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| Last updated: | April 2023 |

**JOB DESCRIPTION**

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| Post title: | **Specialist Mechanical Workshop Technician** | | |
| School/Department: | School of Engineering | | |
| Faculty: | Faculty of Engineering and Physical Sciences | | |
| Career Pathway: | Technical and Experimental (TAE) | Level: | 4 |
| Posts responsible to: | Engineering Design and Manufacturing Centre (EDMC) Workshop Technical Manager | | |
| Posts responsible for: | L3 Apprentice (Supervisory) | | |
| Post base: | Non Office-based (see job hazard analysis) | | |

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| Job purpose |
| To provide specialist mechanical workshop technical services to the School of Engineering and its’ customers for education, research and enterprise. To work to modern, high quality standards, applying innovative, novel techniques and ideas where standard solutions do not exist. To undertake in-depth, sophisticated mechanical design and manufacturing for the school and its customers, ensuring items produced are compliant with regulation, University policy and engineering standards, often to tight timescales. |

| Key accountabilities/primary responsibilities | | % Time |
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|  | Thorough, in depth, innovative design of highly sophisticated experimental and prototype mechanical equipment for education, research and enterprise in the School of Engineering and it’s customers to high precision, tight timescales whilst adhering to engineering/safety standards. Full use of 3D Computer Aided Design (CAD) software packages, Mechanical simulation and multidisciplinary collaboration to ensure design success. Full recording of information and data produced for design re-use or further development. | 25% |
|  | Research and further innovative development of existing commercial or previous experimental complex mechanical designs in order to improve experimental data, safety, reliability or adapt purpose for use in world leading scientific research, education or enterprise endeavours. Consult on the development of experimental/prototype designs to commercial design for manufacture and marketing as required for the school, it’s customers and collaborators. | 20% |
|  | Manufacture of complex components and assemblies using both traditional craft skills and cutting-edge modern techniques, for example Computer Numerically Controlled (CNC) milling/turning, Computer Aided Machining (CAM), 3D printing in a variety of materials selecting the most efficient and suitable technique for each process to ensure high quality, reliable and precise articles are manufactured to high engineering and safety standards. | 15% |
|  | Consultation with customers from inception to delivery of projects to find optimum solutions.  Eliciting as detailed specifications as possible from non-engineering oriented individuals.  Developing specifications from scientific test data including taking test data, as necessary.  Monitor and report on progress of projects throughout, advising management and customers through suggested methods and approaches to mitigate non-completion or project slip. | 10% |
|  | Use university computer systems to provide estimates for proposed work and then record time and materials spent on projects to meet budget requirements and withstand scrutiny by funding providers and financial audit. Where required manage the budget for the tranche of mechanical design and build allocated from specific projects.  Use University systems, procedures and policies to purchase materials and services from suitable suppliers. |
|  | To provide a repair and fault-finding service, including planned maintenance regime of equipment and devices within the work environment, advising on future resource requirements. | 5 % |
|  | To ensure compliance with health and safety processes within the working environment including acting as Area Safety Office for defined laboratories and facilities as appropriate. | 10% |
|  | To attend internal and external meetings to ensure issues are represented in project work and more generally in the University environment, leading to continuous improvement. | 5% |
|  | To help plan, organise and manage the work environment. Contribution to recruiting, training and developing the whole technical team in ones own specialist skills. Supervising non-technical staff (e.g. ERE) and students as necessary, advising on specialist techniques as required, exercising extra caution due to complex technical or H&S issues not obvious to the less experienced e.g. apprentices. Suggest improvements to the service and inform the school on new techniques and equipment that could be employed or acquired to enhance capabilities, efficiency and quality. | 5 % |
|  | Any other duties as allocated by the line manager following consultation with the post holder, including contribution to academic publications as required/requested. | 5 % |

| Internal and external relationships |
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| Other members of the School/University staff at all levels.  Undergraduate Students.  Masters Students.  Postgraduate researchers  External customers (External research organisations, industrial partners etc)  Relevant suppliers and external contacts.  Contractors.  Training providers.  Apprenticeship providers. |

**PERSON SPECIFICATION**

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| Criteria | Essential | Desirable | How to be assessed |
| Qualifications, knowledge and experience | |  | | --- | |  |   **Skill level equivalent to** achievement of Level 6 of the NQF (Degree) [**comparison chart**](https://www.gov.uk/what-different-qualification-levels-mean/compare-different-qualification-levels). Or equivalent industrial/professional experience  Substantial experience in mechanical design using 3D Computer Aided Design (CAD) modelling packages in complex designs.  Experience of engineering materials, process and techniques to design and manufacture high quality precision parts within tight tolerances  Substantial experience of Computer Aided Manufacture (CAM) software packages (e.g. OneCNC, Fusion 360) to aid Computer Numerical Control (CNC) manufacture.  Extensive experience in CNC and manual machining such as lathes, mills, drills and Surface grinding.  Experience in design and fabrication of sheet metal work.  Experience in precision hand tool work.  Appreciation of safe lifting operations.  Ability to make effective use of standard office computer packages such as word processing, spreadsheets etc. | Experience of working in a scientific HE School or research facility.  Membership of relevant technical professional body.  Formal training in Autodesk Inventor CAD package.  Experience/qualification in welding of a variety of metals including stainless steel and aluminium alloys.  Extensive range of on the job and academic training achieved in similar roles.  Experience in writing/enhancing post processor files.  Experience of design and manufacturing using non-standard materials such as machinable ceramics, their selection and suitability in variable environments.  The ability to program, set and operate CNC Machinery  Experience of Fanuc and XYZ programming languages.  Additional skills utilising Robot Arms and Metal Additive Manufacturing. | Interview/Application/Trade test |
| Planning and organising | Able to progress a broad range of activities within professional guidelines and in support of University policy and any School strategy.  Experience of successful project management.  Ability to work within the bounds of cost to provide good value to projects.  Plan and monitor project progress, reporting regularly to customers and management, suggesting ways to mitigate problems encountered.  Ability to use knowledge of strategy and recurring work themes to adapt project design/plan to utilise engineering design re-use or design new engineering modules/assemblies for use in further projects, thus reducing project timescales and customer wait times. | Project management qualification. | Interview/Application |
| Problem solving and initiative | Ability to apply novel engineering solutions together with proven sound engineering techniques/solutions to help solve complex scientific problems presented by non-engineering persons or through analysing in depth scientific data. |  | Interview/Application |
| Management and teamwork | Able to proactively work with colleagues in other work areas to achieve outcomes.  Able to work in multidisciplinary projects to achieve a cohesive design.  Experience of successfully managing and developing staff.  Able to delegate effectively, understanding the strengths and weaknesses of team members, customers and students to build effective teamwork.  Able to formulate development plans for own staff to meet required skills. | Experience of training apprentices. | Interview/Application |
| Communicating and influencing | Able to provide accurate and timely specialist guidance on complex issues.  Able to use influencing and negotiating skills to develop understanding and gain co-operation with other technical staff, ERE staff, students, suppliers, contractors, customers and other university units. |  | Interview/Application |
| Other skills and behaviours | Proactive in promoting a working environment that is inclusive and engaging; recognising the value diversity brings. |  | Interview/Application |
| Special requirements | Willingness to undertake Health and Safety training specific to role.  Willingness to not only adhere to Health and safety regulation/policy but also actively help to enhance the provision and culture for oneself, other colleagues, students and customers. | Willingness to engage with the opportunities that the Technician Commitment brings.  IOSH/NEBOSH | Interview/Application |

**JOB HAZARD ANALYSIS**

**Is this an office-based post?**

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| Yes | If this post is an office-based job with routine office hazards (eg: use of VDU), no further information needs to be supplied. Do not complete the section below. |
| No | If this post is not office-based or has some hazards other than routine office (eg: more than use of VDU) please complete the analysis below.  Hiring managers are asked to complete this section as accurately as possible to ensure the safety of the post-holder. |

## - HR will send a full PEHQ to all applicants for this position. Please note, if full health clearance is required for a role, this will apply to all individuals, including existing members of staff.

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| **ENVIRONMENTAL EXPOSURES** | **Occasionally**  (<30% of time) | **Frequently**  (30-60% of time) | **Constantly**  (> 60% of time) |
| Outside work |  |  |  |
| Extremes of temperature (eg: fridge/ furnace) | X |  |  |
| ## Potential for exposure to body fluids |  |  |  |
| ## Noise (greater than 80 dba - 8 hrs twa) |  |  |  |
| ## Exposure to hazardous substances (eg: solvents, liquids, dust, fumes, biohazards). Specify below:  Small quantities standard workshop solvents with appropriate controls.  Dust/fumes with appropriate controls (LEV).  Coolant with appropriate management.  Welding in line with R/A and LEV | X |  |  |
| Frequent hand washing |  |  |  |
| Ionising radiation |  |  |  |
| **EQUIPMENT/TOOLS/MACHINES USED** | | | |
| ## Food handling |  |  |  |
| ## Driving university vehicles(eg: car/van/LGV/PCV) |  |  |  |
| ## Use of latex gloves (prohibited unless specific clinical necessity) |  |  |  |
| ## Vibrating tools (eg: strimmers, hammer drill, lawnmowers) | X |  |  |
| **PHYSICAL ABILITIES** | | | |
| Load manual handling | X |  |  |
| Repetitive crouching/kneeling/stooping |  |  |  |
| Repetitive pulling/pushing |  |  |  |
| Repetitive lifting |  |  |  |
| Standing for prolonged periods | X |  |  |
| Repetitive climbing (ie: steps, stools, ladders, stairs) |  |  |  |
| Fine motor grips (eg: pipetting) |  |  |  |
| Gross motor grips |  |  |  |
| Repetitive reaching below shoulder height |  |  |  |
| Repetitive reaching at shoulder height |  |  |  |
| Repetitive reaching above shoulder height |  |  |  |
| **PSYCHOSOCIAL ISSUES** | | | |
| Face to face contact with public | X |  |  |
| Lone working |  |  |  |
| ## Shift work/night work/on call duties |  |  |  |