ROLE PROFILE

Job Title: Research Associate/ Fellow in Mechanical Machine Design of Rotating Machinery

School/Department: Engineering

Job Family and Level: Research and Teaching Level 4/4a (Appointment will be Level 4 Career training grade where an appointment is made before PhD has been completed)

Contract Status: This full time post will be available immediately and will be offered on a fixed term contract for a period of 24 months.

Hours of Work: Full time; 36.25 hours per week

Location: Faculty of Engineering, Jubilee and University Park Campuses

Reporting to: Professor Chris Gerada

Purpose of the Role:
Working within a globally recognized, multidisciplinary centre of excellence and alongside key aerospace industrial partners, this post is associated with ongoing research in high performance rotating machine design and development targeting next generation hybrid-electric and all-electric aircraft. The successful candidate will undertake research, analyse, and develop rotating machine design solutions including structural and rotor-dynamic optimization for challenging applications.

Main Responsibilities

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<td>1.</td>
<td>To research/develop innovative mechanical design solutions for rotating machinery, in particular electrical machines</td>
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<td>2.</td>
<td>To design structural components and carry out FEA structural analysis of the active and inactive parts within electrical machines</td>
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<td>3.</td>
<td>To analyse and develop rotor-dynamic solutions for challenging dynamic requirements (ex. very high speed applications)</td>
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<td>4.</td>
<td>To understand system-level design considerations and consider their implications within the mechanical design undertaken</td>
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<td>5.</td>
<td>To commission development rigs, liaising with technicians as appropriate.</td>
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<td>6.</td>
<td>To deliver research as part of a collaborative team and contribute to the achievement of specific research objectives.</td>
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<td>7.</td>
<td>To collaborate in writing papers for submission to journals and conferences and prepare progress reports on the results of research.</td>
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<td>8.</td>
<td>To assist in the co-ordination of the research and related administrative tasks, including liaising with external project collaborators and providing assistance with supervision of doctoral students.</td>
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<td>9.</td>
<td>To write up research work for publication and/or contribute to the dissemination at national/international conferences, resulting in successful research outputs.</td>
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<td>10.</td>
<td>To build relationships with both internal and external contacts in order to exchange information, to form relationships for future collaborations and identify potential sources of funds and/or opportunities for collaboration.</td>
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<td>11.</td>
<td>To co-ordinate the operational aspect of research networks, for example, arranging meetings and updating websites etc and contribute to collaborative decision making with colleagues in area of</td>
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11. To provide support, guidance and supervision to other staff within the research team, where appropriate in own area of expertise.

12. To supervise undergraduate and/or postgraduate students projects and placements, as appropriate. To participate in the assessment of student knowledge and co-supervise projects at Masters and PhD level.

13. To utilise and contribute to organising research resources, facilities and laboratories as appropriate.

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<th>Knowledge, Skills, Qualifications &amp; Experience</th>
<th>Essential</th>
<th>Desirable</th>
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| **Qualifications/Education**                  | • Good (2.1) first degree (or equivalent) in mechanical engineering or a related subject.  
• PhD or equivalent (or about to obtain) and post-doctorate research on rotating machinery | • PhD or equivalent and post-doctorate research on rotating machinery |
| **Skills/Training**                           | • Proven Research skills.  
• Excellent oral and written communication skills, including the ability to communicate with clarity on complex information.  
• Ability to apply finite element packages for structural design and analysis  
• Knowledge of conventional and advanced manufacturing techniques  
• Strong CAD background  
• Good programming ability  
• High analytical ability to analyse data, and find technical solutions.  
• Ability to assess and organise resource requirements and deploy effectively.  
• Ability to build relationships and collaborate with others, both internally and externally. | • Ability to foster a research culture and commitment to learn in others.  
• Ability to test the mechanical design solutions  
• Vibration analysis  
• Familiarity with the design of rotating machines  
• Knowledge on the design of mechanical gearing systems  
• Knowledge of tribology  
• Analytical and numerical skills of heat transfer and thermo-fluid flow  
• Ability of carrying out rotor-dynamic design and analysis |
| **Experience**                                | • Previous experience in a research environment.  
• Experience of finite element analysis in a research environment.  
• Mechanical and rotor-dynamic design experience of rotating machinery | • Experience with testing and validating mechanical design solutions  
• Experience of integrating developed mechanical designs of sub-systems into more complex systems  
• Experience with gear design and tribology |
| **Statutory/Legal**                           | • Ability to work well in a team environment.  
• Ability to work to deadlines and prioritise tasks.  
• Excellent presentation skills. | • Demonstrate creativity and leadership in problem solving; liaising with engineers and managers from industry |