

UNE GRASS / 2018

Teacher Professional Development



Welcome to the 2018 UNE GRASS Teacher Professional Development Event

Sessions included in our program are designed to support the content from the secondary science syllabus, provide professional development supporting secondary science education and present smart science, smart living and the science feeding the world and saving the planet.

Presentations included in this event are offered by internationally recognised scientists outlining topical and cutting edge science, and key leaders in secondary science education.

une
University of
New England

GRASS
Growing Regional
and Agricultural
Students in Science





UNE GRASS 2018 / Teacher PD event

Session Times / Thursday 29 November



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TIME	WHAT	WHO	WHERE
8.00am – 8.15am	Registration	UNE GRASS Team	Agronomy & Soil Science building ground floor labs (W23_1.27&1.28)
8.30am – 8.40am	Welcome to Country and Official welcome to UNE	Mr Colin Ahoy, University Elder in residence and Mr Frank Leayr, School Manager, Environmental & Rural Science, UNE	Ecosystem Management building (W55_EM1)
8.40am – 10.00am	Key Note Presentation, Reimagining science education – implementing the new stage 6 science syllabuses	Dr Sham Nair, NSW Department of Education	Ecosystem Management building (W55_EM1)
10.10am – 10.40am	MORNING TEA		Courtyard of Ecosystem Management building (W55)
10.40am – 1.00pm	Concurrent depth study workshops		
	Chemistry	Ms. Kate Fittler, NEGS	Agronomy & Soil Science ground floor labs (W23_1.27)
	Biology	Ms. Yvette Ballard, PLC	Agronomy & Soil Science ground floor labs (W23_1.28)
	Physics	Ms. Suzie Feodoroff, St Mary's College	Ag Education Building collaborative teaching room (W77_1.120-1)
	Earth & Environmental Science	Ms. Mel Waters, Nambucca Heads High School	Ag Education Building Museum tutorial room (W77_1.120-2)
	Investigating Science	Mr. Matt Dodds, Science with Matt	Agronomy & Soil Science Building PBL meeting room (W23_2nd floor)
1.00pm – 1:45pm	LUNCH		Courtyard of Ecosystem Management building (W55)
2.00pm – 4.00pm	Concurrent workshops offering professional learning and investigation ideas relevant to NESA HSC syllabus		
	Biology	Dr. Mary McMillan, Prof Natkunam Ketheesan and Dr. Richard Charlesworth, UNE	McClymont (W34) Lab 3 and Lecture theatre 1
	Chemistry	Prof. Peter Lye & Dr. Michelle Taylor, UNE	Stokes Building (Co24_East Wing) and Seminar room, 3.07, Riggs Building C23
	Physics	Dr. Peter Fletcher, Dr. Stephen Bosi, Mr. Ron Bradbury and Dr. Mike Evans, UNE	McClymont (W34) Lab 1 and Lecture theatre 2
4.15pm – 5.00pm	Research insights	Oliver Knox, UNE, Dr. James O'Hanlon, UNE	Ecosystem Management building (W55_EM1)
6.00pm – 6:30pm	EVENING DINNER FUNCTION Guest speaker, Prof Karl Vernes, UNE <i>"Why do mammals use caves in Mexico's Yucatán Peninsula?"</i>		The Bistro, UNE

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Dr. Sham Nair	<p>Key Note presentation supporting implementation of new NESA Science syllabus</p> <p>After an exhaustive consultative process, NESA has released the new stage 6 science syllabuses for implementation in NSW schools. Five of the syllabuses were implemented in Term 1, 2018, while one syllabus will be implemented in Term 4, 2018.</p> <p>While the syllabuses contain structural changes, one important consideration is the provision of space and time for teachers to implement student-centred strategies in their practice. The inquiry-based approaches allow for students to be active participants in the learning and teaching process. In this Key Note presentation, Sham will describe how flexible, student-centred approaches can be used in the science classroom and will explore depth studies and the new science extension syllabus, as well as assessments and rubrics.</p>
CONCURRENT DEPTH STUDY WORKSHOPS	
<p>Chairing workshop:</p> <p>Chemistry – Kate Fittler Biology – Yvette Ballard Physics – Suzie Feodoroff Earth & Environmental – Mel Waters Investigating Science – Matt Dodds</p>	<p>Having now implemented Depth Studies and knowing how they have worked allows this opportunity for teachers to share what has worked well for yr 11 and ideas planned for yr 12.</p> <p>Teachers will be encouraged to share alongside the Depth Study concepts, the assessment approaches, student work samples, and effective resources.</p> <p>The last half of the workshop will be dedicated for teachers to work in small groups to select a Depth Study concept and develop/ refine an assessing/ marking rubric, supporting individual student driven work, while allowing consistent marking.</p>
CONCURRENT STAGE 6 SCIENCE WORKSHOPS	
<p>Dr. Mary McMillan Prof Natkunam Ketheesan and Dr. Richard Charlesworth</p>	<p>Biology</p> <p>The Body at War</p> <p>This workshop provides an update on the exiting progress in infectious and non-infectious diseases in the last few years. Using their own research and that of others, the coordinators will deliver short presentations giving the participants an insight into genetics, regenerative medicine and the immune system both in health and in disease. They will share ideas of possible student projects with examples and recipes for school activities to cover the contents of Modules 7 & 8 of the new Stage 6 Syllabus. A brief hands-on activity session is also planned to make the workshop more interactive.</p>
<p>Prof. Peter Lye and Dr. Michelle Taylor</p>	<p>Chemistry</p> <p>In this session Peter Lye and Michelle Taylor will provide an activity exploring Chemical Equilibria and Analysis of Organic Substances and as relevant to the NESA HSC syllabus and as detailed below:</p> <p>Chemical Equilibria: The teachers will determine the equilibrium constant, K_{eq}, for the formation of the iron (III) thiocyanate complex.</p> <p>Analysis of Organic Substances: Working through problems the teachers will identify simple organic compounds using ^{13}C-NMR, mass spectroscopy and infrared spectroscopy.</p>

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<p>Dr. Peter Fletcher Dr. Stephen Bosi Mr. Ron Bradbury and Dr. Mike Evans</p>	<p>Physics</p> <p>In this hands and minds on Physics session, teachers will have the opportunity to explore suites of novel hands-on learning activities focusing on key concepts that underpin the NSW Physics Syllabus:</p> <p>Module 1 – Kinematics Module 2 – Dynamics Module 3 – Waves and Thermodynamics Module 5 – Advanced Mechanics Module 6 – Electromagnetism Module 7 – The Nature of Light</p> <p>These activities can be adapted and used across both Year 7-10 Science to excite inquiring minds (non-senior-Physics teachers are encouraged to attend), and to support conceptual exploration in the new Year 11-12 Physics.</p> <p>Activities will be setup in stations, with each having an emphasis on: developing conceptual understanding, fostering working scientifically skills and linking concepts to other modules as a foundation for developing depth studies. Videos and documentation for all activities will be made available so you can share with other colleagues and your students.</p>
<p>Dr. Oliver Knox</p> <p>Dr. James O’Hanlon</p>	<p>Research Insights</p> <p>Carbon – can agriculture sequester it?</p> <p>Carbon is an important part of our ecosystem and a lot of it is in our soils. In soil, the organic carbon is involved in determining soil structure and health, but agricultural practices such as tillage and fallowing can result in its loss making our soils more prone to degradation. Halting this degradation is therefore key if we are to preserve our soils’ ability to grow enough crops to feed an ever growing world, but can we also put some carbon back into our agricultural soils? I’ll present some recent research on the fate of carbon in agricultural soils and propose some possible class experiments that can provide an insight into these observations.</p> <p>Ants: Engineers of the Forest</p> <p>Many plant seeds contain a fleshy ‘elaiosome’ that is a food reward for ants that carry the seed into their nests. This interaction (‘myrmecochory’), is a major driving force in the evolution of plants. A lesser-known fact is that certain stick-insects (Phasmatodea) use a similar dispersal strategy for their eggs. Ants collect stick insect eggs and feed on the lipid rich egg capitulum. My research explores the affect that ants have on both plants and stick insects. By understanding the incredible natural history of these tiny creatures I hope get an insight into how they shape the world around us.</p>
<p>Prof. Karl Vernes</p>	<p>Evening dinner function with guest speaker, “Why do mammals use caves in Mexico’s Yucatán Peninsula?”</p> <p>This research project examines the use of ‘cenotes’ (caves with water) by mammals in the jungles of Mexico’s Yucatán Peninsula, and how cave conditions such as physical dimensions, water quality, and cave climate affect usage. A range of mammals – including jaguars, pumas and margays – have been found to be using caves. It is hoped the work will assist in the conservation and management of these unique and vitally important water sources.</p>



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TIME	WHAT	WHO	WHERE
8.00am – 8.15am	Registration	UNE GRASS Team	Courtyard of Ecosystem Management building (W55)
8.30am – 10.00am	CONCURRENT INDUSTRY VISITS		
	ICT	Dr. Peter Cull, ICT	Starting in Ecosystem Management (W55_EM1) and moving to ICT
	Objective Live Animal Assessment	Dr. Todd Andrews, DPI	Starting at Wright Lecture Theatre (W48)
	Red Jewel	Mr Peter McCook, Red Jewel	Bus departing from AGSS carpark to travel to Red Jewel
10.00am – 10.30am	MORNING TEA		Courtyard of Ecosystem Management building (W55)
10.30am – 12.40pm	UNE Discovery	Dr. Kirsti Abbott, UNE Discovery	McClymont building Lab 1&4 and Lecture Theatre 1
12.40am – 1.00pm	UNE GRASS	Ms. Suz Greig, UNE GRASS	Ecosystem Management building (W55_EM1)
1.00pm – 1:45pm	LUNCH		Courtyard of Ecosystem Management building (W55)
2.00pm – 3.00pm	Concurrent workshops offering professional learning and investigation ideas relevant to NESA HSC syllabus		
	Google Apps in the Science classroom	Biology Dept, NEGS	Ecosystem Management building (W55) GIS Comp Lab
	Playing and learning in the secondary science classroom	Samantha Virtue, Walcha Central School	Ecosystem Management building (W55_EM2)
	Exciting stories of students engaging with scientists and contributing to research	Dr Lou Puslednik, St Matthews Catholic School	Ecosystem Management building (W55_EM1)
3.00pm – 3:30pm	COMPULSORY NESA SIGN OFF AND EVALUATION COMPLETION AND EVENT WRAP UP		Ecosystem Management building (W55_EM1)

UNE GRASS 2018 / Teacher PD event

Session Details / Friday 30 November



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CONCURRENT INDUSTRY FIELD VISITS	
<p>Dr. Peter Cull</p>	<p>ICT international</p> <p>In this session Peter Cull, Director at ICT International will outline this dynamic business, which focuses specifically on monitoring solutions for the measurement of plant water use and soil moisture in the natural and horticultural environment.</p> <p>These solutions and monitoring systems are developed in Australia (Armidale) and exported to scientists in more than 50x countries.</p> <p>Peter (and his team) will describe and the process of developing a profitable, high technology, scientific, export focused business from a regional location in NSW. Demonstrating an outcome that is possible in any location in regional NSW for persons that are passionate about the application of science to solving real world problems. This will include a guided tour of ICT International instrument assembly. Specifically the description and installation of a SFM1 sap flow meter in a tree, to enable tree water use to be monitored, in litres in real time will demonstrated. Data sets from iconic trees will be described that can be accessed from cloud for use by students from year 7 to 12 for science assignments and potentially depth studies.</p>
<p>Dr. Todd Andrews, NSW DPI</p>	<p>“Objective Live Animal Assessment”</p> <p>This session will cover the existing markets for beef cattle; the specifications required to meet those markets and why the specifications are important. Participants will learn how specifications such as weight, fatness and muscle score are currently determined and then how the developments in self learning camera technology can transform the way that cattle are described and marketed.</p> <p>A video showing the cameras in action will be followed by a live animal assessment exercise. At the end of this session participants will have:</p> <ul style="list-style-type: none"> – A better understanding of the way in which cattle are marketed – The ability to explain live animal assessment traits and why they are important – An appreciation of the subjective way that livestock are currently assessed, and how objective assessment will benefit both producers and consumers
<p>Mr. Peter McCook</p>	<p>Red Jewel</p> <p>Red Jewel is a family owned and operated berry plant propagation nursery that has traditionally been based in the Granite Belt of south east Queensland for the field production of some 20 million berry plants. With the berry fruit industry migrating to hydroponic growing environments, Red Jewel has moved its head office to Armidale and is currently developing a large greenhouse nursery in the New England.</p> <p>The General Manager of Red Jewel, Peter McCook, is managing the Armidale greenhouse development and will provide an insight into this innovative business, a guided tour of the facility and overview of berry plant propagation, from the original import of genetics as tissue culture, through to the commercial propagation of millions of plants. Red Jewel is the largest importer of strawberry and raspberry genetics into Australia and has differentiated itself from others in the industry by: uniquely customising its harvest and growing practices to minimise stress on the plants; being the only Nursery which runs its own Research Farm to trial new varieties and assess their performance; and the only Nursery which employs a full time Grower Liaison.</p>

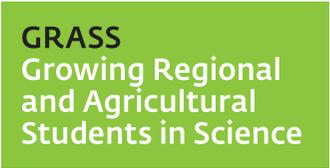
UNE GRASS 2018 / Teacher PD event

Session Details / Friday 30 November



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WHO	WHAT
Dr. Kirsti Abbott and Discovery team	<p>#agtech when you don't have a farm</p> <p>Agricultural technology in the Stage 5 and 6 syllabus is a great opportunity for solving challenging real life problems in STEM. Even if you don't have food or fibre production systems (ag plots!) at your school you can still explore agtech and provide a rich experience for students in planning and conducting an investigation, analysing data across multiple spatial and temporal scales, understanding precision agriculture and much more. In this session you'll learn how to quantify pasture biomass and growth rate using traditional scientific methods as well as using precision agriculture technology (NDVI) from a small handheld device (Greenseeker) to measure biomass in your own backyard right up to using freely available satellite data on a landscape scale. Introduce your students to making complex decisions in agriculture using real data.</p>
Suz Greig	<p>Moving into greener grassy spaces</p> <p>UNE GRASS is continuing to evolve. Suz will outline what's happened so far and what's planned for the next phase of the UNE GRASS program.</p>
CONCURRENT TEACHER SHARING SESSIONS	
Biology Dept, NEGS	<p>Amazing Add-ons</p> <p>Learn about some of the add-ons available to Google apps and Chrome which will improve your productivity and student engagement in the classroom. Create some resources of your own to utilise straight away in your Science classes. Ecosystem Management building (W55_EM1)</p>
Samantha Virtue	<p>Getting high schoolers to play and learn in science</p> <p>Play based learning is considered an essential part of early learning and primary classrooms but what can we learn from our colleagues working with younger students that we can use on the secondary classroom.</p> <p>I would like to share some ideas that I have been using after observing primary classrooms that have had some success for me in the science class, especially in the areas of the general capabilities of numeracy, literacy and social capabilities.</p>
Dr Lou Puslednik	<p>Exciting stories of students engaging with scientists and contributing to research</p> <p>Lou will outline a number of community partnerships including a strategic partnership with USYD that aims to strengthen student's research skills with a focus on statistical analysis and scientific writing. Students from year 10, 11 and 12 are working with a Professor, and research team, in the area of breast cancer detection research. This exciting experience has enabled students travelling to Italy to undertake an experimental study and this year will travel to Vietnam to help determine how efficient radiologists are at identifying cancers in mammograms. Students have produced a number of important science related products including posters for conferences, presentations for international conferences and currently we have a manuscript being reviewed in which the students are co-authors of the paper. The work the students do will be incorporated into depth studies for Investigating Science and there is also the potential for students to use this collaborative partnership to develop research for the Extension Science course.</p>
COMPULSORY NESA SIGN OFF AND EVALUATION COMPLETION	



The UNE GRASS program acknowledges the support from our valued supporters making this scholarship experience possible:



Armidale Central Rotary Club

