School of Engineering

engineering the future

THE UNIVERSITY of EDINBURGH

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What's in a Name?

After 7 years as the *School of Engineering and Electronics*, we have simplified that rather clumsy and verbose name to simply *The School of Engineering*. This name change also recognises and celebrates the fact that, while we still teach the majority of our students under the traditional engineering disciplinary banners and toward the engineering professions, we have become a largely interdisciplinary School. Most of our research now spans engineering disciplines, draws in scientists and mathematicians and reaches out to, for example, clinicians, environmentalists and even fire brigades. Our more recent degree titles include, at MSc level, *Bioelectronics, Sustainable Energy Systems* and *Carbon Capture & Storage*.

These draw in elements of Medicine, Social Science, Geosciences and beyond. At undergraduate level, the recognisable "brand names" of Chemical, Civil, Electrical/Electronic and Mechanical Engineering are still our primary educational routes. However, B.Eng and M.Eng. degrees that bring in elements of, for example, renewable energy and environmental concerns are now an important part of the School's portfolio.

The change of name is also slightly ironic. In making the decision, we considered a number of possibilities, including *Engineering Science*, to recognise our commitment to teaching the "hard stuff" of Engineering and thus to educate the innovators of tomorrow. The choice of simply Engineering takes us right back to the original *Department of Engineering* (c1900) and to the original *Regius Chair of Engineering*. **It seemed like a good idea at the time … still is!**

Research Assessment Exercise 2008

The School of Engineering, formed in 2002 from the previous departments of Chemical, Civil, Electrical and Electronic and Mechanical Engineering, demonstrated its strength and breadth in the 2008 research assessment exercise (RAE) which is run by the Government to assess all University Departments for the quality of their research. Research Assessment Exercises have been held in the UK in 1986, 1989, 1992, 1996, 2001 and 2008. In the most recent exercise in 2008 the School of Engineering was ranked 3rd in the UK (1st in Scotland) for research quality and quantity. The Research Fortnight (**http://www.see.ed.ac.uk/news/Archive/UOA25RankingsResearchFortnightPower.pdf**) analysis, which ranks departments by both the quality and quantity of research, calculates that the top 2 are, predictably, Cambridge and Oxford. Edinburgh was a very clear 3rd with Imperial College 4th. In the assessment 55% of our research was ranked as either world-leading or internationally excellent and all of our research is deemed to be internationally recognised. This is an extremely encouraging result that recognises the quality, scope and volume of research in our interdisciplinary Research Institutes, addressing major research challenges that include Energy and Environment, Communications, Bio-Engineering & Electronics and Fire Safety.

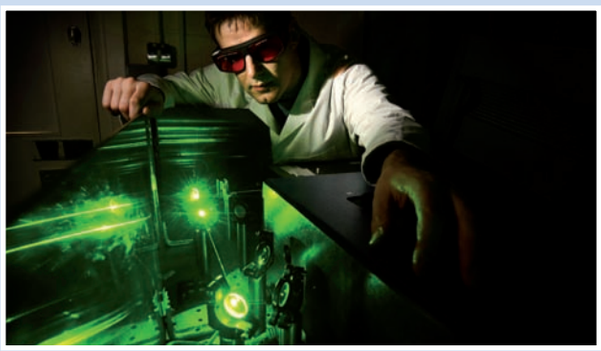
IVF Hope after Sperm Test Success

Scientists have revealed details of a high-tech breakthrough which could help childless couples.

Edinburgh University researchers have developed a method of testing the sperm quality before it is used for IVF. They have said the technique could help childless couples in the next five to 10 years.

The new test measures the DNA quality of sperm, but unlike existing tests, it does not kill the sperm, so it can still be used for IVF treatment.

Dr Alistair Elfick, lead scientist on the project funded by the Engineering and Physical Sciences Research Council, said: "In natural conception the fittest and healthiest sperm are positively selected by the arduous journey they make to the egg. What our technology does is to replace natural selection with a DNA based 'quality score'."



RHX: A Revolutionary Dating Method for Archaeological Ceramics

Scientists have found a way of dating archaeological ceramics – by defining how they react with moisture from the air. The simple method promises to be as important for dating ceramic materials (pottery, brick and tile) as carbon dating has become for organic materials such as bone or wood. A team from the Universities of Manchester and Edinburgh has discovered the technique, which can be used on fired clay ceramics such as bricks, tiles and pottery. Working with The Museum of London, the team has dated brick samples from Roman, medieval and modern periods with remarkable accuracy. Their technique has been used to determine the age of objects up to 2,000 years old – and the team is confident that it will date ceramics 10,000 years old and more.

Contact:

email: seenews@see.ed.ac.uk
tel: +44 (0) 131 650 5567 fax: +44 (0) 131 650 6554
www.see.ed.ac.uk

Hybrid Car Drives Down Fuel Costs

A car that uses half the fuel of normal vehicles in cities has been built with technology originating at the University. Artemis Intelligent Power, a company formed by University researchers, has converted a BMW 530 saloon. The car's carbon emissions have been cut by an average of 30 per cent in combined city and motorway driving.

Hydraulic technology

The car works with a computer-operated hydraulic drive system. The technology, called Digital Displacement®, maintains the flexibility, power and strength associated with traditional hydraulic technology, but uses much less fuel. The engine drives a Digital Displacement® pump which sends its output power, via hoses, to two Digital Displacement® motors driving the rear wheels. When the car brakes, the system captures and stores energy which would normally be lost. This is then used when the car next accelerates.

Fuel economy

The car runs on a mixture of stored energy and petrol, switching seamlessly between the two. Computer control ensures that the engine operates at its most efficient speed, using a minimum of fuel. The technology is also compatible with diesel and biofuel. The project was supported by the Department for Transport and the Energy Saving Trust. Digital Displacement® is a registered trademark of Artemis Intelligent Power Ltd.

Student Prizes

Our students have had another very successful year winning prizes in various categories:

Undergraduate wins Essay Prize

Congratulations to Shaun Farquhar, a fourth year Chemical Engineering with Management student, who has won the Engineering Subject Centre Student Award 2009 run by the Higher Education Academy. He was awarded the prize of £250 by Dr Simon Steiner, Academic Advisor, Engineering Subject Centre.

PhD Student wins 1st Prize in National Telford Institute Poster Competition

Mr Atif Mustafa, a final year PhD Student, has won the first prize for his poster on Integrated Constructed Wetlands at the National Telford Institute Workshop on Sustainable Urban Water Management: "Promoting Internationally Leading Research in Sustainable Urban Water Management at Scottish Universities". Sixteen posters entered the final stage of the competition.

Shaun Farquhar receives his prize from Dr Simon Steiner. Picture courtesy Engineering Subject Centre, The Higher Education Academy.

One New Fellow

Congratulations to Professor Steve McLaughlin who has been elected as a Fellow of the Royal Academy of Engineering. He is the Director of Research in the School and researches primarily in the areas of communications and signal processing. He is also the Dean of Research at the College of Science and Engineering.

Royal Honours

Professor Peter Grant was awarded the Officer of the Order of the British Empire (OBE) in the Queen's birthday honours list in June 2009, for services to science, and Visiting Professor Quentin Leiper was awarded the Commander of the Order of the British Empire (CBE) for services to the sustainability agenda.

SMC Based Researchers win IET Premium Award

Dr Stewart Smith, a University of Edinburgh researcher based at the SMC, recently attended the prestigious annual awards ceremony of the Institution of Engineering and Technology (IET) in London. Along with his colleague, Dr Tong-Boon Tang, they received the IET Nanobiotechnology Premium Award on behalf of their colleagues from Mr Chris Earnshaw, President IET, for a paper published in 2007 entitled "Development of a miniaturised drug delivery system with wireless power transfer and communication".

KTP Award Winning Partnership

The Knowledge Transfer Partnerships (KTP) project led by the BRE Centre of Fire Safety Engineering at The University of Edinburgh with Powerwall Systems Ltd won the Best Partnership Scotland Award given at the KTP 2009 Awards ceremony in London, 5th March. The project sponsor was The Technology Strategy Board.

Alumni News

Alumnus Wins UK's Biggest Engineering Prize

Former University of Edinburgh Fire Group member Dr Marianne Foley is part of the team that won the 40th MacRobert Award, the UK's biggest prize for engineering innovation in Arup's visionary Beijing Aquatic Centre, known as the Water Cube.

Graduates Share Artemis Success

Mechanical Engineering graduates Niall Caldwell, Jack Lavender and Fergus McIntyre played key roles in winning this year's 'Green Product of the Year' award for Artemis Intelligent Power Ltd, a University spin-out company based in Loanhead just outside Edinburgh. The judges of the British Engineering Excellence Awards were impressed by the way in which the Artemis Digital Displacement® Hybrid Transmission halved the urban fuel-consumption of a BMW 530i saloon car.

Artemis has also just been awarded a £1m grant by the UK Department of Energy and Climate Change to develop a Digital Displacement® wind-turbine transmission.