

Developing WIL skills in a diverse science cohort

Dr Deanne Skelly

Deputy Dean (Learning and Teaching) (Sciences)

d.skelly@griffith.edu.au



OFFICIAL PARTNER

Science Qualifications & Skills

Undergraduate Study

There is a range of pathways a student can pursue by studying a higher education science-based course. The most common award available is a three-year Bachelor of Science or Bachelor of Applied Science course. In these generic courses, students can focus on science by studying a single degree, increase the breadth of their studies by choosing electives from outside their faculty or combine with a second degree such as Arts, Commerce, Law, Engineering or Information Technology.

Skills Developed by Undergraduate Study

Science graduates are highly sought after by employers from a range of industries and sectors due to the broad range of skills and attributes developed during their study, including:

- **Discipline knowledge** – an understanding of the nature, practice and application of science with an advanced level of understanding of at least one specialised area of contemporary science, with a capacity to apply this knowledge
- **Effective communication** – write professionally as appropriate for the discipline of specialisation; make effective oral and visual presentations; communicate scientific ideas and results effectively to non-scientific audiences
- **Quantitative literacy** – collect, organise, analyse and interpret data in a meaningful way, using mathematical and statistical tools as appropriate to the discipline of specialisation
- **Information and communication technologies literacy** – use a range of sources to find the desired information, evaluate the quality of information obtained and its relevance to the task being undertaken; make effective use of current information and communication technologies to enhance work

- **Inquiry and critical thinking** – expand knowledge through evaluating arguments and synthesising ideas; apply discipline knowledge and critical thinking to analyse challenges and to develop effective solutions
- **Ethical, social and international understanding** – awareness of the ethical issues and occupational health and safety issues relating to scientific research; an understanding of how scientists, working in a worldwide community, build upon and recognise the work of others; an appreciation of the role and benefits of science in society; a capacity to contribute and in an international context
- **Management of self, others and tasks** – have the capacity to evaluate own performance; be able to appropriately plan and carry out tasks and work collaboratively and effectively with individuals and in teams

(Source: Monash University Faculty of Science
www.sci.monash.edu.au/undergrad/employ/attributes.html)

Skills employers want



3991 SCG Professional Practice in Science

- 3rd year, pre-capstone course (SEC 2.8)
- 1st introduced in 2016
 - 2 hour lecture
 - Assessment tasks focused on CV, cover letter, linkedin
- 2017 (SEC 3.5)
 - Not pre-capstone
 - Workshops (2 hours) and 1 hour lecture
 - Assessments developed more
 - Better aligned lectures, workshops and assessments

3991 SCG Professional Practice in Science

- Student group is diverse
 - Environmental Sciences
 - Biology
 - Chemistry
 - Marine Sciences
 - Mathematics
 - Physics

3991 SCG Professional Practice in Science

- *General aim is to develop employability skills and ensure students (start to) develop their understanding of potential careers in their field*

Activity	Learning Outcomes
<p>Week 1; Intro to Professional Practice course (Lecture Series): Structure of Course Introduction to elevator pitch activity(workshop week 1s and 2); Pepplepad Review course profile and L@G course site (Assessment and other</p>	1
<p>Week 2; Working with peers and providing feedback (Lecture Series): Overview of group activities and collaborative work</p>	1
<p>Week 3; informational interview/networking (Lecture Series): The role of the "scientific network"</p>	1, 2
<p>Week 4; LinkedIn and applying for work (Lecture Series): Thinking about novel avenues to find jobs</p>	1
<p>Week 5; Science and the media (Lecture Series):</p>	
<p>Week 7; Reflection in scientific practice (Lecture Series): Exploring diverse experiences to evidence your skills How to write a personal/professional reflection Evidencing in your Professional Portfolio</p>	1
<p>Week 9; How to write scientifically (Lecture Series):</p>	1, 2, 3
<p>Week 10; Science and the bigger picture (Lecture Series):</p>	1, 2
<p>Week 11; Group challenge (Lecture Series): Group challenge assessment in class</p>	1, 2

Assessment tasks

Assessment Task	Weighting/Marked out of	Learning Outcomes
<i>Guided discussion with peers</i> Elevator pitch	10%/10	1, 2
<i>Assignment - Written Assignment</i> Career action plan	20%/20	1, 2
<i>Assignment - Written Assignment</i> Reflective piece	15%/15	1, 2
<i>Creative Synthesis</i> Science in the media	20%/20	1, 2, 3
<i>Creative Synthesis</i> Group task	10%/10	1
<i>Assignment - Written Assignment</i> Reflection on Informational Interview	25%/25	1, 2

Pepplepad (e-portfolio)

- Enable students to reflect on their learning and achievement.
- Showcase students personal, educational and career development.
- Provide a platform for students to display their achievements and build on these throughout their University and professional careers.
- Increase students employability through enhancing their online presence and professional profile.
- **Development of assessment tasks that explicitly use pepplepad**

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Why group task?

- Employers want to see how candidates work well with others
- Which candidate will fit well with company culture
- Stressful interview for stressful role
- Work simulation problem solving exercise, work together in teams
- Natural leader? Get along with others?
- Common-you are on a desert island. What 5 things do you want?

Group assessment task

- **The Scenario**
- You have been allocated a position on a grants panel to provide advice regarding the Advance Queensland PhD Scholarship applications. You have eight grant applications to consider, and you have the financial capacity to **award three**. You will need to justify your choices based on the Advanced Queensland research priorities detailed below.
- You have five minutes to take a brief look at the applications, the research priorities before beginning your group discussion.
- In your panel group you will then have 25 minutes to decide which of the grant applications will be awarded, and to articulate and record the reasons for your choices. You will present your decisions to the larger group in a 2 – 3 minute presentation.

Advance Queensland grant guidelines

- **Queensland Science and Research Priorities**
- Delivering productivity growth and jobs for Queensland by developing **enhanced production technologies, tools and practices** particularly in the **agricultural, mining, advanced manufacturing** and supporting sectors including **engineering services**
- Growing our **knowledge intensives services** through **science, research and innovation**
- **Protecting our biodiversity** and heritage, marine and terrestrial, with particular focus on the **Great Barrier Reef**
- Natural advantage **cleaner, and renewable energy technologies** development (e.g. gas, solar, biofuels)
- Ensuring the **sustainability of our physical** and especially our **digital infrastructure** critical for research and - correspondingly - strategically leveraging national programs (including making use of 'big data')
- **Building resilience and managing climate risk**, through the design and development of construction technologies for extreme weather event resistance (floods, cyclones, droughts), **particularly in tropical environments**

Grant examples

- **Project title: New prophylactic drugs for malaria**
- **Project title: Impacts of Long-Term Marine Resource Use on the GBR**
- **Project title: Role of antidepressants in cancer risk and treatment outcomes**
- **Project title: Satellite Detection of Marine Pollution in the Great Barrier Reef**

- Paragraph on the general objectives of the grant
- Real world example: grant review panel, real Advance Queensland projects (2016)

Rubric: Group Task

Category	Outstanding <i>A mark of 8 – 10 out of 10 will typically be awarded for a response that shows these things</i>
Contributions	Routinely provides useful ideas in the group discussion. <u>A leader who contributes a lot of effort.</u>
Problem- solving	Actively looks for and suggests solutions to problems.
	Is never publicly critical of the project or the work or ideas of others. <u>Always has a positive attitude about the task(s).</u>
Focus on the task	Consistently stays focused on the task and what needs to be done. <u>Very self-directed.</u>
Working with Others	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together and ensures all group members have an opportunity to contribute. Engages with students who are not contributing much.

Student feedback

I have to admit I was skeptical about the course in the beginning, and would have preferred taking a science-content course instead, fearing it might be a waste of time.

In retrospect though, I have to say the course has been quite good. I feel I learned something from each of the assignments we had to do, and we always received great feedback on what we could improve, and also did well.

I am glad this was a compulsory course, as I doubt I would have enrolled otherwise, but am more than happy that I did. Thank you!

THANK YOU



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