In the department

As we prepare for the start of what will be the 40th year of the Eng Maths degree at Bristol, we are set to see the third successive class size of 70+. We are also excited by the launch our new MSc in Engineering Mathematics; the predicted cohort of a dozen or so is amazing since we didn’t start advertising till February this year. We are also set to welcome about 60 to the interdisciplinary Robotics MSc which we manage on behalf of the Bristol Robotics Lab, jointly with the University of West of England.

This newsletter provides just a brief sense of what is going on. Much more can be found on our website. Our blog www.engmaths.org contains thought pieces related to the themes of the degree: mathematical modelling, data science, engineering, and bio-medicine. Content comes from many sources. See over for how the brand of Eng Maths, encompassing big data and technology across robotics, transport, bio-medicine etc., is gaining ground all over the world. We would love to hear from you. If you’ve got any news, please drop us an email.

We’ve released a short movie about our degree programmes www.youtube.com/watch?v=XmlRcF6aXik We’ve also a version with Chinese subtitles. Please share!

In terms of new facilities, in addition to the £11M New Wing and a £200K student “hackspace” in the MVB, our dedicated Eng Maths student project lab has been refurbished this summer to a fresh, bright, collaborative design from the Eng Maths Undergraduate Society.

With new appointments, new teaching facilities, inspiring students and ground breaking research, it looks like an exciting year ahead. We hope you can share it with us.

University initiatives

The big data institute

The opportunity to use complex data sets is changing research practice and key challenges are emerging around making data meaningful. The Jean Golding Institute for Data Intensive Research supports multi-disciplinary cutting edge research in the field of applied data science at the University of Bristol. A data visualisation working group has just been set-up. For updates follow on twitter @JGIBristol

SETsquared for business incubation

The enterprise collaboration between the Universities of Bath, Bristol, Exeter, Southampton and Surrey was voted by UBI Global as the No.1. university business incubator in the world. It supports over 9,000 graduates and undergraduates, and provides opportunities to gain hands-on business skills. The Bristol location is at the Engine Shed close to Temple Meads station. Check out the Student Enterprise Award and start-up programme at www.setsquared.co.uk/student-enterprise.
Eng Maths around the world

The department recently featured in an article in the influential SIAM News, the magazine of the US-based Society for Industrial Applied Mathematics which surveyed the rise of a modern Engineering Mathematics and related degree courses around the world. One such programme is run by the Institute for Computational and Mathematical Engineering at Stanford University. According to Margo Gerristen who leads the institute, “The term ‘engineering mathematics’ comes from an era when physics, mechanics, and mathematics were more closely tied together. With the dawn of high-powered computing, larger data sets, and new mathematical methods, engineering mathematics departments have begun to branch out into more exotic interdisciplinary realms, leaving students with ever more compelling career options.” She goes on to add that “employers want to build data mining and machine learning applications in-house, so they need [graduates who] understand the engines involved” which very much echoes comments made by our own Industrial Advisory Board.

At the University of Texas, Prof Mary Wheeler from the Institute of Computational Engineering and Science, where they have learned “Companies don’t want to prove theorems. Generally in engineering, you see more of applying the research and invalidating or verifying it.”

Sweden is known as a powerhouse in the theory of engineering mathematics, through such universities at Lund, the Royal Institute of Technology (KTH) in Stockholm, and Chalmers University of Technology in Gothenburg.

The full article, which is linked from our blog, lists similar programmes at Caltech, Columbia, Harvard, NYU, Princeton in the USA, Milan, Turin in Italy, at the Ecole Polytechnique in France, the Technical Universities of Budapest, Denmark and Munich and at Tsinghua University in Beijing. The in-demand nature of the graduates from these programmes are also highlighted through their varied career paths. For example Jacob Leander from Sweden worked on car GPS systems at Volvo and then as a clinical pharmacometrician at AstraZeneca says “I use my engineering background in a setting where most people don’t have that sort of detailed knowledge about the mathematics. So I really enjoy it.”

A spotlight on . . .

Math and Data Modelling 2 is our second-year activity in which groups of students act as consultants on technical projects in four separate rotations. In one 5-week project Gus Breese, Matt Clifford, Charlie Coombes and Mark Fitzsimmons were given the brief to understand the spin of the ball during table tennis rallies. Not only did they get to the bottom of the physics, but they filmed members of the University table tennis team in ultra slow-mo and built a computer simulation. The videos at which can be found at www.youtube.com/watch?v=wJqB4ajYs and www.youtube.com/watch?v=Ijy7N31rks0

Their videos captured the interest of a professional table tennis website, that is planning to use their analysis with the England Table Tennis no 1 in order to explain the effects of spin to an international audience.

Dr Helmut Hauser

Spiders are truly amazing creatures. Nobody so far has looked into the actual computational capabilities of the spider webs. Helmut recently started a Leverhulme Trust Research project that will use naturally spun spider webs computing to develop sensor technology based on morphological computation. His E-book on Morphological Computation is at www.morphologicalcomputation.org/e-book/

Dr Rosalyn Moran

Rosalyn has recently joined our Department from Virginia Tech. She wants to understand how we learn, how our brains age and how parts of the brain interact when facing diseases. Her research combines imaging, modelling and artificial intelligence to map the brain, “the most fascinating electrical device,” as she says.

Other news

In memoriam: Dr Gordon Reece, an influential and colourful figure who made lasting contributions to our Department, to engineering education and University life.

Prof Eddie Wilson has been invited to join the Mayor of Bristol’s traffic congestion task group.