



University
of Worcester

ISE update

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NEWS FROM THE UNIVERSITY OF WORCESTER'S
INSTITUTE OF SCIENCE AND THE ENVIRONMENT

Spring / Summer 2011

A black quadcopter drone with four propellers is shown in flight against a clear blue sky. The drone is positioned centrally in the lower half of the page, with its camera lens pointing downwards.

An eye
in the Sky...

An eye in the Sky...

Recently acquired by the Institute of Science and the Environment, the Draganflyer X6 will be used by students and researchers alike, to look at environmental, archaeological, geographical and ecological research from a whole new perspective.

The Draganflyer X6 is an unmanned aerial vehicle, capable of flying at 30mph. It is equipped with GPS, allowing images from a precise location to be captured, using a revolutionary aerial photography system that can take high definition video. A laptop link-up on the ground allows the user to see exactly what the on-board camera sees, getting the exact shots needed.

The technology is used in the main by the military. Aerial photographs can be obtained from locations ordinary manned helicopters could not reach letting us research environments we previously could not visit. The University of Worcester is the only university using this technology for environmental and ecological research. We aim to use this new technology to study river systems, landscapes, and archaeological sites. Dr Ian Maddock, Principal Lecturer in Physical Geography, said: "This piece of equipment will transform the way we carry out research into river science. It will replace the methods we currently use, that involve assessing the rivers subjectively by walking along the bank-side."

Piloting the aircraft requires specialist training and a license from the Civil Aviation Authority, which both Dr Maddock and physical geography technician James Atkins have recently completed. "The Draganflyer X6 is the ultimate environmental research tool," said James. "It is able to survey almost any terrain." Dr Maddock said: "We envisage use for other areas within the Institute of Science and the Environment, including aerial surveys of vegetation for applications in ecology and environmental management, dig sites in archaeology, and even sites of forensic interest. We also expect the equipment to be demonstrated to students in third year Geography." Third year students taking the Applied GIS and Remote Sensing module currently use a HeliKite. This unmanned aerial vehicle is a combination between a kite and a helium balloon, which can lift a remotely controlled digital SLR camera, which takes infrared photographs that are used to map vegetation and ground surface cover.



WELCOME



Welcome to the latest Institute Newsletter. While the contents speak for themselves, they do not explain that student recruitment data tells us that we are the fastest growing section of the fastest

growing University in the country. In 2010-11, student applications are so far 25% higher than last year. Why? I think the hard work of my colleagues in supporting students has been a major factor in attracting students. Other important factors are the University's commitment to engage with the region, an excellent record in graduate employability and the innovation the University is showing in the development of the Worcester Award, the new Library and the planned Worcester Arena. The effectiveness of our teaching was recognised last May when, in a very competitive process, we were allowed to increase recruitment of undergraduate students. This has led us to appoint four new members of academic staff strengthening both our course curricula and our research activities. The Institute was awarded a large amount of equipment funding during the year and colleagues have already integrated this into their teaching and research activities. Meanwhile, there have been tremendous developments in the Institute's National Pollen and Aerobiology Research Unit. The new Director (Prof. Roy Kennedy) has just appointed six new researchers who will make contributions to undergraduate and postgraduate courses. If you are applying to enter University next September, I wish you well and urge you to consider joining us and becoming part of the fastest growing university in the UK.

Professor John Newbury
Head of ISE

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Conservation in Action

First year students on the new Conservation Ecology BSc undertook four days of practical habitat management for the Worcestershire Wildlife Trust as part of a course-specific module entitled 'Practical Conservation'.

Conservation work within the UK normally involves some form of habitat manipulation to achieve the conservation objectives for particular sites. Such 'habitat management' can involve the recreation of traditional management practices such as coppicing, fencing to allow grazing of grassland sites or creation of ponds for wetland species.



Students undertook practical work on local nature reserves where they were taught basic practical conservation skills. The first two days of work saw the students removing invasive scrub from Windmill Hill SSSI nature reserve, noted for its rich flora, including five species of orchid. Here invasive scrub threatens to overwhelm these rare plants so it is necessary to remove scrub by hand. The Windmill Hill volunteer management team remarked "We are very impressed by the work the students have done, they cleared an enormous amount of the site - can we have them every month?"

A further two days were spent at one of the Worcester Wildlife Trust's flagship reserves, the 6000 year old Tiddesley Wood. Here students spent the first day widening a woodland ride which will encourage herbaceous growth and associated invertebrates, especially butterflies. On the second day they also erected a temporary deer fence around a new coppice to prevent deer browsing new growth.

For further details about the Conservation Ecology degree course please see the website, <http://www.worcester.ac.uk/courses/13178.html>

GUESS THE GRAIN!

Can you identify which species this pollen grain belongs to?



Turn to page 6 for the answer.

**You may have seen CSI Miami and CSI New York
...but have you seen**

CSI Worcester?

A brutal murder has taken place in a house on the edge of the University of Worcester campus.... But don't worry we have specialist students on hand to solve the case.

The Forensic and Applied Biology course now has a specially dedicated, large three bedroom semi detached scene house and gardens in which to set up a wide variety of crime scenarios. The course itself benefits from being taught in the main by Forensic experts and it is these members of the teaching team who are able to use their first hand knowledge to set up crime scenes for the students to investigate. The Crime Scene Investigation module, which is run in the second year of the course, is taught by a Police Crime Scene Manager who is now able to set up practical elements of the module allowing students the opportunity to put theory into practice and get firsthand experience of seizing, recording, photographing and examining evidence from crime scenes ranging from domestic burglaries to murder investigations in a real life environment.

Kate Unwin (Course Lead for the Forensic and Applied Biology Course and a Forensic Biologist) will be using the house with the new group of first year students set to arrive in September 2011 and preparations are underway on practical elements of the Introduction to Forensic Biology which can be delivered within the Crime Scene House.

In another of the specialist Forensic modules – Biological Indicators of Crime - the garden area of the house will be used by students to gain a practical understanding of what is meant by Blood Pattern Analysis and how it can help in serious assault and murder cases. In the third year of the course students have the opportunity to conduct a research project on a forensic topic of their choice. The crime scene house will give such students opportunity to carry out projects in the field of crime scene investigation.





These specialist facilities complement the strong practical element which spans throughout the Forensic and the core Biology modules. It also allows students to make the most of the specialist equipment the course has: for example the crime scene and UV searching lights, photographic and video recording equipment, crime scene kits, personal protective wear, evidence detection and recovery equipment.

"The scene house is an important feature of the forensic course as it gives a genuine setting for many types of crime scene. We (the students) never know what we are going to find there!"

Caroline Smyth Third year Forensic and Applied Biology student.

For further details about the Forensic and Applied Biology degree course please see the web site:

www.worcester.ac.uk/courses/2460.html or contact the course lead Kate Unwin on kate.unwin@worc.ac.uk.



The degree in Forensic and Applied Biology which has run for the last few years has recently received a major boost. The Forensic Science Society has now granted the course full accreditation. The course received special commendation and the Accreditation Panel were impressed by the encouragement provided to the specialist forensic practitioner staff to maintain the currency and cutting-edge of their disciplines. They said the considerable student support structures are commendable and are greatly appreciated by the students on the programme. They also praised the close integration of the high practical content with the theoretical component and the value and strength of the final year project. During their visit, the inspection team were shown the new 'crime scene house' on campus at which the course teachers are able to set up different crimes and train students in the practical skills of information gathering. Prospective applicants are advised to visit the Society's website at www.forensic-science-society.org.uk/home.

Something in the air

The Institute of Science and the Environment at Worcester University houses the National Pollen and Aerobiology Research Unit (NPARU).

NPARU is best known for its central role in producing the pollen forecast for hay fever sufferers during summer months but also collects data on airborne bacteria and fungal spores and additionally provides expert forensic advice for the investigation of major crimes. The Unit has also been involved in a range of research and commercial activities relating to pollen and allergy; these have included product testing and clinical trials. Because of the Unit's success in attracting research funding, Professor Roy Kennedy, NPARU's new Director, has just appointed a further six research scientists to positions within NPARU.

One of these, Dr Mahmut Tor, brings with him a prestigious Leverhulme Fellowship. This strong research grouping contributes teaching to specialised modules within the Institute and Dr Tor is currently developing a Masters degree in Aerobiology.

NPARU has seen some important changes over the last year. The research staff have been housed in a new custom-built suite of laboratories. The new facilities include a dedicated microbiology lab,

a dedicated forensics lab, a training room and a large new controlled environment facility. The controlled environment room offers particularly exciting possibilities because, in allowing the control of temperature, humidity and oxygen levels, it can effectively mimic environmental conditions in any part of the world. This new building also houses the new undergraduate teaching lab with state of the art facilities for students taking BSc in Biology, Nutrition, Animal Biology, Human Biology and Forensic and Applied Biology.

Guess the Grain? This pollen grain is from a narrow leaf evening primrose or *Oenothera fruticosa*.



Bee part of it!

The Institute has been collaborating with the National Trust and Local Radio stations in a national programme called 'Bee part of it!'. The project has raised awareness of the vital role bees play in pollination and explained some of the threats that they face. To help tackle the problem the NT introduced 45 new honey bee colonies at locations around the country. Every hive has been adopted by a BBC Local Radio station. Scientists at the University of Worcester have been collecting samples from some of these hives and analysing these to find out what flower species the bees have been visiting. The pollen in the samples has been identified by international experts in the National Pollen and Aerobiology Research Unit. This has allowed the development of a database detailing the plants that bees from the different hives visited during the year. The process has fascinated beekeepers and Prof. Newbury has so far given almost 30 interviews to different local radio stations about the project. However, there is also a serious scientific question to be addressed. Does it matter that 75% of the pollen in some of the honey samples was from oil seed rape? Will this have any effect on the nutrition of the bees? Further results will be obtained next spring when the key questions

will be whether there is any association between the previous diet of the bee colonies and their ability to survive the winter.



Bronze Age Britain...

Archaeology students from the University of Worcester have been working with the Leintwardine History Society to excavate the largest hoard of Bronze Age spearheads ever found in Britain.

The site, near Leintwardine in Shropshire, has remained largely untouched since the 1860s when the discovery was first made by workmen installing drainage pipes.

Dr Jodie Lewis, Course Leader in Archaeology at the University and an expert in the Neolithic and Bronze Age periods, said: "Despite this being one of the largest hoards of Bronze Age spearheads found in Britain, little work has been carried out."

The group opened several trenches including one over a large mound in an adjacent field. They uncovered a number of pieces of flint dating back to around 6,000BC. Using specialist mapping equipment students also discovered what appears to be a Late Bronze Age high status settlement.

Dr Lewis said: "During the Later Bronze Age, around 800BC, it seems that the site where the metalwork hoard was placed was a marsh – at this time deposition of metalwork in water is known throughout Europe and seems to have been some kind of ritual act".

The artefacts found will now be analysed and will eventually end up in a local museum. Dr Lewis said: "We will be analysing all our findings but we will have to go back to the 'settlement' site and monitor things and complete topographical surveys of the location."

For further details about studying Archaeology at the University of Worcester please see the website www.worc.ac.uk/departments/14381.html or contact the course lead Jodie Lewis on jodie.lewis@worc.ac.uk.



Biology students get up close and personal with a variety of reptiles and amphibians as part of a core first year module, **Biological Diversity**.



The reptiles and amphibians were brought in by Mike Burt, also known as the Lizard Man, who visited the University with a number of creatures from his local Worcester Reptiles shop, including a Milk Snake, Yemen Chameleon, Leopard Geckos, Crested Geckos and a Monitor Lizard.

Senior Lecturer Dr Mike Wheeler said: "This was to investigate reptilian and amphibian features compared to other animals. Bringing the animals in rather than just having pictures on a slide is a great way to engage students and enhances their learning." The big spectacle, a five-year-old Monitor Lizard, was brought in last and students were given the opportunity to hold the enormous lizard. Student Chris Banks, 23, said: "The Monitor Lizard is very nice. It is heavy, really heavy."



For further details about the Biology degree course please see the website www.worcester.ac.uk/courses/665.html

In deep Water!



A lecturer from the University of Worcester has been conducting vital research to help preserve endangered fish in Slovenia.

Dr Ian Maddock, Principal Lecturer in Physical Geography in the Institute of Science and the Environment and Dr Nataša Smolar-Žvanut, from the Institute for Water in Slovenia, have been investigating water flow on the Soca River.

Not only is the Soca a world renowned kayaking destination but it is one of the last homes of the native Marble Trout, now an endangered species which breeds only in fast flowing water. However, due to the presence of dams and pipelines for hydropower, some stretches experience large reductions in water flow. Ian and Nataša intend to provide recommendations to the hydropower company after reviewing how conditions can be altered to improve the water quality for endangered fish species.

Dr Maddock said: "Our fieldwork included navigating several kilometres of river in a small boat on the first day to identify suitable sites for more intensive data collection, then completing three days of measurements in short reaches taking hundreds of measurements of water depth, velocity and river bed material size. Not a simple task wearing waders all day in 36 degree heat!" He added: "The hydropower company provided different water levels for us each day in order to collect data at the same places but under different hydraulic conditions. Data analysis and computer modelling will then enable us to examine the full impacts of river regulation on the hydraulics and ecology of the river. It also provides firsthand experience of a common river management challenge, where rivers are regulated by dams and reservoirs. This is an issue we refer to and explore in more detail in lectures and practicals with our students studying on our Physical Geography and Environmental Management degree courses."

For further details about the Geography degree courses offered at the University of Worcester please see the website <http://www.worcester.ac.uk/departments/14438.html> or contact admissions on admissions@worc.ac.uk.

COME AND VISIT US

For more information about our Visit Days, or applying for a course at the University of Worcester, please contact our Admissions team on: admissions@worc.ac.uk or 01905 855111

www.worcester.ac.uk

