

Engineering Update

December 2009

This has been a particularly busy term for Engineering activities at Newstead encouraging us to issue this update a month earlier than in previous years.

The Engineering Diploma has been a key driver towards this increased activity with diploma students being involved in a range of events to promote the qualification at national events. This work will continue in February next year when Diploma students will be talking about their experiences and enthusiasm for the higher and advanced courses at the Engineering Schools National Conference in Sheffield.

Access to professional engineering environments is essential to aid an understanding of the wealth of opportunities available to engineers in their profession. This term students have had the opportunity to attend lectures and events at professional institutions, attend an engineering at work event as well as visiting engineering companies. We thank all of the organisations and individuals that have helped make this possible.

Jenny Wright: Head of Engineering

BLOODHOUND SSC – THE 1000 MPH SUPERSONIC CAR

The London headquarters of the Institution of Engineering and Technology was the prestigious venue for a recent lecture on the Bloodhound Supersonic Car (SSC) project attended by 27 Newstead students from years 10, 11 and 12.



Wg Cdr Andy Green

This project aims to push the boundaries of technology by building the world's first 1000 mph car, with the wider aim of generating interest in Engineering as a future career option.

The car is built around a state-of-the-art Eurojet EJ200 jet engine (as used in the Typhoon fighter jet) and a purpose built Falcon hybrid rocket, which together are capable of providing 210 kN of thrust.

The lecture was co-presented by Wing Commander Andy Green, who faces the daunting task of driving the vehicle, and Dr John Davis the engineer responsible for designing and implementing the car's complex control systems.



Bloodhound SSC

More information on this inspirational project can be found at www.bloodhoundssc.com.

IN THIS EDITION



STUDENTS PRESENT
AT PARLIAMENT



WISE AWARD FOR
NEWSTEAD STUDENT



ARKWRIGHT
SCHOLARS SUCCESS



MUNICH WELCOMES
NEWSTEAD STUDENTS



SHELL ECO-MARATHON
UPDATE

AND MORE...

WESTMINSTER WELCOMES DIPLOMA STUDENTS

Engineering Diploma students from Newstead recently exhibited their work in Parliament at an event organised by the Institution of Engineering and Technology (IET). Guests included MPs from across the political spectrum, including local MP John Horam, together with leading individuals from industry.

Nigel Fine, the IET's Chief Executive added: "It is evident from talking with the students how beneficial the Engineering Diploma is becoming; I am most impressed by their ability and enthusiasm."



At a separate event, Victoria Luck joined the panel at the Westminster Education Forum Seminar: Diplomas & Apprenticeships, where she presented her thoughts and opinions on the diploma alongside a head teacher, university admissions tutor, MP and employer champion.

Victoria impressed with her eloquence, maturity and confidence.

(l-r) Nigel Fine IET's Chief Executive, Sorcha Stokvis, Iain Wright MP Schools Minister, Lord Baker of Dorking, Victoria Luck, Phil Willis MP Chairman Commons Science & Technology Committee

AWARDS GALORE FOR NEWSTEAD'S FUTURE ENGINEERS

Arkwright Scholarships Awarded to Students

Winning an Arkwright scholarship is a great achievement and this year four Newstead students were successful in their applications – making this our most successful year to date regarding the award of scholarships.

Out of the 770 applicants for the scholarship, Newstead's Supriya Gopinath, Rachel Lee-Warren, Corina Thomas and Lily Webb were amongst only 36 girls from state schools to receive an award.

Details on applying for a scholarship can be found at www.newsteadmoodle.com.



(Clockwise from top)
Lily Webb, Corina Thomas, Rachel Lee-Warren and Supriya Gopinath received their Arkwright Scholarships in October

Student Receives WISE Leadership Award

The Women in Science and Engineering (WISE) Leaders Award challenges female pupils to interview female scientists, technologists, engineers and mathematicians about what first excited them about their subject, and how they harnessed this excitement to further their careers.

To qualify for the Advanced award, Newstead year 12 student Supriya Gopinath interviewed Kamlah Kew, a Principal Traffic Control Engineer working for Transport for London.

Her Royal Highness the Princess Royal presented Supriya with her award at the prestigious WISE Awards event held at the Royal Academy of Engineering on November 12th.

More information on the award as well as a full transcript and video of Supriya's interview can be found at www.leadersaward.com/index.php.



Supriya Gopinath receives her award from HRH the Princess Royal

PROFILE OF A SYSTEMS ENGINEER

By Supriya Gopinath



Kamlah Kew, TfL

As a Traffic Control Engineer for Transport for London, Kamlah Kew works with local authorities to come up with schemes for their roads and helps to manage traffic by installing junction controllers and pedestrian crossings within London boroughs.

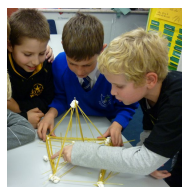
She pursued Physics, Maths, Chemistry and Art for her A-Levels and came to realise that her passion for creativity and her eagerness to "solve the needs of society" foretold her a career in Engineering.

Although her job requires a real skill for negotiating and liaising (as she has to cater to the needs of the thousands of Londoners), she loves that she directly aids the betterment of society and wishes to motivate more young woman towards careers in Engineering, "It's all about spreading awareness about the options."

ENGINEERING SOCIETY SUPPORTS LOCAL PRIMARY SCHOOL

The Newstead Engineering Society continues to run their weekly engineering club for Year 5 and 6 children at Tubbenden Junior School.

Activities have included making towers out of paper and sellotape capable of supporting a given weight, making waterproof boats to hold as many Smarties as possible using a single sheet of paper and building towers out of spaghetti and marshmallows.



This year the club has gained in popularity, with 18 pupils from year 5 and 15 students from year 6 attending voluntarily after their normal school day. The children will also soon be working towards Crest Star Investigator awards.

"It's good fun, but can be pretty competitive"

Tubbenden Junior School Year 5 Pupil

Winners of the spaghetti-marshmallow towers

ENGINEERING VISITS ENLIGHTEN NEWSTEAD STUDENTS

Joint Engineering / Languages Trip to Munich

In October a group of ten year 10 students studying German and/or the Engineering Diploma visited Munich for 5 days. The aim of the trip was both to improve the students' German language skills and to enable them to experience some of the amazing feats of engineering that Munich has to offer.

The trip included several engineering related visits. The Deutches Museum, the world's largest science and technology museum, provided students with an opportunity to explore aeronautical and astronautical exhibits as well as exhibits promoting environmental engineering, including alternative energy.

Other highlights included the Audi and BMW museums where the students enjoyed viewing the concept cars, the Olympic stadium, Alliance Stadium and an exhibition on Sophie Scholl, opposer to the Third Reich during the Second World War.

The students also spent a day at a school in Starnberg, where they took part in a German engineering lesson, had a traditional German lunch and met their pen-pals. The trip was a huge success, with everyone having a fantastic time.



A German engineering lesson

Ironbridge

Year 9 students worked with enthusiasm and exhibited an infectious sense of adventure on their residential trip to Ironbridge in November. As in previous years the trip focussed on investigating the sites surrounding the famous Ironbridge near Telford, considered the birthplace of the industrial revolution.

As well as exploring the gorge and the bridge itself students discovered why the industrial revolution was centred in the area, how the iron was extracted and the manufacturing processes involved in casting the bridge during their visit to the Museum of Iron.

Pottery was also a key industry in the area due to the abundant supply of suitable minerals and this year for the first time the students were able to take part in workshops at Coalport China Museum, where they practised the art of transferring images onto ceramics. The girls designed and produced an intaglio print of the Ironbridge and then each produced a mug with traditional transfers on it.

A visit to Blists Hill, an authentic Victorian Town set on the site of an original foundry always proves popular and this year students had the opportunity to interact with an even wider range of traditional crafts people, shop keepers and workers.



Students design transfers for their mugs

UNIVERSITY LINK FACILITATES RAPID PROTOTYPING

Rapid prototyping is a manufacturing process that is widely used in industry, but which for most schools, including Newstead, is unavailable due to the high cost of machines and materials.

Recently, however, our Advanced Engineering Diploma students were given the opportunity to realise their designs in real life, due to support from Dr Mehmet Karamanoglu, Head of Product Design and Engineering at Middlesex University's School of Engineering and Information Sciences.

Using Autodesk Inventor 3D modelling software, students designed products to help people with limited finger movement to open ring pull cans.

Based upon stereolithography files created by the students, a 3D printer at Middlesex University was then used to manufacture the models in resin to a tolerance of 0.1 mm.

This activity has greatly enhanced our delivery of the Computer Aided Design unit of the Advanced Diploma and our thanks go to Dr Karamanoglu.

Rapid prototyped products designed by Advanced Diploma Students



ENGINEERING AT WORK EVENT HELD AT BROMLEY EDC

Thirty year 9 and 10 students from Newstead Wood School for Girls took on the role of safety specialists at this year's Engineering at Work event facilitated by Discovery4 in conjunction with Bromley Business Education Partnership. They were tasked with designing and creating a mechanism to protect an egg being thrown from a height.

Angella Kelly from Discovery4 started the day with an interesting introduction to career paths within the engineering industry.

This was followed by the Egg Crash Test Challenge, with students being assisted by engineering ambassadors.

The event finished with a look at the background of each of the ambassadors and further information on the different career choices available.

"I now see Engineering as fun and full of choice rather than viewing it as a difficult subject."

Newstead Year 9 Student

SHELL ECO-MARATHON BID MAKES PROGRESS

The Shell Eco-Marathon has proved to be a huge learning curve for all involved and has generated many problems we are striving to solve. The first was the matter of a budget. With no money and no idea of how to gain sponsorship, starting the project was slow, but we managed to procure £1000 fairly quickly through school and parental support. We also had the pleasure of meeting Mr Cliff Hardcastle, an experienced businessman and engineer who provided us with advice on our sponsorship materials. We would like to thank him for his donation of £1000, giving us a total of £2000 to date.

The team recently visited Trinity School, who have vast experience in this competition. We were presented with the chance to see their car and get important questions answered. Last year we also visited Langley Park Boys School and two students from the team had the privilege of accompanying them to last year's event.

These have all been valuable experiences providing us with ideas and a real understanding of the task ahead. We hope to maintain links with both schools and use the resources at Bromley College to further our progress.

Having toyed with many design ideas, materials and manufacturing techniques we are now finally ready to begin manufacture. Each person in the team has been allocated a role in the design and manufacture, such as steering, braking and engine transmission, though we are working as a team to design and build the chassis and outer shell.



Determining the vehicle floor pan layout

The Year 11 Eco-Marathon Team

FOCUS ON AN ALUMNA

Joanne Lambert was a founding member of the Engineering Society at Newstead. As a member of the class of 2005 she left school to read engineering at Cambridge University.



Joanne's initial Engineering interest was focussed around aeronautics and structures but she soon developed a passion for solving engineering problems in the developing world.

Joining the 'Engineers without borders UK' organisation centred at her university, Jo took up numerous opportunities throughout the four years of her MEng course to develop her experience. These included projects in Mozambique and Bhutan. In Bhutan, a tiny remote country bordering India and China, Jo investigated the issue of waste disposal, proposing waste management systems which would cope with the influx of imported goods from China to a previously self sufficient nation.

Jo is currently in Mozambique, working for the diocese of Niassa. Her work involves developing sustainable solutions to the 'lack of water' problem identified by 30 community groups in the diocese. In some cases the problem is because of a broken well or pump. In other cases people have been lazy and just not dug a well. In other cases, the ground is too rocky. Her role is to help the communities figure out how to respond to their individual problem, whatever the situation.



Jo with one of the communities she is working with in Mozambique

We would like to thank Jo for sharing her engineering experiences with Newstead students in assemblies at the beginning of December, a week before she set off on her latest adventure.

If you would like to find out more then visit Jo's blog at www.joanneinmozambique.blogspot.com.

IN BRIEF

Summer School

Gifted and Talented students from schools in Bromley found the range of activities provided at the Engineering Summer School in August challenging and inspirational. The theme of 'Flight: A Leonardo Question Answered' provided an insight into the engineering concepts behind aircraft ranging from models to real planes at the Imperial War Museum (Duxford). A visit to the University of Surrey included a tour of the Surrey Space Centre. Flight in nature was also explored. The summer school concluded with students' creative responses to these stimuli, including music, dance, poetry and art.

Balloon Debate

A group of students from the Engineering Society recently attended a balloon debate at the Institution of Mechanical Engineers in London. The session provided them with information on several different engineering careers such as civil, structural, mechanical and nuclear engineering, after which they were able to vote for which they considered the "best" profession. They were also given the opportunity to speak to professional engineers after the event.

Newstead and Hwa Chong visit Ramboll

Students from Newstead took their visitors from the Hwa Chong Institution, Singapore to the London offices of Ramboll Ltd, a multidisciplinary engineering consultancy. Here they found out more about the Engineering industry and careers and worked with graduates on a bridge building challenge.

Engineering Education Scheme

This year two teams of 5 students have embarked on the Engineering Education Scheme (EES). Working alongside engineers from Defence Science and Technology Laboratories (DSTL) the teams have been charged with designing "an environmentally and user friendly lighting system" and "an extendable lift with an overweight warning". Having already produced their initial designs the teams will be realising their solutions at the University of Kent from 16th to 18th December. We would like to thank DSTL for their continued support.

Budding Year 7 Engineers make Rudolfs

Twelve year 7 students have developed their knowledge of electronics and programming by building microcontroller based Rudolf Reindeer circuits in a lunchtime club this term. This festive product will play a range of Christmas tunes when various sensors are activated. We would like to thank Doja Odunowo, a year 12 student for her support with this club.

Newstead Students Test Their Eggs Factor

Project Eggs Factor is a challenge set by the Young Engineers organisation whereby students are required to design and build a system that allows the safe transport of two raw eggs across a chasm and up cliff faces. Five teams from year 8 have registered to participate.