



Job title	Research Associate/Fellow in Electrical Machines	Job family and level	Research & Teaching Level 4 (Appointment will be Level 4 Career Training Grade where an appointment is made before PhD has been completed)
School/ Department	Engineering - PEMC	Location	Jubilee Campus

Purpose of role

The role will undertake advanced research in the design, modelling and development of electrical machines, with particular emphasis on electromagnetic design, analytical modelling and numerical analysis. The successful candidate will develop and apply analytical and computational methods to evaluate machine concepts and topologies, optimise designs and solve challenging research problems, working closely with multidisciplinary colleagues and industrial partners.

	Main responsibilities (Primary accountabilities and responsibilities expected to fulfil the role)	% time per year
1	Electrical Machine research, design and analysis - Detailed electromagnetic design, sizing and analysis of electrical machines. - Develop and apply analytical electromagnetic models to support machine understanding, performance prediction, design and optimization - Develop and evaluate machine concepts and alternative topologies using 2D and, where appropriate, 3D finite-element analysis - Analyse machine performance, losses, saturation and relevant high-frequency electromagnetic effects - Contribute original ideas and work with thermal, mechanical, materials and manufacturing specialists on multidisciplinary designs.	60%
2	Experimental validation and technical analysis - Plan or contribute to appropriate experimental validation of electrical machine designs and models - Analyse experimental data and correlate measured behaviour with analytical and numerical predictions - Investigate discrepancies between predicted and measured performance and use evidence to improve models and designs.	20%
3	Dissemination of results Prepare research reports, technical documentation and high-quality research publications	10%

	▪ Present findings to industrial and academic partners and contribute to new research ideas and, where appropriate, intellectual property.	
4	Collaborative research and industrial engagement ▪ Work collaboratively with academic researchers, engineers, students and industrial partners ▪ Contribute technically to project meetings and design reviews and take increasing ownership of defined research activities.	10%

Person specification

	Essential	Desirable
Skills	▪ Proven research and analytical problem-solving skills ▪ Excellent oral and written communication skills, including the ability to communicate complex technical information clearly ▪ Ability to apply electromagnetic finite-element analysis packages to the design and analysis of electrical machines ▪ Good programming and computational modelling ability ▪ Ability to analyse electromagnetics analytically and use analytical models for machine performance prediction ▪ Ability to develop, assess and optimize electrical machine concepts and topologies ▪ Ability to plan or contribute to experimental validation and critically analyse experimental results ▪ Ability to build relationships and collaborate effectively with colleagues and external partners ▪ Self-motivated, proactive and able to take ownership of technical activities with appropriate supervision.	▪ Familiarity with thermo-mechanical design and analysis of rotating machinery ▪ Experience in experimental testing or characterization of electrical machines ▪ Knowledge or experience of electrical machine control and drive systems ▪ Experience of optimisation or automated machine-design methods ▪ Ability to lead, teach or mentor other researchers and students.
Knowledge and experience	▪ Strong knowledge and understanding of electrical machines and electromagnetics ▪ Research experience in the design and analysis of electrical machines or closely related electromagnetic systems ▪ Experience of analytical electromagnetic modelling relevant to electrical machines ▪ Experience of electromagnetic finite-element analysis in a research or engineering environment ▪ Experience of report writing and communication of research results in journals, conferences or equivalent technical outputs. ▪ Previous experience in a research environment	▪ Experience across more than one electrical machine topology ▪ Experience of advanced, high-performance or emerging machine technologies, including advanced conductors or innovate 3D topologies ▪ Experience of electromagnetic loss analysis or high-frequency effects. ▪ Experience in the manufacture or assembly of electrical machines ▪ Industrial or collaborative research experience ▪ Experience contributing to research proposals.

Qualifications, certification and training (relevant to role)	▪ PhD or equivalent (or near completion) in electrical machines, electromagnetics, electrical engineering or a closely related subject area, with a substantial research component in electrical machine design, modelling or analysis.	▪ Relevant post-doctoral, industrial or collaborative research experience in electrical machines
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Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

Valuing people	Is friendly, engaging and receptive, putting others at ease. Actively listens to others and goes out of way to ensure people feel valued, developed and supported.
Taking ownership	Is clear on what needs to be done encouraging others to take ownership. Takes action when required, being mindful of important aspects such as Health & Safety, Equality, Diversity & Inclusion, and other considerations.
Forward thinking	Drives the development, sharing and implementation of new ideas and improvements to support strategic objectives. Engages others in the improvement process.
Professional pride	Is professional in approach and style, setting an example to others; strives to demonstrate excellence through development of self, others and effective working practices.
Always inclusive	Builds effective working relationships, recognising and including the contribution of others; promotes inclusion and inclusive practices within own work area.

Key relationships with others



