the production of items if/as required.	
	Experience in the use of AutoCAD, Nx or similar drafting design packages.	
	Experience of electronics to assist in the production of lab items.	
	Experience of data logging equipment.	
	Knowledge or experience in the use and application of modern manufacturing techniques.	
	Experience in the use of laser equipment.	
	IT literate and experience in the use of standard office software.	
	Experience or knowledge of the storage, handling and use of fuels and petrochemical derivatives.	
Skills and abilities	Design, construction, and modification of experimental equipment.	1,3
	Excellent laboratory skills.	
	Ability to undertake day-to-day management of a project of your assigned tasks, and complete in a timely manner.	
	Experience of Health and Safety management.	
	Ability to use welding and fabrication techniques (e.g., MIG, TIG and oxyacetylene) for the production of lab items if/when required.	
Other	Willingness to travel.	1
	Willingness to undertake additional training leading to relevant qualifications	1

Conditions of Service

The position is full-time and open-ended. Salary will be on Technical Services Grade 6, £33,966 - £44,263 per annum, at a starting salary to be confirmed on offer of appointment. The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff/Operational and Administrative staff, details of which can be found here.

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at http://www.lboro.ac.uk/services/hr/a-z/family-leave-policy-and-procedure---page.html. We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html. In addition, the University is supportive, wherever possible, of flexible working arrangements. We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see http://www.lboro.ac.uk/services/hr/athena-swan/

Informal Enquiries

Informal enquiries should be made to Tim Haycock, Technical Operations Manager, via email at T.T.Haycock@lboro.ac.uk