

Tauranga students monitor effects of Rena pollution



Marine work: Katikati College Year 12 students Alex Junger, left, and Jason Palmer, check through samples while at the University of Waikato Coastal Marine Field Station during the school holidays.

The University of Waikato's Coastal Marine Field Station at Sulphur Point recently gave secondary student volunteers the chance to learn first-hand how they operate.

In the April school holidays, eight Year 12 and 13 students from Katikati and Mount Maunganui colleges visited the Field Station to work with staff.

The students helped collect and sort core sediment samples from the seabed around Sulphur Point and then examined them through a powerful microscope, revealing minute living creatures within the samples. This kind of work has been the backbone of the Field Station's efforts to monitor effects on local marine life

from the Rena grounding in 2011.

Katikati College Science teacher Mat Kindley was there supporting his students and had high praise for the University's Field Station staff and facilities. "We don't get many opportunities to see what universities are doing."

With several of his students already imagining themselves pursuing a career in marine science, Mr Kindley is now looking into other ways he can involve his students in Field Station activities throughout the year.

Contact Tauranga Student Recruitment Advisor Andy Howells andyh@waikato.ac.nz for further opportunities in the Bay of Plenty.

\$5000 for MSc

Waikato biology student Alex Keyte Beattie has won the Dr Stella Frances Scholarship worth \$5000.

The scholarship is funded by the Waikato Regional Council and the Department of Conservation and will enable Alex to work on her masters research to better understand the unique Kopuatai Peat Dome in the Hauraki Plains.

The results of her work will be applied to the preservation and restoration of the peat dome, as well as other wetland sites around the region.

"My thesis aims to combine a variety of methods to address a lack of research into the link between the properties of Kopuatai bog's vegetation canopy and its moisture and carbon budgets."

Waikato Conservation Board chair Arthur Hinds says, "Alex has an outstanding academic record which clearly demonstrates her passion and commitment for the environment."



Entries open soon for Science Summer School

Applications for the 2013 Hill Laboratories Waikato Science Summer School will open from 24 June.

The Summer School is open to Year 12 students within Rotary District 9930, who have an interest in science, and who will be going on to study at Year 13 level in 2014.

Attendees experience real-life science and engineering both out in the field collecting samples and within Waikato University's labs, experimenting with the University's state-of-the-art equipment.

Applications must be lodged through your local Rotary Club. Participants will be chosen based on high academic achievement, intention to

pursue science as a career, a well-rounded personality, a good attitude and work habits, and wide community interests.

Details will be sent to secondary schools in Rotary District 9930 and will be available online from 24 June.

www.sci.waikato.ac.nz/sciencesummerschool

Waikato grads popular at MB Century

Geothermal energy is said to be the power source of the future and Waikato graduates Holly Goddard and Ben Knyvett are making the most of their opportunity to learn as much as they can about this rapidly expanding industry.

Holly and Ben work for MB Century, a company which completes geothermal investigation and development work throughout the North Island. While Holly studied Earth Sciences at Waikato, Ben studied Materials & Process Engineering, landing them in very different roles within the company.



Holly Goddard
Degree: Bachelor of Science (Earth Sciences)
Job: Geothermal Monitoring Technician

As a Geothermal Monitoring Technician, Holly spends a lot of time out in the field learning about the electricity generation process, and how geothermal energy is harnessed.

"My job is to monitor groundwater levels, conduct temperature profiles, monitor steam field production and reinjection chemistry, undertake flow testing on geothermal steam pipes and complete stream, spring, river and geothermal feature sampling. All of this work is vital to maintaining the geothermal industry," says Holly.

Holly says her masters enabled her to develop self-learning skills which have been invaluable in her job when problems or new challenges arise.

During her masters study she won an Antarctica New Zealand Scholarship which funded a trip to Antarctica to work on her research. In addition she travelled to Russia to present her research findings at a conference and worked on the search for the Pink and White Terraces in Rotorua.

"Your degree is what you make it. Take every chance and opportunity you are given and it could take you anywhere."

Find out more: www.sci.waikato.ac.nz/study/student-profiles

Ben Knyvett
Degree: Bachelor of Engineering (Honours), Mechanical Engineering
Job: Mechanical Engineer

Ben is a mechanical engineer and spends his time designing the steam pipelines and equipment for new and existing geothermal power plant projects.

"Increasing the power production capacity of these plants means that we can displace other forms of power production that have greater negative effects on the environment. Virtually all the projects I work on are related in some way to increasing the country's geothermal power output."

Ben spends the majority of his day completing design work and managing projects, with the occasional trip out to a site to check on the construction and make adjustments to the design.

"It's very creative. There are countless possibilities when designing a pipeline or piece of equipment from scratch."

As a student at Katikati College, Ben took



chemistry, physics and calculus in Year 13 to ensure he was ready for tertiary study in engineering.

Along with developing his technical skills, his job has also allowed for him to work on his social and time management skills.

"You need to be able to work well in a team, as there are numerous people involved in design projects. It's a very social environment. Dealing with several projects at a time can be very challenging, but also extremely satisfying."

Ben Knyvett's profile was provided courtesy of Futureintech www.futureintech.org.nz

Register now for Science & Engineering Open Days

Spend the day on campus with staff and students and experience hands-on workshops and lab demonstrations.

Both full-day events are suitable for Year 11, 12 and 13 school students, as well as adult learners.

Attend just one event or register your interest for both. Numbers are limited, so register your place now!

Registrations close: 5 July 2013

Register online now at www.sci.waikato.ac.nz



Engineering Open Day
Thursday 18 July 2013

Covers: The Bachelor of Engineering (Honours) degree, including the programmes of electronic engineering, software engineering, chemical & biological engineering, materials & process engineering and mechanical engineering.



Science Open Day
Friday 19 July 2013

Covers: The Bachelor of Science and the Bachelor of Science(Technology), including the majors of biological sciences, chemistry, physics and earth & ocean sciences.

Scholarship takes maths student to Germany

University of Waikato student Jordan McMahon is soon off to study at the University of Bonn, in Germany.

He's a recipient of the William Georgetti Scholarship, worth \$23,000 per year. The purpose of the William Georgetti Scholarship is to encourage postgraduate study and research in a field that is important to the social, cultural or economic development of New Zealand.

Jordan's currently finishing his Honours degree in mathematics and will leave for Bonn to begin his Masters and PhD in October.

The Georgetti Scholarship isn't the only big scholarship Jordan's won. Last year he was named as one of nine recipients of a 2012 Rutherford Foundation award, worth \$25,000 per year as well as up to \$7,500 towards course fees for up to a maximum of three years.

The Rutherford Foundation Trust only awards scholarships to New Zealand's most outstanding emerging researchers.

"Ever since primary school, I've always had an interest in maths and wanted to be a mathematician," says Jordan. "It's one of the purest fields of study."

Imagine cup victories



From left: Ersin Buckley, business mentor Mrs Lyndal Stewart, team leader Brian Cole, and Marcel Beetz. Photo - Louise Hutt Photography

Two University of Waikato teams entered in the Microsoft Imagine Cup have come away with category wins.

The Microsoft Imagine Cup, the world's largest technology competition, invites tertiary students from around the globe to create software using Microsoft applications to find real solutions to real-world problems.

The New Zealand final took place in Auckland from 23-25 March.

The *My Storyteller* team of Brian Cole, Ersin Buckley, Marcel Beetz and Shawnee Kitson came out victorious, winning first place in the Innovation category and taking away \$6000 in prize money.

The *My Storyteller* app for Windows 8 lets parents pre-record stories as videos, so they can 'read to' their children even while at work or travelling. Customisable stories are provided by the application, and parents are given 'karaoke style' prompts to read while recording. Children can read along on-screen as the video is played back to them.

From here the team are going to launch a social media campaign to pitch their idea to the world, and hopefully secure a spot at the Imagine Cup world final in Russia this July.

Fellow University of Waikato team APPortunists came second in the World Citizenship category, taking \$2000 in prize money.

Biological Sciences

Study Biological Sciences at Waikato and begin your adventure on a lifelong journey of learning. Whether you enjoy solving problems in a laboratory or working outdoors, our degrees are hands-on from day one.

Which degrees include Biological Sciences as a major?

You can study Biological Sciences as a major in the Bachelor of Science or Bachelor of Science(Technology). Biological Sciences can also be taken as a second major or supporting subject within most degrees at Waikato University.

What subjects do I need to study at school?

As well as biology, you will find chemistry and mathematics useful. If you have no credits in NCEA Level 3 Biology you are advised to discuss your options with the Faculty of Science & Engineering's Biological Sciences first-year student mentor.

What type of papers can I expect to take in my first year?

During your first year of full-time study you will take a selection of eight papers. To major in Biological Sciences this must include the two 100 level Biological Sciences papers. These papers cover topics such as cellular and molecular biology, genetics, cell function and the biology of organisms.

What about papers in my second year and beyond?

From year two you have the opportunity to branch off into your area of interest. Papers cover a range of topics such as evolution, genetics, ecology, plant biology, aquaculture, flora of Aotearoa/ New Zealand, animal biology, microbiology, biochemistry, freshwater ecology, marine biology, animal behaviour and zoology.

How can I find out more about Biological Sciences at Waikato?

If you would like to try out some hands-on experiments in the University labs, make sure you're registered for Waikato Experience Biology Days (4-5 June) and/or Science Open Day (19 July). See the back page of this newsletter for further details on both events.

Grab a copy of the new Biological Sciences booklet

Check out the new Biological Sciences brochure, which outlines in more detail the study options available. Download the brochure from www.sci.waikato.ac.nz/about-us/biological-sciences or request a hard copy via science@waikato.ac.nz

Career Opportunities

MARINE BIOLOGIST

FRESHWATER SCIENTIST

FORENSIC SCIENTIST

BOTANIST

RESTORATION ECOLOGIST

ANIMAL WELFARE OFFICER

Student profile: Ashley Webby



Former Hillcrest High School student Ashley Webby chose Waikato because it was close to home and had an excellent range of papers, taught by enthusiastic lecturers.

Ashley began her study with a Bachelor of Science (Technology) majoring in Biological Sciences, with specialisations in plant physiology and ecology.

She describes the highlight of her undergraduate study as her work placements, which included working two summers at Waikato University as a research assistant and work experience at Otorohanga Kiwi House.

"I absolutely loved my placement at the Otorohanga Kiwi House, where I was a keeper and raised eight baby kiwi chicks."

Now in the middle of a Master of Science, Ashley is looking into the toxicity of Rena pollutants to New Zealand fish and shellfish.

Graduate profile: Jonathan Brown



Waikato graduate Jonathan Brown is enjoying his role as a Resource Management Planner for global engineering, architecture, planning and property management consultancy, Opus.

The former St John's College student's job involves assessing resource consent applications to determine whether steps are in place to protect the environment from the potentially harmful effects of development.

"The good thing about being a planner is that while although most days you are either assessing or applying for a resource consent, no consent is ever the same. Whether it's the scale of activity, location, or district plan requirements, you are always learning."

Jonathan completed a Bachelor of Science, majoring in Biological Sciences and Earth Sciences, focusing on freshwater and terrestrial ecology.

Jonathan Brown's profile was provided courtesy of Futureintech www.futureintech.org.nz

Mining careers with Newmont

Two Waikato graduates are working their way through the ranks of Newmont Mining Corporation. Both graduates began their journey at Newmont's Waihi Gold Mine, but since then their careers have taken them in very different directions.

Newmont Mining Corporation is primarily a gold producer, with significant assets or operations in the United States, Australia, Peru, Indonesia, Ghana, New Zealand and Mexico. Founded in 1921 Newmont is one of the world's largest gold producers, with headquarters in Colorado, and around 40,000 employees and contractors worldwide.

Samantha Muir

Degree: Bachelor of Science (Earth Sciences)

Job: Graduate Geologist

When Waikato graduate Samantha Muir moved to Western Australia to work in Newmont's Boddington Mine she was thrown in the deep end. Yet Samantha has thrived on the opportunity and is steadily making her mark in what has traditionally been a male-dominated industry.

"As an Ore Control Geologist I work alongside the technical mine services team. Our job is to ensure the day-to-day mine operations run smoothly to achieve the highest ore recovery possible.

"My role involves preparing maps for our technicians and geologists. The technicians use the maps to get chip samples from our blast holes to analyse for gold grades. Geologists like myself use the maps to complete lithology mapping through Boddington's two open cut pits. I use the data collected from these activities in a 3D modelling program for various interpretations and visualisations. After an area has been blasted in the pit the geology team and I are responsible for marking out boundaries between ore and waste and ensuring excavator operators are aware of what they are digging."

Samantha is a firm believer in creating her own opportunities and it was through a summer holiday programme at Newmont Waihi that she got her break. Following the programme she was offered part-time work while she finished her degree, which turned into a permanent full-time position in the company's two year graduate programme. Due to a restructure Samantha only spent three of the planned 12 months in Waihi, instead being transferred to Western Australia to Newmont's Boddington Mine.



Jacob Croall

Degrees: Bachelor of Science (Environmental Sciences), Master of Science (Geochemistry)

Job: Manager: Global Water Treatment

Jacob Croall has travelled the world learning new ways to solve Newmont's water problems.

He works as the manager of global water treatment for Newmont in Colorado, USA. Here his main tasks include supporting projects and operations in all areas that relate to water; in particular developing treatment systems for process and contact water that comes from the mines.

He says that water is becoming an increasingly important factor for the mining business and there is pressure on compliance criteria from regulators, coupled with increasingly complex ores and processing requirements, and operations that are coming on-line in increasingly challenging locations.

In Jacob's first position with Newmont in Waihi, he worked as a plant metallurgist for three years, before progressing to the position of senior metallurgist. After five years at Newmont Waihi he transferred to Denver, Colorado to take up a position as an environmental process development scientist. After two years in the US he was appointed Manager: Global Water Treatment.

"While at Waikato University my training equipped me with the tools I needed to succeed in the mining industry. The courses were hands on, specific, and relevant, and gave me a solid foundation to build on when I began working. I left Waikato with a good approach to problem solving, real world experience, solid analytical and report writing skills, and a good technical base."

Scholarships for school leavers

Faculty of Science & Engineering scholarship winners were congratulated in March with a celebration lunch. Around 75 students attended of the nearly 130 who were awarded scholarships.

Science and Engineering Admission Fees Scholarships of up to \$4000 were awarded to 26 first-year students. Winners were selected based on high academic calibre in NCEA Level 3, leadership potential and involvement in sporting and community activities.

Scholarships were also won by 64 first-year students for their academic success in Year 13. Within the Faculty of Science & Engineering there were 13 Vice-Chancellor's Academic Excellence School Leaver Scholarships of



Bachelor of Engineering Fees Scholarship winners.

\$5000 awarded, along with 51 University of Waikato Merit School Leaver Scholarships of \$3000 each.

Other awards included University of Waikato Sir Edmund Hillary Scholarships and the Tess Embling Memorial Scholarship, which was won by biology student Laura Hines. The Tess Embling Scholarship was established to commemorate the spirited life and achievements of former Waikato science student Tess Embling.

Masters and doctoral scholarships were also celebrated at the event.

Find out more: www.sci.waikato.ac.nz/study/scholarships



Science Admission Fees Scholarship winners.



Vice-Chancellor's Academic Excellence School Leaver Scholarship winners.



University of Waikato Sir Edmund Hillary Scholarship winners.



University of Waikato Merit School Leaver Scholarship winners.



Laura Hines: Tess Embling Memorial Scholarship winner.

Computer Science

Computer scientists look at ways to systematically describe and transform information. Studying Computer Science at Waikato you'll learn about software systems and how people and computers interact, how to create new software, how to ensure it works well and does what it is supposed to, and how to make it easy for people to use.

Which degrees include Computer Science as a major?

You can study Computer Science as a major within a Bachelor of Computing and Mathematical Sciences, Bachelor of Science or Bachelor of Science (Technology). Computer Science can also be taken as a second major or supporting subject within most Waikato degrees.

What subjects do I need to study at school?

While there are no specific subjects you need to study at secondary school to study Computer Science at Waikato, NCEA Computing/Digital Technologies and Mathematics are very useful. Each year the Faculty also award up to 10 scholarships to the best performing secondary school students, as determined by our yearly Scholarship exams.

What type of papers can I expect to take in my first year?

During your first year you will complete a selection of introductory papers. Content covers basic computing operations, operating software packages for the manipulation of visual images, and sound and text for use in screen-based applications and animations. You will also learn basic computer programming and a variety of computer science concepts which will set you up for future papers.

What about papers in my second year and beyond?

From year two you can specialise in the following areas: applied computing, artificial intelligence, computer technology, data mining, games and multimedia, information systems, interaction design, internet applications, networks and software development. While there are core compulsory papers, there are also many optional papers offered to suit the interests of the individual.



Gabe Young
Job: Software and Development Engineer
Company: Microsoft, USA

Gabe completed his BCMS (First Class Honours) in 2011 and went to work at Microsoft HQ in Seattle, USA.

"It's an awesome place – I've learnt a lot and met some great people," says Gabe.

"After Microsoft I would like to get into some start-up work and come up with some really cool ideas."

While Gabe was still a student he did an internship for Google in Sydney.

"The internship was a really good way to put the skills I'd learnt into practice and it validated that Waikato was teaching me the right stuff."

Gabe spent three years in the halls and loved every minute. He paid his rent by taking a senior residential assistant position in the halls.

"It was an awesome experience and I took heaps away from my time there. The halls are definitely a great place to stay; you'll make lifelong friends and make some good memories."



Carly Hona
Degree: Bachelor of Computing & Mathematical Sciences
School: Tauranga Girls' College

After leaving school Carly spent four years travelling around New Zealand and Australia working in "mundane" jobs she hated. When she turned 21, Carly decided

Waikato University and mathematics was a good place to start tertiary study, since she had enjoyed maths at school.

To Carly's surprise the compulsory computer science paper she had to do in her first semester was an "absolute blast" and she "aced it" and switched her major to Computer Science.

"I can't believe how many doors have opened for me since I started my degree," says Carly. "There's a constant flow of opportunities for students in employment, various scholarships, even overseas trips, and the support you get from your tutors, lecturers and peers is second to none."

"Just starting with a broad range of papers can give you valuable insight into what it's like to study at tertiary level and what different career paths may interest you. Just like me, you may end up doing something you never thought you were capable of. I've managed to line myself up for a career in something I'd never considered before starting uni and it's exciting to think where I'll be in a few years' time."



Career Opportunities

COMPUTER ANIMATION

MULTIMEDIA CONTENT CREATOR

NETWORK ENGINEER

PROGRAMMER

SYSTEMS DESIGNER

USABILITY ENGINEER

WEB ARCHITECT

SOFTWARE DEVELOPER

IT CONSULTANT

Get into it: volunteering

Volunteering while at school is the perfect way to find out if you're heading along the right track career-wise, while helping your community at the same time.

As a volunteer you will develop experience and new skills which will be invaluable for your CV. General skills might include working with others and dealing with stressful situations, while a specific skill might be learning about the restoration of your local parks.

You will also be able to experience the positive and negative parts of a job, ask lots of questions about how others enjoy the job, and meet people who work in the industry, who will be useful contacts if you choose to pursue this type of career.

Almost every major centre in the North Island has an organisation which matches volunteers to the groups that need them. Volunteering Waikato recently advertised volunteering positions in the areas of conservation and restoration support, stream care, dog walking and horse riding.

Contact your local volunteering coordinators

www.volunteeringauckland.org.nz
www.volunteeringwaikato.org.nz
www.volunteerwbop.com
volunteertaupo@waiorahouse.org.nz
www.gisbornevolunteercentre.org.nz
www.volunteeringhb.org.nz
www.volunteeringnewplymouth.org.nz
www.volunteerwhanganui.org.nz



Work placements

At tertiary level it becomes even more important to gain experience in the industry you hope to one day work in.



At the University of Waikato, work placements are offered as part of the Bachelor of Science (Technology) and the Bachelor of Engineering (Honours).

Both four-year undergraduate degrees include six to twelve months work experience, which usually consists of a three month placement at the end of your second year and a further three or six month placement at the end of your third year.

Work placements at Waikato gain you course credit, valuable experience and are almost always paid positions.

The University has specialised staff whose job it is to work with industry, research institutes and local government organisations to place you in work that is relevant to your qualification and interests.

Part of your study also includes taught courses that cover professional behaviour, ethics, and communication, so you're prepared for the workplace before you enter it.

Find out more: www.sci.waikato.ac.nz/study/work-placements

What's on

4-5 JUNE 2013

Waikato Experience Biology Days

Year 13 Biology students and teachers are invited to attend seminars and lab work covering topics such as DNA technology, human evolution, biotechnology, and animal behaviour/plant responses to the environment.

Visit www.sci.waikato.ac.nz/webdays

6-7 JUNE 2013

Osborne Physics and Engineering Days

Talks and practical demonstrations focus on applications of physics, and provide students with examples of how the physics they are learning at school can be used in real life.

Visit www.sci.waikato.ac.nz/opsendays

12 JUNE 2013

NZIC Analytical Chemistry Competition

Teams of Year 13 students are set an analytical task, requiring accurate and careful analysis of an unknown substance.

Visit www.sci.waikato.ac.nz/chemcomp

24 JUNE 2013

Hill Laboratories Waikato Science Summer School applications open

Visit www.sci.waikato.ac.nz/sciencesummerschool

18 JULY 2013

Engineering Open Day

Spend the day on campus with staff and students, experiencing engineering through hands-on workshops.

Visit www.sci.waikato.ac.nz/engopenday

19 JULY 2013

Science Open Day

This event offers students and their parents the chance to explore the areas of science available to study at Waikato University through hands-on workshops.

Visit www.sci.waikato.ac.nz/scienceopenday

Contact us

Science & Engineering

Phone +64 7 838 4625

Fax +64 7 838 4218

Email science@waikato.ac.nz

Toll free 0800 438 254

www.sci.waikato.ac.nz

Computing & Mathematical Sciences

Phone +64 7 838 4322

Fax +64 7 838 4155

Email cms@waikato.ac.nz

www.cms.waikato.ac.nz



www.facebook.com/WaikatoScienceEngineering



<http://bit.ly/14qRoUk>