



# ENVS338

## Environmental Quality and Assessment

S2 Day 2018

*Dept of Environmental Sciences*

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#### **Disclaimer**

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## General Information

### Unit convenor and teaching staff

Convenor, lecturer

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Co-convenor, lecturer

Scott Wilson

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### Credit points

3

### Prerequisites

(39cp at 100 level or above) including [(ENVE266 or ENV5266 or GEOS266) 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 for 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 environmental health using 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. A field trip from 15021 September gives students practical experience of sites such as derelict mines. This unit prepares graduates for employment in environmental consulting and local, state and federal government workplaces. Students will also prepare material to assist with their 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.

## Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Professional portfolio</u>	20%	No	Week 3
<u>Mine Report</u>	25%	No	Monday COB, Week 9
<u>Ecotoxicology Report</u>	25%	No	Monday COB, Week 12
<u>Final examination</u>	30%	No	Exam period

### Professional portfolio

Due: **Week 3**

Weighting: **20%**

You will produce a Professional Curriculum Vitae (value: 10%) and LinkedIn profile (<https://au.linkedin.com>), with an invitation from you to "connect" with Damian and the Department of Environmental Sciences, or for those who would prefer not to develop a profile, a mock-up of content using Word; value: 10%) 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.

## Mine Report

Due: **Monday COB, Week 9**

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 *Environmental Pollution*. 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.

## Ecotoxicology Report

Due: **Monday COB, Week 12**

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 the mine site visit on the mid-session field trip. 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 to determine toxicity and the likely causes. 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.

## Final examination

Due: **Exam period**

Weighting: **30%**

A final examination which encapsulates all aspects of the unit content and readings.

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

Readings will be suggested on a weekly basis via iLearn. A working knowledge of MS Word and Excel (or some other word processing and spreadsheet package) is assumed. A willingness to use Minitab (or some other statistics package) is assumed.

## Unit Schedule

Topics to be covered include inorganic and organic contaminants, and their impacts on biota. The outline is;

**Week 1.** (DG, AB). **Lecture 1:** Introduction, responsibilities of the consultant, professional practise, WHS. **Practical 1.** Sampling for inorganic.

**Week 2.** (DG). **Lecture 2.** Understanding and remediating inorganic contaminants. **Practical 2.** Analysis of inorganics.

**Week 3.** (DG). **Lecture 3.** Mining impacts. **Practical 3.** Environmental mineralogy.

**Week 4.** (SW). **Lecture 4.** Water quality. **Practical 4.** Factors influencing water quality.

**Week 5.** (SW). **Lecture 5.** Principles of ecotoxicology and laboratory toxicity tests. **Practical 5.** Ecotoxicology in the laboratory.

**Week 6.** (SW). **Lecture 6.** Biomonitoring & bioaccumulation. **Practical 6.** Ecotoxicology in the field.

**Mid-session fieldtrip.** (DG, SW). 15-21 September. Fieldwork at legacy (derelict) mines will be conducted in central NSW and students this year will organise their own accommodation in Bathurst, NSW, for the nights Saturday 15 - Wednesday 19 September. We will return to University on Thursday 20 September, and Friday 21 September will be spent measuring samples in the laboratory at Macquarie University. All parts of the fieldtrip and laboratory work are compulsory.

**Week 9.** (DG). **Lecture 7.** Understanding and remediating organic contaminants. **Practical 7.** Working through field data.

**Week 10.** (SW). **Lecture 8.** Ecological risk assessment. **Practical 8.** Analysis of field data.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central>). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway](https://students.mq.edu.au/support/study/student-policy-gateway) (<https://students.mq.edu.au/support/study/student-policy-gateway>). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/p) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/p>

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## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/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://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://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](http://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**

- 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
- Mine Report
- Ecotoxicology Report
- Final examination

## **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 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.

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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**

- 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.

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## 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.
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- Identify research needs, write research style reports, and develop and conduct research programs.
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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 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.
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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 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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## **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.
- 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.
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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 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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## 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.
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## **Assessment tasks**

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