



# ENVS338

## Environmental Quality and Assessment

S2 Day 2016

*Dept of Environmental Sciences*

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor, Lecturer & Tutor

Damian Gore

[damian.gore@mq.edu.au](mailto:damian.gore@mq.edu.au)

Contact via Email

Australian Hearing Hub Level 2

Email for an appointment

Lecturer & Tutor

Scott Wilson

[scott.p.wilson@mq.edu.au](mailto:scott.p.wilson@mq.edu.au)

Contact via Email

Australian Hearing Hub Level 2

Email for an appointment

Credit points

3

Prerequisites

39cp including [(ENVE266(P) or ENV5266(P) or GEOS266(P)) and (ENVE339 or ENV5339 or ENVE340 or ENV5340 or ENVE341 or ENV5341)]

Corequisites

Co-badged status

Unit description

Understanding and protecting the environment are key goals of environmental scientists and managers. This unit integrates the knowledge students have gained during their studies, and develops critical professional skills in the assessment of environmental quality and the application of environmental protection tools and processes. This unit assesses ecosystem health and uses current practice qualitative and quantitative methods for the measurement of soils, sediments, waters and biota. Students undertake classroom, field and laboratory studies which provide practical experience and develop their knowledge and assessment of environmental impacts, rehabilitation and management. There is a field trip during the mid-semester break, from 17-23 September. This unit prepares graduates for employment in environmental consulting and local, state and federal government workplaces. Students will also prepare individual portfolios to assist with the transition to the workplace.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

Contaminated site identification, sampling, assessment and remediation.

Knowledge and experience of environmental analytical methods.

Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.

Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.

Apply and use multiple lines of evidence and environmental frameworks for decision-making.

Identify research needs, write research style reports, and develop and conduct research programs.

Develop professional presentation and communication skills that will assist in further study and future employment.

## General Assessment Information

### Assignment submission, Turnitin and Plagiarism

This is a paperless unit, and no practicals will be physically handed in. You will submit all assignments through iLearn via a Turnitin link. Turnitin is an online program that detects plagiarised pieces of work. It compares not only work between students in the current year but also across previous years, across institutions, with all published materials, and the internet. It is an incredibly effective tool. Please write your work in your own words – in fact it is a requirement for all assignments in the course that they be written in your own words. Do not lend your work to other students - if that student plagiarises your work you too will be penalised. Do not copy and paste text into your document with the thought you will modify it later. Plagiarism involves using the work of another person and presenting it as your own. Penalties imposed by the University for plagiarism are serious and may include expulsion from the University. We are obliged to deal with any suggestion of plagiarism according to University policy. The University's policy on plagiarism is at [www.mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://www.mq.edu.au/policy/docs/academic_honesty/policy.html). This website includes a general discussion of plagiarism, definitions, examples of plagiarism, procedures that will be followed by the University in cases of plagiarism and recommended penalties. Students are expected that they will be familiar with the content of the website.

### **Extensions and penalties**

10% of the practical value will be deducted for each day a practical is late, including each day

of a weekend. If you are unable to submit the assignment by the due date then an extension must be sought before the due date unless this is absolutely impossible. To support your extension you will be asked to submit a Disruption to studies request via [ask.mq.edu.au](http://ask.mq.edu.au) (see “If you miss...” below). All applications for extensions of deadlines must be submitted to the unit convener ([damian.gore@mq.edu.au](mailto:damian.gore@mq.edu.au)).

### **If you miss an assignment submission**

Through:

Illness, misfortune, or special events

- Submit a request for Disruption to Studies via [ask.mq.edu.au](http://ask.mq.edu.au) (do not give doctor's certificates to your lecturers).
- You will need to provide documentation for illness. You cannot provide a medical certificate to [ask.mq.edu](http://ask.mq.edu) – you must have the doctor complete a Professional Authority form ([www.mq.edu.au/\\_\\_data/assets/pdf\\_file/0009/183375/professional\\_authority\\_form\\_paf.pdf](http://www.mq.edu.au/__data/assets/pdf_file/0009/183375/professional_authority_form_paf.pdf)). If you do not submit this form with the request, the Disruption to Studies request will be declined by [ask.mq.edu.au](http://ask.mq.edu.au) without ever being sent to the unit convener.
- For other situations you must provide a supporting letter explaining the circumstances that led to you missing the submission date/time ([www.mq.edu.au/policy/docs/disruption\\_studies/schedule\\_evidence.html](http://www.mq.edu.au/policy/docs/disruption_studies/schedule_evidence.html)).
- The unit convener will process your Disruption to Studies request. If approved it is your responsibility to arrange with the unit convener (via email) to complete your practical at another time.

Neglect (i.e. forgot or just slack)

- Be honest! - there's no point in submitting the paperwork above.
- Contact the unit convener (via email) to plead your case.

### **Email Protocol**

1. Be courteous i.e. address the intended reader appropriately and say thank you!
2. Spell our names correctly - we extend that courtesy to you; please do the same for us.
3. We endeavour to reply to emails in a timely fashion, but may only check and respond Monday to Friday, during working hours.

## **Assessment Tasks**

Name	Weighting	Due
<a href="#"><u>Professional Portfolio</u></a>	10%	Wk 3 - 17Aug16
<a href="#"><u>Ecotoxicology Report</u></a>	25%	Wk 12 - 02Nov16
<a href="#"><u>Mine Report</u></a>	25%	Wk 13 - 09Nov16

Name	Weighting	Due
<u>Exam</u>	40%	TBA

## Professional Portfolio

Due: **Wk 3 - 17Aug16**

Weighting: **10%**

You will produce a Professional Curriculum Vitae (value: 4%) and LinkedIn profile (either as a print-out from LinkedIn (<https://au.linkedin.com>), or an invitation from you to "Connect" with Damian, or (if you really don't want to touch LinkedIn with a barge pole), a mock-up of content using Word; value: 4%) containing evidence of your skills. The portfolio will be assessed for completeness, legibility and adequacy. Attendance at the ALGA student night will gain you an automatic 2% (those who cannot attend the night can complete a quiz of the same value). This is part of capstone unit requirements for authentic content and to help you prepare a professional portfolio.

On successful completion you will be able to:

- Develop professional presentation and communication skills that will assist in further study and future employment.

## Ecotoxicology Report

Due: **Wk 12 - 02Nov16**

Weighting: **25%**

Students will complete a comprehensive but succinct scientific report based on data compiled and assessed during the practical classes and fieldwork. The report will focus on identifying and quantifying aquatic toxicity from both field and lab tasks.

You will use multiple lines of evidence, including (i) the scientific and grey literature, (ii) data observed or measured in the field, and (iii) data derived from laboratory work. Further details of the assignment requirements will be provided in class.

On successful completion you will be able to:

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.

- Identify research needs, write research style reports, and develop and conduct research programs.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## Mine Report

Due: **Wk 13 - 09Nov16**

Weighting: **25%**

Students will complete a comprehensive but succinct scientific report based on data compiled and assessed during the practical classes and fieldwork. The report will focus on identifying and quantifying mine contamination and outline plans for remediation.

You will use multiple lines of evidence, including (i) the scientific and grey literature, (ii) data observed or measured in the field, and (iii) data derived from laboratory work. The report will be a maximum of 5,000 words and must be written and formatted in the style of the journal *Science of the Total Environment*. Further details of the assignment requirements will be provided in class.

On successful completion you will be able to:

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Identify research needs, write research style reports, and develop and conduct research programs.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## Exam

Due: **TBA**

Weighting: **40%**

Students will be tested on their knowledge of unit content. The test will include all information from all lectures, practical classes, readings, fieldwork and assessment tasks.

The examination will be conducted under usual conditions, that is, silently and with no communication between students. No written material, programmable calculators or mobile

phones may be brought into the exam room. Non-programmable calculators may be used.

On successful completion you will be able to:

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.

## Delivery and Resources

### Delivery mode

2 hr of lectures + ~2 to 4 hr of prac classes during weeks 1-6 and 8-9. There is a compulsory 7 day field trip during the mid-session break from 17-23 September, and a compulsory 2 day field trip 08-09 October. Lecture slides and related material are provided on the unit website (hopefully) the night before. Lectures will be recorded. You are expected to participate in full and to the greatest of your ability. This includes reading the literature, web materials, and completing the assessment tasks to a standard that you would expect to provide to an employer or relevant external body.

ENV5338 is a field and practical intensive unit. We aim to give you the field experience and hands on application to knowledge and theory learnt in class. The objective is to prepare you with skills for the workplace – it is not a content driven course; instead we use content to illuminate skills, practice, method and approach, all of which you will require when working. Content can change constantly in the workplace and you will need flexibility to deal with new or variable content and situations.

### Weekday, weekend and mid-session fieldwork

We run practical classes in the laboratory or field in the weekly classes, a weekend field trip and a longer mid-session field trip – all of which are compulsory. Assessment tasks are framed partly around the lectures and but mainly the practical components. A few notes about working in the field;

**Weather** - We do not normally cancel field trips for bad weather (except at contaminated sites - but we can cross that bridge when we come to it). You must be prepared to work in the rain and sun with the appropriate clothing, and avoid dehydration.

**Transport** - In the practical classes, you must provide your own. On the longer mid-session break field trip, transport will be supplied.

**Cost** - Your costs on the mid-session field work are limited to accommodation and food; transport is provided by the University. During the weekday and weekend fieldwork, we

expect that you can carpool or provide your own transport.

**Food** - On the mid-session field work, we will stay at or near delightful Inverell, a township of 16,000 people about 600 km north of Sydney. Most supplies can be purchased there. For those with special food requirements, taking some food out of Sydney may be necessary.

**Accommodation** - On the mid-session field trip will be organised by you. There are various options around Inverell, but almost certainly a motor inn or country pub. Shared rooms will save on cost.

**Personal field equipment** - Each student should bring the following on each field trip;

- Boots; No sandals or thongs in the field. Doesn't have to be steel caps, just sturdy boots.  
**NO BOOTS = NO FIELDWORK.**
- Water bottle (full, of course!) & food for each day.
- Inclement weather gear (we go irrespective of the weather). An umbrella is sometimes good to write notes under. Warm clothing, sunscreen.
- Hat - NO BASEBALL CAPS. Really. **NO BRIMMED HAT = NO FIELDWORK.**
- Waterproof (or waterproof bag) field note book and writing implements.
- Calculator, hand lens, reconnaissance maps and readings.
- Camera.
- WHS equipment, including compulsory hi-vis clothing, will be supplied by MQU.

**Website** - Practical material and important messages will be available on [www.mq.edu.au/iLearn](http://www.mq.edu.au/iLearn)

**Class times and locations:**

- Lectures - Wednesdays, 0800 - 1000 h, C5A232.
- Practicals - Wednesdays, 1100-1500 h, E5A 210 Petroglyph Lab (or the Soil Lab E5A064, or in Building EMC<sup>2</sup>, or in the field – listen for advice in the lecture and iLearn postings.

**Recommended resources** - Reading suggestions will be provided, mainly from the scientific literature, on an ongoing basis – see unit website.

## **WORKLOAD REQUIREMENTS AND COURSE RUBRIC**

Workload for units at Macquarie University is based on a minimum of 3 hours per credit point per week to receive a Pass grade. For ENV5338 this means you are expected to work at least 9 hours per week on this unit to receive a Pass grade. Obviously this is dependent on the speed at which you learn and your ability to study effectively. You will find you need to spend extra time on different parts of the course content. Depending on when assignments are due, this workload will be spread over the session. It is critical that you manage your time effectively and work progressively towards assignment submissions well in advance. A guide of hours required to receive a Pass grade is outlined below. However, keep in mind, grades are awarded on a demonstration of understanding and ability not on effort!



Activity	Per teaching week	# weeks	Hours per session
Lectures	2	7	14
Practicals	4	5	20
Assignment 1			5
Mid-session field trip			35
Weekend field trip			14
Assignment 2			20
Assignment 3			20
Exam			10
<b>Total for semester</b>			<b>138</b>
<b>Per week (15 weeks)</b>			<b>9</b>

## Assessment criteria

- **ANSWERING THE QUESTION THAT IS ASKED** with a well-developed discussion of the topic, and its implications, that places the topic in a broader context.
- Appropriate use and citation of a wide range of relevant literature, including texts, research papers, and grey literature.
- Demonstrating good planning with a clear structure, headings, and a logical argument based firmly on the literature cited.
- Presenting a legible paper with correct grammar and spelling, and correct use of professional terminology as appropriate. Your submissions must not be hand written.
- Using correct SI units and correct abbreviations.
- Referring to figures and tables in the text, with full and appropriate titles on each figure and table, irrelevant material omitted, sources given.
- Citing references acceptably, correctly and consistently in the text as well as in the reference list, no abbreviations, correct citation of chapters in edited books.
- Staying within the word limit.

If you experience difficulty achieving a good standard in your written presentation, please talk to us. The University offers a variety of remedial writing courses and sources of advice that may help you. We emphasise the necessity for clear writing and its importance in your performance assessment.

Assessment of assignments will be based on the Macquarie University scale High Distinction (HD), Distinction (D), Credit (Cr), Pass (P) and Fail (Fail). The markers may choose to further

refine these grades by use of a “+” or “-“ to indicate work towards the top or the bottom of each grade’s band of marks. Feedback will also come in the form of comments written on each student’s assignments or emailed directly to you, as well as general commentaries directed to the entire class after all marked assignments have been returned (typically in class or via an email list).

In ENV5338 we expect quality in your assignments and a level of knowledge and comprehension of course content that demonstrates what you have learnt throughout your degree and which sets the foundations for a career in this field. Grades for the unit as a whole will be awarded according to the following general criteria (course rubric).

	Developing	Functional	Proficient	Advanced
Level of attainment	Has not yet reached the desired standard. Limited understanding of required concepts and knowledge.  A <b>fail</b> grade would be given.	Has reached basic academic standards. Work has limited translation of concepts and procedures to new contexts unless aided.  A <b>pass</b> grade would be awarded.	Has completely reached the standards expected. Can work independently in new contexts, adapting procedures to meet the context. Demonstrates awareness of own limitations. A <b>credit</b> grade would be awarded.	Has gone beyond the expected standards. Exhibits high levels of independence and can use concepts to generate new ways of completing procedures. Can engage in productive critical reflection.  A grade of <b>distinction</b> or <b>high distinction</b> would be awarded.

## Unit Schedule

**Week 1 (DG/AB). Lecture 1:** Introduction, WHS, Professional practise. **Practical 1:** Soil sampling (at home). Attend ALGA student night from 1700 h.\*

**Week 2 (DG). Lecture 2:** Understanding inorganic contaminants. Remediating inorganic contaminants. **Practical 2:** Metal analysis & QA/QC (EMC<sup>2</sup> lab).

**Week 3 (DG): Lecture 3:** Understanding and remediating organic contaminants. **Practical 3:** Reactive barriers (EMC<sup>2</sup> lab).

**Week 4 (DG): Lecture 4:** Groundwater & hydraulics. **Practical 4:** Piezometer installation and monitoring (E5A compound).

**Week 5 (DG): Lecture 5:** Mining impacts. **Practical 5:** Environmental mineralogy (EMC<sup>2</sup> lab).

**Week 6:** No classes.

**Week 7:** No classes.

**Fieldwork (DG):** Inverell, 17-23 Sep 2016. **Mine characterisation & remediation.**

**Week 8 (SW): Lecture 6:** Principles of ecotoxicology.

**Fieldwork:** 08-09 October. Toxicity assessment, Biomonitoring & Bioaccumulation (Location TBA).

**Week 9 (SW): Lecture 7:** Ecological risk assessments.

**Week 10 (DG):** No formal classes; consultation (for Mine Report) first hour of practical (1100-1200 h) by appointment.

**Week 11 (SW):** No formal classes; consultation (for Ecotox Report) first hour of practical (1100-1200 h) by appointment.

**Week 12 (DG):** No formal classes; consultation (for Mine Report) first hour of practical (1100-1200 h) by appointment.

**Week 13:** No classes.

\* Wednesday, 03Aug16, 1700 h, 123 Pitt Street, Level 27, Sydney NSW 2000.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://stu>

[dents.mq.edu.au/support/](https://dents.mq.edu.au/support/)

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](https://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](https://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Identify research needs, write research style reports, and develop and conduct research programs.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## Assessment tasks

- Professional Portfolio
- Ecotoxicology Report
- Mine Report
- Exam

## Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

## Learning outcomes

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Identify research needs, write research style reports, and develop and conduct research programs.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## Assessment tasks

- Professional Portfolio
- Ecotoxicology Report
- Mine Report
- Exam

## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally

and socially.

This graduate capability is supported by:

### **Learning outcomes**

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Develop professional presentation and communication skills that will assist in further study and future employment.

### **Assessment tasks**

- Professional Portfolio
- Ecotoxicology Report
- Mine Report

## **Discipline Specific Knowledge and Skills**

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

### **Learning outcomes**

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.

- Identify research needs, write research style reports, and develop and conduct research programs.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## **Assessment tasks**

- Professional Portfolio
- Ecotoxicology Report
- Mine Report
- Exam

## **Critical, Analytical and Integrative Thinking**

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

## **Learning outcomes**

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Identify research needs, write research style reports, and develop and conduct research programs.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## **Assessment tasks**

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- Ecotoxicology Report
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- Exam

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

### Learning outcomes

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Identify research needs, write research style reports, and develop and conduct research programs.

### Assessment tasks

- Ecotoxicology Report
- Mine Report
- Exam

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

### Learning outcomes

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Identify research needs, write research style reports, and develop and conduct research programs.



- Develop professional presentation and communication skills that will assist in further study and future employment.

## **Assessment tasks**

- Professional Portfolio
- Ecotoxicology Report
- Mine Report
- Exam

## **Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

## **Learning outcomes**

- Contaminated site identification, sampling, assessment and remediation.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## **Assessment tasks**

- Ecotoxicology Report
- Mine Report
- Exam

## **Socially and Environmentally Active and Responsible**

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

## Learning outcomes

- Contaminated site identification, sampling, assessment and remediation.
- Knowledge and experience of environmental analytical methods.
- Knowledge and experience of quality assurance/quality control for environmental sampling and analysis.
- Experience in collating and analysing information from different disciplines to form a weight of evidence approach to assess environmental impacts.
- Apply and use multiple lines of evidence and environmental frameworks for decision-making.
- Identify research needs, write research style reports, and develop and conduct research programs.
- Develop professional presentation and communication skills that will assist in further study and future employment.

## Assessment tasks

- Professional Portfolio
- Ecotoxicology Report
- Mine Report
- Exam

## Performance and attendance requirements

### Minimum performance requirement

In order to pass this unit, the aggregate mark must be 50% or greater. It is not compulsory to pass each component.

### Attendance Requirements

Attendance at the mid-semester field trip is compulsory. Date: 12-18 September inclusive. Location: Near Cowra, NSW. Full details to be provided.

### Assignment submission

All assignments must be submitted either via email or in the class (via flash drive/memory stick) on the due date (Pollutants report, Portfolio); or via email or personally to the unit convenor (Field Report). If you would like feedback through the document, use doc/docx for your submission. If you just want generic comments, feel free to submit pdf. Quizzes will be on paper.

Extensions and penalties 10% of the mark allocated for the assignment will be deducted per day or part thereof for any work that is submitted late.

Handing work in on time is your responsibility. All applications for special consideration or extension must be sought before the due date unless this is impossible. All applications for

extensions of deadlines must be submitted to the unit convenor, with sufficient evidence that their case can be reviewed.

### Returning assessment tasks

Assessment tasks will be returned via email preferably, or in class for the Quizzes.

### Student Commitment

Students should expect to spend about 150 hours in total over the full semester on (including class contact hours, fieldwork and private study). These are minimum requirements and should you wish to achieve a higher than pass grade, you may choose to work harder or more efficiently.

### Feedback and unit evaluation

In this unit you will receive a range of verbal and written feedback on your assessment tasks and work in class or online. To monitor how successful we are in providing quality teaching and learning, the Department of Environmental Sciences also seeks feedback from students. One of the key ways students have to provide feedback is through unit and teacher evaluation survey. The feedback is anonymous and provides the Department with evidence of aspects that students are satisfied with and areas for improvement. For example, students previously enrolled in this unit have contributed to its development through the suggestion of more group-orientated practical tasks.

## Referencing and citations

### Referencing and Citations

There are various referencing styles. They differ markedly between journals and journal types: medical science journals differ from law journals, which differ again from science journals. We take the opinion that there is no correct *style*, however there is a right way and a wrong way. The right way is to include enough information to attribute ideas, and allow us to find the sources. The more information the better. To help you attain this "right way", we prefer and strongly recommend the referencing style in the journal *Science of the Total Environment* as it is appropriate for this unit, and it is simple and clear.

Please try to format your assignments using the method detailed here: [www.journals.elsevier.com/science-of-the-total-environment/](http://www.journals.elsevier.com/science-of-the-total-environment/)

### Reference style

*Name and year style in the text Text:*

All citations in the text should refer to:

1. *Single author:* the author's name (without initials, unless there is ambiguity) and the year of publication;
  2. *Two authors:* both authors' names and the year of publication;
  3. *Three or more authors:* first author's name followed by 'et al.' and the year of publication.
- Citations may be made directly (or parenthetically). Groups of references should be listed first

alphabetically, then chronologically. Examples: "as demonstrated (Allan, 1996a, 1996b, 1999; Allan & Jones, 1995). Kramer et al. (2000) have recently shown ..."

**List:**

References should be arranged first alphabetically and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters "a", "b", "c", etc., placed after the year of publication. Note that any (consistent) reference style and format may be used.

**Examples:**

**Journal:** Van der Geer, J., Hanraads, J.A.J., Lupton, R.A. 2000. The art of writing a scientific article. *Journal of Scientific Communications* 163, 51-59.

**Book:** Strunk Jr., W., White, E.B. 1979. *The Elements of Style*, third ed. Macmillan, New York.

**Chapter in an edited book:** Mettam, G.R., Adams, L.B. 1999. How to prepare an electronic version of your article, in: Jones, B.S., Smith, R.Z. (Eds.), *Introduction to the Electronic Age*. E-Publishing Inc., New York, pp. 281-304.

**URL:** USEPA (United States Environment Protection Authority) Method 1311. Toxicity Characteristic Leaching Procedure. <https://www.epa.gov/sites/production/files/2015-12/documents/1311.pdf> (accessed 27Jul16).