



ENVE338

Environmental Quality and Assessment

S2 Day 2015

Dept of Environmental Sciences

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Unit Convenor, Lecturer

Damian Gore

damian.gore@mq.edu.au

Contact via Email

Australian Hearing Hub Level 2

Email for an appointment

Lecturer

Danielle Camenzuli

danielle.camenzuli@mq.edu.au

Contact via Email

Australian Hearing Hub Level 2

Email for an appointment

Credit points

3

Prerequisites

39cp including [(ENVE266(P) or GEOS266(P)) and (ENVE339 or ENVE340 or ENVE341)]

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 19-25 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 & remediation.

Knowledge and experience of chemical assessment methods.

Knowledge and experience of quality assurance 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

Name	Weighting	Due
Quizzes	8%	In class, Weeks 2, 4, 6, 9
Pollutants	2%	12 August (Week 3)
Portfolio	15%	19 August (Week 4)
Field Report	35%	28 October (Week 12)
Exam	40%	TBC

Quizzes

Due: **In class, Weeks 2, 4, 6, 9**

Weighting: **8%**

Short quizzes will be conducted on Weeks 2, 4, 6 and 9. They will help to reinforce the content of lectures and readings. The contents of each quiz could be drawn from anything preceding in the unit to that time, so the quizzes may become more diverse over time. Each quiz will be worth 2% and the total of the four quizzes 8%.

On successful completion you will be able to:

- Contaminated site identification, sampling, assessment & remediation.
- Knowledge and experience of chemical assessment methods.
- Knowledge and experience of quality assurance 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.

Pollutants

Due: **12 August (Week 3)**

Weighting: **2%**

Students will search, gather and provide detail to the class, via a 3 minute oral presentation and a related submission (1 powerpoint slide only), information about a pollutant or group of pollutants. You will present on (i) the human and environmental risks associated with that pollutant, (ii) where those risks are most likely to occur, (iii) who is most at risk, (iv) some environmental or epidemiological examples about the effects of that pollutant, and (v) associated information on Australian guidelines, policies and safety measures. Examples may include arsenic, asbestos, cadmium, faecal coliforms, legionella, plutonium, selenium etc. You won't have a choice; we will nominate one for you. You will be marked on how well you address the points above (and we understand that not all pollutants have each of the five points).

The objective is to ensure that you understand that there are a wide range of organic and inorganic contaminants in land, air and water that may pose a risk of harm to humans and the environment.

On successful completion you will be able to:

- Contaminated site identification, sampling, assessment & remediation.
- Knowledge and experience of chemical assessment methods.
- 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.

Portfolio

Due: **19 August (Week 4)**

Weighting: **15%**

You will produce a Professional Curriculum Vitae (value - 9%) 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 - 6%) containing evidence of your skills. The portfolio will be assessed for completeness, legibility and adequacy. 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.

Field Report

Due: **28 October (Week 12)**

Weighting: **35%**

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. Further details of the assignment requirements will be provided in class.

On successful completion you will be able to:

- Contaminated site identification, sampling, assessment & remediation.
- Knowledge and experience of chemical assessment methods.
- Knowledge and experience of quality assurance 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: TBC

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 & remediation.
- Knowledge and experience of chemical assessment methods.
- Knowledge and experience of quality assurance 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 prac classes each week of semester. There is a compulsory 7 day field trip during the mid-semester break. Lecture slides and related material are provided on the Unit website at least 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.

ENVE338 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, we use the 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 AND MID-SEMESTER BREAK FIELDWORK

We run practical classes in the laboratory or field in the weekly classes and a longer mid-semester fieldtrip – all of which are compulsory. Assessment tasks are framed around the lectures and practical components. A few notes about working in the field:

Weather:

We do not normally cancel fieldtrips for bad weather! 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-semester break field trip, transport will be supplied.

Cost:

Your costs on the fieldwork are limited to accommodation and food; transport is provided by the University.

Food:

We will be staying at delightful Cowra, a township of 10,000 people about 310 km west of Sydney. Most supplies can be purchased there. For those with special food requirements, taking some food out of Sydney may be necessary.

Accommodation:

Will be organised by you. There are various options around Cowra, but almost certainly a motor inn or country pub. Shared rooms will save on cost.

Personal field equipment:

- Each student should bring the following aids/comforts on each field trip:
- **Boots**; No sandals or thongs in the field. Doesn't have to be steel caps, just sturdy boots.
- 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.
- Waterproof (or waterproof bag) field note book and writing implements (see note below).
- Calculator, hand lens, reconnaissance maps and readings.
- Camera.

IF YOU DON'T HAVE STURDY BOOTS AND A BRIMMED HAT, YOU WILL NOT DO FIELDWORK.

WHS equipment, including compulsory hi-viz clothing, will be supplied by MQU.

Website:

Practical material and important messages will be available on www.mq.edu.au/iLearn

Class times and locations:

- Wednesdays, Lecture 1100 - 1300 h, E7B264.
- Practicals: 1400-1800 h. E5A 210 Petroglyph Lab (or the Soil Labs E5A064 or in Building EMC²). Note: we will not always be in this room for this session – several sessions will be field-based – listen for advice in the lecture and iLearn postings].

Recommended resources:

Reading suggestions will be provided on an ongoing basis – see unit website.

Unit Schedule

Week	Lecture	Practical	Assessment
1	DG/AB/DC - Introduction, WHS, Professional role	Prac1 - DC - Sampling (class/field)	
2	DC - Understanding inorganic contaminants	Prac2 - DC - Metal analysis & QA/QC (class/lab)	Quiz 1 - 2%
3	DC - Remediating inorganic contaminants	Prac3 - DC - Pollutants (student presentations - class)	Pollutants - 2%
4	DG - Energy	Prac4 - DG - Energy (class/lab)	Quiz 2 - 2% Professional Portfolio - 15%
5	DC - Mining impacts	Prac5 - DG - Environmental mineralogy (lab)	
6	DG - Groundwater and hydraulics	Prac6 - DG - Piezometer installation (field)	Quiz 3 - 2%
7	DG - Understanding and remediating organic contaminants	Prac7 - DG - Fieldwork preparation & packing (class)	
	Mid semester fieldwork 12-18 Sep	Mine characterisation & remediation	
8	DC - Landfills and other contaminating land uses	Prac8 - DC - Sample analysis from fieldwork (lab)	
9	DG - Erosion/Sedimentation	Prac9 - DC - Reactive Barriers (lab)	Quiz 4 - 2%
10	DG - Stormwater & WSUD	Prac10 - DG - Urban GPTs (field)	
11	<i>No classes</i>	<i>No classes</i>	
12	<i>No classes</i>	<i>No classes</i>	Field Report - 35%
13	<i>No classes</i>	<i>No classes</i>	
Date tbc			Final exam - 40%

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

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy 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/

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.

Student Support

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

Learning Skills

Learning Skills (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

IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use 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

- Quizzes
- Pollutants
- Portfolio
- Field 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 & remediation.
- Knowledge and experience of quality assurance 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.

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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

- Knowledge and experience of quality assurance for environmental sampling and analysis.
- Develop professional presentation and communication skills that will assist in further study and future employment.

Assessment tasks

- Quizzes

- Pollutants
- Portfolio
- Field Report
- Exam

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 & remediation.
- Knowledge and experience of chemical assessment methods.
- Knowledge and experience of quality assurance 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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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 & remediation.
- Knowledge and experience of chemical assessment methods.
- Knowledge and experience of quality assurance 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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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 & remediation.
- Knowledge and experience of chemical assessment methods.
- Knowledge and experience of quality assurance 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.
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Assessment tasks

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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

- Knowledge and experience of chemical assessment 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

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

Assessment tasks

- Quizzes
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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 & remediation.
- Knowledge and experience of chemical assessment methods.
- 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

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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 Environmental Pollution 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.sciencedirect.com/science/journal/02697491

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:

Reference to a journal publication:

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.

Reference to a book:

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

Reference to a 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.

Reference to a URL:

NTP (National Toxicology Program), 2012. National Toxicology Program Monograph on Health Effects of Low-level Lead. U.S. Department of Health and Human Services. June 13th, 2012. <http://ntp.niehs.nih.gov/NTP/ohat/Lead/Final/>

MonographHealthEffectsLowLevelLead_prepublication_508.pdf (accessed 19Nov15).

Changes since First Published

Date	Description
24/07/2015	Updated submission date, Pollutants assessment task.