

TWO UNIVERSITY LECTURESHIPS IN ENGINEERING FOR THE LIFE SCIENCES

- 1) Lecturer in Computational Engineering for the Life Sciences
- 2) Lecturer in Mechanics of Biological Materials

**Further Particulars**

We wish to appoint two lecturers who have proven or promising research record and who will contribute to new Departmental teaching in the area of Engineering for the Life Sciences.

**THE DEPARTMENT**

The Department of Engineering at the University of Cambridge is a vibrant and leading international centre for research. Its core strengths span all of the major engineering disciplines. The Department provides a unique environment for the evolution of engineering, which is distinguished by:

- the extremely high calibre of its engineering academic staff, students and support staff
- its emphasis on creativity and problem solving, founded on the development and application of fundamental science and mathematics
- the sense of being a networked community of highly talented individuals working in engineering.

The Head of the Department is Professor K Glover. The academic staff of the Department consists of: 43 Professors, 25 Readers, 60 Senior Lecturers and Lecturers as well as a large number of contract research staff. There are also 31 academic-related staff (Design Engineers, Administrators, Computer Officers, the Librarian etc.) and 250 technical and administrative support staff.

The Department has a divisional structure which is not aligned with traditional engineering departmental boundaries and this gives the Department greater flexibility in responding to new initiatives:

Division A: acoustics, fluid mechanics, turbomachinery and thermodynamics

Division B: electrical engineering

Division C: mechanics, materials and design

Division D: civil, structural and environmental engineering

Division E: manufacturing and management

Division F: information engineering, control theory, signal processing, machine intelligence and computational and biological learning.

Life Sciences research and teaching spans across the divisional structure of the Department.

More information on the Department can be found at [www.eng.cam.ac.uk](http://www.eng.cam.ac.uk)

**THE UNIVERSITY**

The city of Cambridge is in the south east of England, 50 miles north of London. It is well served by road and rail links, and is within an easy distance of the major London airports.

Cambridge University is famous for its heritage of scholarship, historic role and magnificent architecture. This heritage supports one of the world's most important centres for teaching and research. The collegiate structure gives a strong sense of community, and the University is at the forefront of international scholarship and research.

Throughout the last 800 years, its contribution to the world has ranged from the discovery of the mechanism of blood circulation to the structure of DNA, from the great philosophers of the early 15th Century, to the groundbreaking work of its many Nobel Prize winners.

## THE ROLE

### Engineering for the Life Sciences

The Department is promoting a number of research themes that address major global challenges. Engineering for the Life Sciences is a key theme within the Department's strategy and offers a significant opportunity as the demand grows for a quantitative mechanistic understanding of biological systems. Emerging models can predict and quantify the behaviour of natural actuators (muscle and molecular motors within the cell), natural sensors (hearing, vision) and physiological functions (respiration, cardiac activity). Engineering for the Life Sciences covers a broad remit, from using numerical techniques to address problems analytically, to the development of artefacts and equipment to assist in medical diagnosis and treatment. Length scales are from molecular to macroscopic. Professor Daniel Wolpert has recently joined the Department as the Professor of Engineering (1875) to develop Engineering for the Life Sciences. Informal enquiries for both Lectureships can be addressed by email to Prof Wolpert (wolpert@eng.cam.ac.uk).

#### *Lecturer in Computational Engineering for the Life Sciences*

The successful candidate will have experience in the field of computational engineering approaches to life sciences. Research activity could include quantitative modelling approaches in engineering applied to biological systems or intervention techniques. Applications range from, but are not limited to, molecular motors, the folding of proteins, the mechanics of the cell, soft and hard tissue and physiology.

#### *Lecturer in Mechanics of Biological Materials*

The successful candidate will have experience in experimental approaches to an understanding of biological materials and/or the development of artificial materials with biological function. Applications range from, but are not limited to, the mechanics of hard and soft tissue from sub-cellular to tissue level, and the development of new materials with application to tissue and prosthetics.

For both posts there are substantial opportunities for interaction with established research groups to allow an inter-disciplinary approach to biological problems. The lecturers will be expected to work as part of a team to develop teaching and research in Engineering for the Life Sciences. The appointees will be expected to carry out research and to supervise research projects and research students. The successful candidates will also be expected to teach courses in the four-year engineering course, which leads to the BA and MEng Degrees. Preference will be given to suitably qualified applicants with a record of excellence in research in the field and/or industrial experience, and an ability and enthusiasm for teaching.

## Research

It will be seen that the above Departmental Divisions are not aligned with traditional engineering departmental boundaries and activities relevant to the Life Sciences are to be found in all divisions. This research includes work on: Biomaterials, Biomechanics, BioMEMS, Biosensors, Computational Neuroscience, Computational Modelling of Soft Tissue, Medical Imaging, Signal Processing for biological systems and Systems Biology. Limited start-up funding may be available from the Department and from the EPSRC.

In addition there are opportunities for collaboration with the strong biological and physical sciences departments throughout Cambridge. Cambridge provides a vibrant research environment with many University centres of excellence together with a number of major research centres. The promotion of inter-disciplinary research is of key importance and recent developments would include for example the recently formed the Cambridge Computational Biology Institute. This institute

represents a collaboration across four Schools within the University (the Schools of Technology, Physical Sciences, Biological Sciences and the Clinical School) with a remit to coordinate University-wide activities at the interfaces between the Life Sciences, Physical Sciences and Technology.

## **Teaching**

All undergraduate students take common courses in their first two years, before specialising in their third and fourth years. The four-year course leads to the degrees BA and MEng for all branches of engineering.

There are approximately 1,200 undergraduate and 500 postgraduate students in the Department. The standard of both undergraduate and graduate entry is exceptionally high.

A major new initiative within the Department is the development of a new teaching area in Engineering for the Life Sciences. This area will provide interdisciplinary training between engineering, biology and medicine. The area will focus on

- Understanding living things through application of engineering sciences. Modules will cover engineering principles of molecular biology, bioinformatics, mechanics of biological tissues, systems physiology, and neuroscience.
- Developing devices, algorithms and processes that advance biology and medicine. Modules will cover biomaterials, biomedical imaging, application of microelectromechanical systems for biological sensing (BioMEMS) and biomimetics.

The teaching responsibilities associated with the posts lie predominantly across the third and fourth years in the general area of Engineering for the Life Science. The successful candidates will be expected to make a significant contribution to teaching of new and existing modules. There is scope for the lecturers to help shape the continuing development of the Engineering for the Life Science course including practical classes. In the 4<sup>th</sup> year, students also do a major project and there is considerable scope for the development of novel projects.

## **TERMS AND CONDITIONS OF EMPLOYMENT**

### **Duties**

It is the duty of University Lecturers to devote themselves to research, teaching and examining in their subject. Presently teaching duties include from 2 to 5 hours lecturing per term-time week, and up to 10 hours per week demonstrating and project supervision with the actual amount depending on other contributions. All appointments are subject to the Statutes and Ordinances of the University.

The Department attaches great importance to the generality of its approach to teaching, not being divided into separate specialist departments. Persons appointed will be expected to play their part in the general teaching programme of the Department and this may mean teaching outside their precise area of specialisation

### **Tenure of Appointment**

The initial period of appointment will be five years and, subject to satisfactory completion of a probationary period, appointment to the retiring age will be confirmed. The details of the University's probationary scheme are made available on appointment.

The current pensionable scale of stipends for University Lecturers is in the range of £25,565 to £39,452 per annum.

Most Lecturers are Fellows of a College. College fellows are usually required to enter into a teaching commitment for the college, in return for which they are typically paid an additional salary of £4000 - £5000. Additional college benefits usually include free meals, travel grants and assistance with accommodation or home loans. Lecturers may also retain external income which they receive from book royalties, consultancies, etc.

A University officer is required to be a member of the Universities Superannuation Scheme. The USS runs a final salary scheme and the pensions benefits paid by USS are based on salary and length of service. A dependants' scheme is included.

### **Sabbatical Leave**

Cambridge is unusual in having statutory provision for leave of absence of one term for every six terms of service. The privilege must be applied for but is not unreasonably withheld. Teaching staff use this opportunity for study and research. A maximum of 18 terms may be accumulated at a time, to give one year of leave for six years of service.

### **Recruitment Package**

The University has a scheme whereby in appropriate cases a single recruitment incentive payment may be made on appointment.

### **Relocation Expenses**

The University has a scheme to provide financial assistance with relocation costs for moves within the UK and overseas.

Persons appointed from abroad may also be reimbursed for the cost of travel to take up the appointment for them and their family.

### **Housing**

There are a limited number of furnished flats (managed by the University) which may be available for newly appointed staff while they make arrangements for house purchase. A large number of houses and flats are available to rent in the private sector in Cambridge. The University Accommodation Service at 18 Silver Street (Tel 01223 338099) is able to provide contacts and help for rented accommodation. Alternatively, there are a large number of independent letting and estate agents in the City.

### **Equal Opportunities**

The following statement of policy on equal opportunities has been approved by the University (Reporter, 1998-99, p.944): "The University is committed to a policy and practice which require that entry into employment with the University and progression within employment should be determined only by personal merit and by the application of criteria which are related to the duties of the particular appointment and the relevant stipend or salary structure. No applicant for an appointment in the University, or member of staff once appointed, will be treated less favourably than another on the grounds of sex (including gender reassignment), marital status, race, ethnic or national origin, colour, or disability. If an employee considers that he or she is suffering from unequal treatment on grounds of sex (including gender reassignment), marital status, race, ethnic or national origin, colour, or disability, he or she may make a complaint which will be dealt with through the agreed procedures for dealing with grievances. "

## **Health screening on appointment to University Office**

The General Board agreed in 1994 that Officers of appointment made to prospective University officers whose work will fall within certain categories will be conditional on the completion of a medical questionnaire and, if necessary, on a satisfactory health check by the Occupational Health Service. The successful candidate will be asked to complete the questionnaire at the time of appointment.

## **Appointments Process**

The closing date is 1 March 2006 and applications should be sent to the Secretary of Department (Personnel), Department of Engineering, Trumpington Street, Cambridge CB2 1PZ, UK (tel +44 (0) 1223 332615, fax +44 (0) 1223 766364, email [personnel-appointments@eng.cam.ac.uk](mailto:personnel-appointments@eng.cam.ac.uk)). Applications should include a completed form (PD 18), a curriculum vitae, a list of publications, and a one-page statement of research interests and future plans.

The interviewing panel will meet soon after the closing date and agree a procedure for short-listing candidates who will be invited to visit the department, give a short technical lecture and attend a formal interview. This may include soliciting references before a final short-list is agreed. It is anticipated that the selection process will take place at the end of March/beginning of April 2006.