

Technical Specialist: Robotics and Manufacturing

Job Ref: REQ240199

Job Grade: Technical Services Grade 6.

Background

The School of Architecture, Building and Civil Engineering has one of the largest laboratories in the UK covering aspects of teaching, research and innovation. Covering over 2000 m² of floor space with a variety of equipment directly relating to the testing and characterisation of physical materials together with Chemical, Biological testing facilities; multi-purpose workshops and laboratories covering Surveying, Building Energy, Water Engineering and Mixed reality and visualisation.

The School has a firm vision to be the world's leading integrated centre for built environment research and education, attending to the entire lifecycle of both buildings and infrastructure through our research, teaching and enterprise programmes. It is an outstanding School, evidenced by high league table rankings, strong student recruitment at high entry tariffs and well-established partnerships with world leading companies.

Teaching, Research and Enterprise within the School of Architecture, Building and Civil Engineering covers all disciplines in the construction and transport industries. The School thus benefits by having academic and support staff from a wide variety of backgrounds, offering a rich diversity of perspectives. Significant activity is based around our Innovative Manufacturing and Modelling workshops, laboratories and studios.

Loughborough University is offering an opportunity in a Specialist Research Technician role to support the School in manufacturing for construction and in particular the operation and development of the 3D concrete printing facilities, 3D optical metrology and other novel technologies for construction, maintenance and repair of infrastructure and the built environment.

Job Purpose

This is a primary technical post within the School to undertake the design, development, manufacture, fabrication and maintenance of a wide range of equipment, produced from a variety of materials, in support of research, postgraduate and undergraduate projects plus teaching, and enterprise work.

The role will include manufacture and system automation work in metal, plastics and cementitious and non-cementitious materials using robotic, automation and additive manufacturing systems driven by CAD, CAM and CNC.

A primary role will be the development, maintenance and operation of a 3D concrete printing test cell, including all related material production and metrology systems and also take leading technical responsibility for robotics and automation aspects of spray cementitious deposition equipment to support ongoing research into construction infrastructure repair and remediation.

The postholder will provide technical instruction, supervision and skilled technical support to undergraduate and postgraduate students plus academic staff and other technical staff on matters related to 3D printing, automation, robotics and relevant controlling software.

The post requires a highly motivated individual, with significant practical Engineering and machine software experience together with a flexible, adaptable approach to tasks as required in a dynamic research-oriented environment.

Duties and Responsibilities

1. To provide 3D printing, automation, robotics technical instruction and skilled technical advice to undergraduate students, staff and researchers and operational supervision and management where required.
2. To take an active participation in research, contributing to work, developing ideas and to take ideas forward for exploration and development in collaboration with academic and research staff and students.
3. To have supervisory responsibility for students, researchers and staff using robotics and automation facilities.
4. To maintain and prepare machinery within the school's 3D concrete printing and cementitious and non-cementitious manufacturing facilities together with robotics and auxiliary equipment to high Health & Safety standards for the safe and efficient use by students, researchers and staff.
5. To support the School's practical research programmes both on and off campus where appropriate.
6. To be able to present ideas and concepts both verbally and in written report formats.
7. To work collaboratively, flexibly and cooperatively with Technical Staff throughout the school to deliver a high quality, comprehensive Technical Service.

Research

1. Design development, construction, modification and installation of robot mounted automation equipment for construction manufacture and equipment for Academic staff, Researchers, Postgraduates, and Undergraduate use.
2. To manufacture, assemble and install equipment in support of research projects, using engineering machine tools and bench fitting skills.
3. Overseeing, guiding and making recommendations to academics and research staff on the design of equipment and models for manufacturing solutions.

Running automation and large-scale robotic printing equipment

1. To take responsibility for and maintain all of the construction automation, robotic and manufacturing facilities within the school, including managing the School's automation equipment and metrology systems and the security of associated machinery/equipment.
2. To be responsible for a budget concerned with the ordering of new equipment and consumables for the facilities including negotiating with manufacturers and suppliers for the procurement of materials, tools and equipment.
3. Adapting machinery for use with alternative materials, e.g., wood working machinery for plastics and vice versa.
4. Working closely with academic and technical staff to update procedures, plan future projects and manage equipment and laboratory space.
5. To support staff, students and other technicians with modifications and repairs to existing equipment for specialised research and project work. This extends to a high degree of technical knowledge using a range of conventional manufacturing machine tools in the lab and school workshops using metals, wood, or cement-based materials.
6. Production of technical design drawings.
7. To undertake other specialist manufacturing processes and subject to suitable training, to use an overhead crane and other lifting apparatus as required.

Health and Safety

1. To comply with current statutory health and safety requirements together with the University's health and safety policies.
2. To take a lead in all aspects of health and safety regarding automated manufacture. Working collaboratively with the School Experimental Officer with regard to developing best practice in the field of robotics.
3. To ensure that a safe working environment is maintained at all times through compliance with Health and Safety at Work legislation and the University's Operational Procedures.
4. Advising staff and students on Health and Safety issues. Actioning health and safety directives, writing procedures and following up to ensure compliance. Advise, assist and to carry out Risk Assessments on all appropriate machinery, apparatus and equipment as per the University's Provisions and use of Work Equipment Regulations Policy (PuWER)

Supervision Given

To have supervisory responsibility for students, researchers and staff working within direct areas of responsibility.

Supervision received:

The programme of work will vary based upon the research, teaching and enterprise needs within the School. There is no direct supervision of day-to-day activities and the post holder will only need guidance on complex problems and general issues that affect the lab complex as a whole.

Organisational Responsibility

Reports to the School Technical Facilities Manager.

Special Conditions - None

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.

PERSON SPECIFICATION

Job Title: Technical Specialist: Robotics and Manufacturing

Job Grade: Technical Services Grade 6

	Essential	Desirable
Education and Qualifications	<p>Relevant Advanced C&G, BTEC National or Higher Certificate or Diploma, or equivalent, or majorly significant relevant equivalent experience. (1,3)</p> <p>Successfully completed an apprenticeship scheme in an Engineering workshop Environment. (1,3)</p>	<p>Advanced C&G or HNC in an engineering or related subject or relevant degree/higher degree. (1)</p> <p>Ability to apply manufacturing techniques to a variety of materials including non-ferrous metals, wood and cementitious materials. (1,3)</p>
Experience	<p>Experience of Manufacture in a multi-disciplinary environment. (1,3)</p> <p>Wide ranging experience of undertaking computer driven manufacture (CAD, CAM and CNC and robotics). (1,3)</p> <p>Thorough understanding of relevant Health & Safety regulations and procedures. (1,3)</p>	<p>Involvement in. the set up and design of robotic based automation systems in a research or industrial environment. (1,3)</p> <p>Experience of working in Higher Education. (1,3)</p> <p>Experience of working with cementitious materials. (1,3)</p>
Skills and Abilities	<p>Have a strong ability and proven track record of designing, developing and manufacturing equipment for a wide range of uses. (1,3)</p> <p>Strong background in programming robotic and CNC environments. (1,3)</p> <p>Have proven ability to interpret ideas and sketches into high quality drawings, designs and final working models. (1,3)</p> <p>Have the ability to manage materials and equipment budgets. (1,3)</p> <p>Have the ability to design new equipment from general principles utilising core skills. (1,3)</p> <p>Professional, with good communication and team-working skills. (1,3)</p> <p>High level of accuracy, flexibility and dependability. (1,3)</p> <p>Proactive and able to work under own initiative with the ability to prioritise workload to meet objectives. (1,3)</p> <p>High level of I.T. skills including a thorough knowledge of CAD and Microsoft software e.g. Word, Excel. (1)</p>	<p>Current certificates in the safe use of robotic automation machinery and small machine shop equipment etc. (1)</p> <p>Ability to install and maintain equipment "On-Site" and in the "Field". (1,3)</p> <p>Instructional techniques/teaching qualification or certificate. (1,3)</p> <p>Working knowledge and experience of CAD/CAM software including 3D Slicers, Powermill and Rhino based Grasshopper. (1,3)</p> <p>Working knowledge of light-based 3D scanning systems, such as structured light and Optitrack. (1,3)</p> <p>Experience of data handling e.g. metrology data manipulation through proprietary software. (1,3)</p> <p>Experience of implementing control, sensing and feedback systems. including enabling software e.g. Lab View. (1,3)</p>

Training	Willingness to undertake training as appropriate and to adopt new procedures as and when required. (3)	
Other	Commitment to observing Health and Safety regulations at all times. (3) Willingness to travel in the UK as the job may require. (1)	Hold a full U.K. driving licence. (1)

Stages in Assessment: (1) Application Form, (2) Selection Test, (3) Interview

Conditions of Service

The position is full-time and open-ended.

This is a Technical Services Grade 6 Post with current salary £33,966 - £49,794 per annum which includes a market supplement for a suitably appointable external candidate depending upon qualifications and previous experience.

The appointment will be subject to the University's Conditions of Service Employment for staff Grade 6 and above, details of which can be found at: <https://www.lboro.ac.uk/services/hr/conditions-of-service/>

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 are welcomed and should be made to Mark Harrod, Technical Facilities Manager, by email at: m.harrod@lboro.ac.uk, or by telephone on +44 (0)1509 222638.

Applications

To be considered for interview it is important that applicants should satisfy the essential criteria in the person specification above. The closing date for receipt of applications is **7 April 2024**.