

Academic Role Profile

<b>Job Title:</b>	Professor
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<b>Responsible to:</b>	Head of Department or Faculty
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<b>Responsible for:</b>	Research staff employed on programmes and awards directed by the post holder. May have supervisory responsibility for other staff.
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<b>Job Summary and Purpose</b>
<p>To develop and lead a significant programme of research in line with the Faculty's research strategy, attracting and securing significant research funds.</p> <p>To provide academic leadership in undergraduate and postgraduate courses within area of expertise.</p>

<b>Main Responsibilities/Activities</b>
<p><b>To develop the research activities of the Faculty and the University by:</b></p> <p>Leading a significant programme of research, sustaining an extensive track record of published research findings in appropriate, peer reviewed research journals and/or monographs to maintain and enhance expert reputation in own subject area.</p> <p>Planning, co-ordinating and leading a significant programme of research in accordance with a specific project plan through a research team or a group of staff involved in research. Managing the financial and physical resources associated with the research activities. Supervising and guiding the work of staff and research and doctoral students on own specialist area.</p> <p>Leading innovative research proposals and submitting funding bids, winning support for them and planning the research to be taken, as a self-contained item or as part of a broader programme. Obtaining and sustaining research, consultancy and other additional funding</p> <p>Seeking collaborative research opportunities with other members of Faculty staff and develop multidisciplinary research links with other parts of the University where appropriate.</p> <p>Developing research activities which extend current thinking in the subject area, thereby enhancing the reputation of the Faculty and the University.</p> <p>Maintaining an expert reputation in own subject area and providing appropriate guidance to staff and students</p> <p>Engaging in external activities in accordance with the Faculty's research strategy at a national and international level. Such activities will include membership of committees of academic and professional bodies, external examining, editing journals and contribution to professional networks, national and international meetings, societies and bodies (including governmental ones).</p> <p>Engaging in external activities in accordance with the Faculty's research strategy at a national and international level. Such activities will include contribution to professional networks, national and international meetings, societies and bodies (including governmental ones).</p>

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Attending appropriate national and international conferences for the purpose of disseminating research results.

Leading major funding bids which develop and sustain research support for the specialist area and advance the reputation of the Faculty and the University.

Sustaining and developing professional expertise and maintaining the requirements for registration with the appropriate body (*for academics with clinical links only*).

Contributing to the wider national and international academic community general life and work of the University through, for example, editing journals and refereeing papers.

### **To develop the teaching activities of the Faculty by:**

Providing academic leadership at undergraduate and/or postgraduate level, as appropriate, by leading the development of new teaching methods and designing programme units and taking responsibility for the quality of programme units.

Taking an active role in teaching at undergraduate and postgraduate level; planning, delivering and critically reviewing a range of teaching and assessment activities including lectures.

Setting/marking programme work, practical sessions, supervisions, fieldwork and examinations according to own area of subject specialism, and providing appropriate feedback to students.

Taking part in activities such as validating and examining in relation to the University's associated institutions.

### **To engage in scholarship by:**

Continually updating knowledge and understanding in the field or specialism. Extending, transforming and applying knowledge acquired from scholarship to teaching, research and appropriate external activities.

### **To undertake pastoral care of students by:**

Using listening, interpersonal and pastoral care skills to deal with sensitive issues concerning students and provide support. Appreciating the needs of individual students and their circumstances. Acting as personal tutor and giving first line support. Taking responsibility for the initial resolution of all student issues within and outwith standard procedures, and ensuring that an appropriate framework is developed and used for pastoral care issues.

### **To contribute to the efficient management and administration of the Faculty, the University and the wider academic community by:**

Performing personal administrative duties throughout the Faculty and the University as are recognised by the University as properly within the remit of role of professor, such as research group leader and roles associate with teaching programmes, as allocated by the Head and contributing to the general life and work of the University.

Advising, supervising and giving guidance to other staff. Taking overall responsibility for the welfare of staff drawing on specialist advice and support.

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### Person Specification

#### The post holder must have:

A higher professional qualification, normally a doctoral degree or equivalent

Outstanding qualities and achievements in scholarship and research at a national and international level which have made a significant contribution to the advancement of their subject

Significant academic publication record

Evidence of leadership in research, including postgraduate research supervision

Teaching programmes, and/or internationally recognised textbooks.

Evidence of securing a significant amount of sustained research funding

Proven management and leadership qualities at a senior level

Proven administrative ability at a senior level

Evidence of contributions to conferences, professional meetings and societies at an international level and evidence of achievements in other external activities at an international level.

Evidence of high quality teaching at undergraduate and postgraduate level

### Relationships and Contacts

Professors are expected to accept invitations to serve on national and international bodies, including governmental bodies. They will also be expected to contribute to the University by taking on roles that enable the University to meet its administrative needs.

To attract research funding, a Professor will be expected to liaise with existing and potential sponsors.

Teaching and administrative duties will be allocated by the Head of Faculty, within the context of the teaching programmes agreed by the Faculty Learning and Teaching Committee

### Special Requirements

The post holder is expected to work outside normal office hours as necessary.

#### All staff are expected to:

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Help maintain a safe working environment by:
  - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand

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- Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Undertake such other duties within the scope of the post as may be requested by your Manager.

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### Addendum

This document provides additional information relating to both specific aspects of the post/Faculty and any post specific person specification criteria. The information contained within this document should always be read in conjunction with the accompanying generic Job Purpose.

Job Title:	Professor in Mechanical Engineering Sciences
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### Background Information/Relationships

#### Faculty:

The University of Surrey is organised into three Faculties. The Faculty of Engineering and Physical Sciences (FEPS) comprises the Departments of Chemical and Process Engineering, Civil and Environmental Engineering, Computing, Electronic Engineering, Mathematics, Mechanical Engineering Sciences and Physics alongside the Centre for the Environment and Sustainability. The Faculty is built on the core engineering disciplines of aeronautical engineering, biomedical engineering, civil engineering, chemical engineering, electronic engineering and mechanical engineering, together with the core scientific disciplines of computing, materials, mathematics and physics. Within these fields we enjoy a reputation for excellence in research and teaching, allied to a strong enterprise culture and an unrivalled record of graduate employment. Our members of academic staff are well respected, both nationally and internationally, amongst the many areas of academia and industry with which we interact. We believe strongly in the principle that a university should contribute to the cultural wealth of society by developing the basic sciences, whilst also developing the technology which will improve our overall quality of life.

#### Department of Mechanical Engineering Sciences (MES):

MES currently has around 35 FTE academic staff and about 750 students who are studying on a range of programmes from BEng/MEng through MSc to EngD/PhD. We offer four strong professionally accredited undergraduate programmes in Mechanical Engineering, Biomedical Engineering, Aerospace Engineering and Automotive Engineering. All of the programmes have the option of a year of Professional Training. The programmes are supported by a range of well-equipped laboratories and computer suites, including a new Engineering Design Centre, incorporating our very successful Formula Student activity. The Department, and its degree programmes, are rated in the top 10 in the UK league tables.

Research is highly rated and is carried out in four Centres: Aerodynamics & Environmental Flow (A&EF), Automotive Engineering, Biomedical Engineering and Engineering Materials.

Aerodynamics and Environment Flow, is the largest of the four research Centres in MES, addressing challenges in aeronautical, environmental and industrial aerodynamics, including turbulent flows, turbo-machinery, wind energy, novel propulsion, advanced flow sensors and design optimisation. The group includes the Rolls-Royce supported Thermo-

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Fluid Systems University Technology Centre, which specialises in advanced computer modelling of turbomachinery for aeroengine and power generation, and the Environmental Flow (EnFlo) laboratory, which is part of the NERC National Centre for Atmospheric Science. EnFlo provides a nationally unique resource for studying (i) a wide range of environmentally important flow and dispersion problems, (ii) wind power and associated meteorology. Other research activities include aero-thermal aspects for electric propulsion systems, development of advanced flow sensors, and multi-disciplinary design optimisation. Research is funded by EPSRC, NERC, InnovateUK, Rolls Royce, Airbus and other public- and private-sector sources.

The members of the Centre for Automotive Engineering work on hybrid vehicles, vehicle dynamics and control and terrestrial mobile and space robotics. The group has extensive and active research links in the form of major research grants and contracts with vehicle manufacturers such as Jaguar Land Rover, Skoda, Fiat, McLaren Automotive, Williams and Gordon Murray Design and original equipment manufacturers such as Lucas Varity and Orlikon Graziano.

The Centre for Biomedical Engineering has an active interest in human movement. The group's prior focus was on gait, focussing on lower limb amputees and individuals with cerebral palsy or recovering from a stroke. As a result of this work, the group has acquired an 8-camera Qualysis motion capture system and force-plate equipped laboratory that forms the core of the human movement studies. Expertise has extended to an interest in upper body movement, especially that originating from the shoulder, in a range of populations from dancers to the elderly. The second main theme of the group is microelectronics and signal processing, with work on dielectrophoresis, which has resulted in a spin-out company, DEPtech, and the processing of signals from, for example, electroencephalograms for the diagnosis of Alzheimer's disease.

Materials is one of the University's multi-disciplinary research themes and as such the Centre for Engineering Materials in MES contributes to the wider University research agenda. The group has particular strengths in interfacial studies (from fundamental adhesion studies through the joining of dissimilar materials to the modelling of complex joint configurations) and composite materials (with a particular interest in developing nanocomposite materials for supercapacitors and incorporating sensors to produce smart structures). There is a growing interest in bespoke functional and structural materials produced via additive manufacturing. These activities incorporate extensive advanced characterisation of both microstructures and properties; for example, the group hosts the MicroStructural Studies Unit (with scanning, transmission and scanning transmission electron microscopy and associated spectroscopies), the Surface Analysis Laboratory (with atomic force microscopy, X-ray photoelectron spectroscopy, time-of-flight secondary ion mass spectroscopy and Auger electron spectroscopy) and the Mechanical Testing Laboratory (with a suite of instruments enabling the quasi-static and fatigue loading of a

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range of sample sizes and configurations). The group also has joint activities with the Surrey Space Centre and is keen to develop these collaborations further.

The Department also hosts the EPSRC Centre for Doctoral Training in Micro- and NanoMaterials and Technologies (MiNMaT) and runs the Engineering Doctorate (EngD) in MiNMaT. EPSRC have provided over £9M (matched by industry) to fund a total of 100 doctoral students over ten intakes from 2009 onwards. Each student spends the majority of their four year programme working with an industrial sponsor at the sponsor's premises.

#### Relationships:

The appointee will report to the Head of Department. S/he will establish working relationships with staff (including other academics, researchers, technicians and support staff) and students in the Department in addition to staff in the wider Faculty and university, as appropriate. S/he will liaise with sponsors and external bodies informally and formally, as necessary.

#### Person Specification

This section describes the sum total of knowledge, experience & competence required by the post holder that is necessary for standard acceptable performance in carrying out this role. This is in addition to the criteria contained within the accompanying generic Job Purpose.

	Essential/ Desirable
A higher research degree (PhD)	E
Expertise in an appropriate area of experimental aerodynamics complementing existing research within the Department	E
Strong publication record with a track record of publishing in high quality (such as upper quartile) journals.	E
Excellent communication and inter-personal skills.	E
Good organisational skills	E
Success in attracting research funding.	E
Experience of supervising postgraduate students.	D
Experience of delivering high quality teaching.	D
Chartered engineer status.	D

#### Key Responsibilities

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This document is not designed to be a list of all tasks undertaken but an outline record of any faculty/post specific responsibilities (5 to 8 maximum). This should be read in conjunction with those contained within the accompanying generic Job Purpose.

1. Undertake high quality research, as evidenced by a strong publication record and other metrics associated with successful outcomes, that complements one or more of the existing activities within the Department.
2. Apply for funding to support research activities and research students.
3. Deliver a high quality teaching and learning experience to students undertaking undergraduate and postgraduate activities, particularly, but not exclusively, with an emphasis on the design and solid mechanics areas of the curriculum.
4. Participate in a range of Departmental and University administration activities, as required.
5. Provide pastoral care to students, for example as a Personal Tutor, as appropriate.

N.B. The above list is not exhaustive.