



Job title	Mechanical Design Engineer	Job family and level	Administrative, Professional and Managerial Level 4
School/ Department	Faculty of Engineering	Location	PEMC, Jubilee Campus

Purpose of role

The role will involve applying a range of professional engineering skills in order to develop, design, manufacture, commission, and test novel electrical machines and systems. This role encompasses all aspects of the mechanical engineering development including requirements capture, problem structuring, business case development, mechanical design, simulation, management of manufacturing, system integration, test design, data capture and analysis, and reporting.

Working as part of a team, the role holder will assume a significant role in implementing solutions for industrial end-users and may also be required to act as technical lead in some projects. This role will work closely with researchers from Nottingham and our partner universities (Cambridge and Sheffield), and collaborate with leading industrialists from companies such as Airbus, BAE Systems, GKN, Rolls Royce, and Siemens.

	Main responsibilities (Primary accountabilities and responsibilities expected to fulfil the role)	% time per year
1	<p>Technical Activities</p> <ul style="list-style-type: none"> • Develop and design novel mechanical design solutions for parts and assemblies including machines, converters, fixtures and tooling for manufacture and components for test rigs. • Apply mechanical design analysis tools to validate and troubleshoot new and existing machine designs • Create detailed manufacturing drawings, with appropriate tolerancing, assembly drawings (to BS8888) and bills of materials for manufacture. • Manage manufacture and assembly builds with key stakeholders. • Contribute to the development of build philosophies, best design practices and quality for research demonstrators. • Develop solutions in line with Technology Readiness Level (TRL) / Manufacturing Readiness Level (MRL) criteria and carry out TRL / MRL assessments. • Carry out quality checks, measurements and tests on machine builds, fixtures, and test rigs, where appropriate, conducting appropriate data analysis and reporting. • Provide expertise to the team on advances in CAD, CAM, and related topics. 	60%

	<ul style="list-style-type: none"> • Provide expertise to the team on design for manufacture and industrial requirements. 	
2	<p>Project Management</p> <ul style="list-style-type: none"> • Develop project plans, work plans, and schedules in collaboration with senior colleagues and project stakeholders. • Define research objectives in collaboration with senior colleagues and project stakeholders. • Manage resources in order to achieve research outputs. • Organise and participate in project meetings and technical workshops. • Track and report project progress. 	10%
3	<p>Engagement</p> <ul style="list-style-type: none"> • Interact with research partners and industrial partners (potentially spending time at UK partner sites) to establish industrial requirements and specifications. • Utilise these customer requirements to drive the development of new and innovative systems. • Participate in and present at relevant meetings. 	10%
4	<p>Dissemination & Exploitation</p> <ul style="list-style-type: none"> • Write technical reports and papers to disseminate results. • Disseminate results through oral presentations at meetings, with industrial and research partners. • Support the exploitation of results through the identification of new IP and/or publications. 	10%
5	<p>Proposal Development</p> <ul style="list-style-type: none"> • Support proposal development and submission to industry and to regional, national, and international funding bodies. 	5%
6	<p>Other</p> <ul style="list-style-type: none"> • Any other duties appropriate to this post. 	5%

Person specification

	Essential	Desirable
Skills	<ul style="list-style-type: none"> ▪ Good analytical and problem-solving skills. ▪ Excellent interpersonal skills: <ul style="list-style-type: none"> ○ Strong written and verbal communication skills with attention to detail. ○ Active listening skills. ○ Strong team player. ▪ Excellent organisation and time management skills with a proven ability to work to deadlines. 	<ul style="list-style-type: none"> ▪ Skilled in one or more of the following: <ul style="list-style-type: none"> ○ Structured problem solving
Knowledge and experience	<ul style="list-style-type: none"> ▪ Skilled in the use of at least one 3D CAD package. ▪ Proven mechanical design skills for conceptual and detailed part and assembly design, sizing and tolerancing calculations. ▪ Proven experience in producing detailed part and assembly drawings with appropriate tolerancing, to BS8888 or equivalent standards. ▪ Experience of designing, planning and implementing a manufacturing system, mechanical system, test rig, or similar. ▪ Good understanding of materials, manufacturing and assembly processes, and design for manufacture. ▪ Experience of working in a relevant industrial or research environment. ▪ Experience of project management. 	<ul style="list-style-type: none"> ▪ Skilled in the use of at least one simulation tool e.g. 3D Finite Element Analysis (FEA) for stress, thermal or dynamics evaluation or Computational Fluid Dynamics (CFD) for fluid analyses. ▪ Experience in mechanical design and analysis of rotating machines. ▪ Experience in quality control to ensure parts conform to drawings and tolerances. ▪ Experience in delivering design projects in either industrial or research environments. ▪ Experience of working on regional, national or European funded projects ▪ Understanding of aerospace manufacturing and assembly processes and tooling. ▪ Strong working knowledge of design standards and implementation thereof. ▪ Experience of working with industrial automation. ▪ Experience communicating drawings and requirements with technicians / machinists ▪ Experience of hands-on machine and test rig assembly
Qualifications, certification and training (relevant to role)	<ul style="list-style-type: none"> ▪ BEng or equivalent in Mechanical / Aerospace / Automotive Engineering at 2:1 or equivalent 	<ul style="list-style-type: none"> ▪ MEng in Mechanical / Aerospace / Automotive Engineering at 2:1 or equivalent ▪ PhD or equivalent in a relevant field ▪ Professional registration with the Engineering Council (CEng)



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 always equitable and fair and works with integrity. Proactively looks for ways to develop the team and is comfortable providing clarity by explaining the rationale behind decisions.
- Taking ownership** Is highly self-aware, looking for ways to improve, both taking on board and offering constructive feedback. Inspires others to take accountability for their own areas.
- Forward thinking** Driven to question the status quo and explore new ideas, supporting the team to “lead the way” in terms of know-how and learning.
- Professional pride** Sets the bar high with quality systems and control measures in place. Demands high standards of others identifying and addressing any gaps to enhance the overall performance.
- Always inclusive** Ensures accessibility to the wider community, actively encouraging inclusion and seeking to involve others. Ensures others always consider the wider context when sharing information making full use of networks and connections.

Key relationships with others

