



ENVS898

Management of Degraded Environments

S2 Evening 2018

Dept of Environmental Sciences

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	5
<u>Unit Schedule</u>	6
<u>Policies and Procedures</u>	8
<u>Graduate Capabilities</u>	9
<u>Assessment Submission and Marking</u>	12
<u>Field Trip Work, Health and Safety</u>	15
<u>Recommended readings</u>	16
<u>Requirements to Complete this Unit Success</u>	
<u>fully</u>	17
<u>Unit Homepage</u>	19

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General Information

Unit convenor and teaching staff

Lecturer

Dr Kerrie Tomkins

kerrie.tomkins@mq.edu.au

Professor

Dr Damian Gore

damian.gore@mq.edu.au

Credit points

4

Prerequisites

Admission to MEnv or MSc or GradDipEnv or GradCertEnv or MEnvPlan or MPlan or MSusDev or GradDipSusDev or GradCertSusDev or MMarScMgt or MConsBiol or GradDipConsBiol or PGDipSc in Biodiversity Conservation

Corequisites

Co-badged status

Unit description

This interdisciplinary unit aims to develop understanding of some aspects of the impact of human activities on the environment and remedial actions which can be taken. Topics may include one or more of: urban and industrial environmental remediation; rural landscape degradation processes and pathways; remediation techniques in rural landscapes; river rehabilitation; environmental flows; catchment management strategies; and mine site rehabilitation. This unit is a combination of evening classes, weekend field days, and web, library and field-based individual research.

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:

Describe the fundamental causes and processes involved in environmental degradation for at least two different environments.

Outline several current approaches for managing degraded environments including

examples for at least two different environments.

Demonstrate an effective grasp of the literature and an understanding of the issues and approaches to managing degraded environments in Australia compared to other parts of the world.

By individual research and field observations, identify the processes involved in the degradation of a site, evaluate their management, and offer solutions for remediation and future management.

Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan and preparing a new environmental management plan for a degraded site.

Develop skills and experience in presenting the results of research orally and in a written report, suitable for the target audience (landholders and members of the public).

Assessment Tasks

Name	Weighting	Hurdle	Due
<u>Extended Response Questions</u>	40%	No	Mon 10 Sept 2018
<u>Report and Presentation</u>	60%	No	Mon 5 Nov 2018

Extended Response Questions

Due: **Mon 10 Sept 2018**

Weighting: **40%**

The aim of this Assessment is to draw together the lecture material from the first 4 weeks and to extend knowledge on other aspects that are highly relevant to the unit. The Assessment consists of 5 questions which are worth 8 marks (8 %) each. To answer each question well, you will need to do extensive background reading, research and critical thinking.

On successful completion you will be able to:

- Describe the fundamental causes and processes involved in environmental degradation for at least two different environments.
- Outline several current approaches for managing degraded environments including examples for at least two different environments.
- Demonstrate an effective grasp of the literature and an understanding of the issues and approaches to managing degraded environments in Australia compared to other parts of the world.

Report and Presentation

Due: **Mon 5 Nov 2018**

Weighting: **60%**

This Assessment aims to give students some practical experience in developing an environmental management plan. In this instance, you will develop a rehabilitation plan for the Fish River, near Bathurst NSW following years of sand and gravel extraction from the river. The Assessment is done in small groups of ~ 4 students, but individual contributions are assessed by way of peer review. A break-down of the Assessment is as follows:

1. Report: Each group will develop a rehabilitation plan that will be presented, along with supporting information, as a comprehensive report which is due in Week 13. The report will be assessed and the group mark will be awarded to each student in the group (worth 50 % of the total 60 %).
2. Participation: The contribution of each student to the group report will be assessed by peer review using the SPARKPLUS software. The peer review will assess each group members' contribution to the core tasks (e.g. design of the rehabilitation plan, analysis of background information and field data, development of recommendations, writing and editing of the report) as well as their teamwork skills throughout the whole project including the field trip. The results of the peer review will be used to convert the group report mark outlined in (1) into an individual mark.
3. Presentation: Each group will give a presentation of their rehabilitation plan to the class. The time allocated will be 5 mins per group member, plus 10 mins question and answer time per group. The presentation will be assessed individually based on the communication style and effectiveness of each student (worth 10 % of the total 60 %).

Further information on the Assessments will be provided at the start of semester.

On successful completion you will be able to:

- Describe the fundamental causes and processes involved in environmental degradation for at least two different environments.
- Outline several current approaches for managing degraded environments including examples for at least two different environments.
- By individual research and field observations, identify the processes involved in the degradation of a site, evaluate their management, and offer solutions for remediation and future management.
- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan and preparing a new environmental management plan

for a degraded site.

- Develop skills and experience in presenting the results of research orally and in a written report, suitable for the target audience (landholders and members of the public).

Delivery and Resources

Evening classes

The weekly program consists of 3-hour classes on Monday nights from 6 - 9 pm in 25a WW G08 tutorial room (W6BG08). The classes include a combination of lectures, practical exercises, class discussion and student presentations as outlined in the unit schedule and text below.

Note: Please bring writing materials and laptop computers to each class.

- *Lectures and practical exercises:* Weeks 1-6 and 8-9 will include background presentations and practical exercises that are essential to convey the course content and prepare for the field trip and assessments. Attendance is compulsory.
- *Plan feedback sessions:* In Weeks 11 and 12 students are required to discuss their progress on Assessment 2 with the convenor.
- *Student presentations:* These will be held in Week 13 as part of Assessment 2. Each student is required to present, as well as participate in the question-answer sessions following each group presentation. Attendance is compulsory.

Field Trip: 12-14 October 2018

The unit includes a weekend field trip to the Bathurst area in the central-west of NSW, commencing on Friday 12 October at 1 pm. During the field trip, students will visit:

- Former Browns Creek Mine site to view environmental management and rehabilitation aspects of the old mine, driving back via Cadia Mine.
- Fish River sand and gravel extraction site to view river degradation issues and collect field data for Assessment 2.

We will stay in Bathurst on the Friday and Saturday nights. Accommodation will be organised by the convenor. Transport is to be organised by each student, with car-pooling recommended. See below for further details on costs. Details on logistics will be provided at the start of semester and in the weeks prior to the trip. Attendance on the field trip is compulsory.

Field trip essentials on what to bring

Each student will need to ensure that they are equipped with the following essentials during each field trip:

- Adequate food for each day (i.e. packed lunch)
- Adequate water for each day (minimum 1 ltr)
- Rain jacket
- Clothing appropriate for the weather and season (e.g. warm jumper, long-sleeved shirt for sun protection)
- Hat and sunscreen
- Closed shoes, preferably boots
- Field book, writing materials and camera

Field trip costs

The cost of the field trip is not included in the course fees, however all attempts are made to keep these to a minimum. Additional costs that will need to be paid by each student include overnight accommodation (2 nights), meals and transport.

We usually stay at the Havannah Apartments in Bathurst which offers twin and single rooms. The cost for accommodation is \$50 per person per night twin share, and \$100 per person per night for a single room. While it is anticipated that most will stay with the group, students are welcome to organise their own accommodation if they prefer.

Unit Schedule

Week	Date	Component
1	Mon 30 July	<i>Module 1: Managing degraded environments: an introduction</i> <ul style="list-style-type: none">• Unit overview• Introduction to environmental degradation (KT)
2	Mon 6 Aug	<ul style="list-style-type: none">• Degraded riverine environments: causes and approaches to managing problem sites (KT)
3	Mon 13 Aug	<ul style="list-style-type: none">• Degraded mining environments: causes and approaches to managing problem sites (DG)
4	Mon 20 Aug	<ul style="list-style-type: none">• Approaches to managing other degraded environments (in-class forum) (KT)

5	Mon 27 Aug	<p>Module 2: Evaluating existing rehabilitation plans</p> <ul style="list-style-type: none"> River rehabilitation plans: Key points in developing a river rehabilitation plan, including examples of Assessment 2 from previous years (KT).
6	Mon 3 Sept	<ul style="list-style-type: none"> Mine remediation/rehabilitation plans: Analysis of the Cadia Mine Rehabilitation Strategy and water quality data (DG)
7	Mon 10 Sept	<p><i>No class</i></p> <p>Extended Response Questions (40 %) due: Mon 10 Sept</p>
		<p><i>BREAK</i></p>
8	Tues 2 or Wed 3 Oct (Mon 1 Oct is public hol)	<p>Module 3: Developing your own rehabilitation plan</p> <ul style="list-style-type: none"> Fish River site and catchment Field trip logistics Start on your rehabilitation plan for the Fish River (develop a draft structure for the report) (KT)
9	Mon 8 Oct	<ul style="list-style-type: none"> Fish River rehabilitation plans continued (KT)
	Fri 12 – Sun 14 Oct	<p>Field trip</p> <p>Day 1: Browns Creek and Cadia</p> <p>Day 2 & 3: Fish River</p>
10	Mon 15 Oct	<p><i>No class</i></p>
11	Mon 22 Oct	<p><i>No class</i> (feedback on your draft plan, KT)</p>
12	Mon 29 Oct	<p><i>No class</i> (feedback on your draft plan, KT)</p>
13	Mon 5 Nov	<ul style="list-style-type: none"> Student presentations of the Fish River Rehabilitation Plans (KT) <p>Report (50 %), Participation and Presentations (10 %) due: Mon 5 Nov</p>

*Class: Mon 6-9 pm, 25a WW G08 tutorial room (W6BG08)

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/policy-central) (<https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/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/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.

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://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

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- By individual research and field observations, identify the processes involved in the degradation of a site, evaluate their management, and offer solutions for remediation and future management.
- Develop skills and experience in presenting the results of research orally and in a written report, suitable for the target audience (landholders and members of the public).

Assessment task

- Report and Presentation

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen fields.

This graduate capability is supported by:

Learning outcomes

- Describe the fundamental causes and processes involved in environmental degradation for at least two different environments.
- Outline several current approaches for managing degraded environments including examples for at least two different environments.
- Demonstrate an effective grasp of the literature and an understanding of the issues and approaches to managing degraded environments in Australia compared to other parts of the world.
- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan and preparing a new environmental management plan for a degraded site.

Assessment tasks

- Extended Response Questions
- Report and Presentation

PG - Critical, Analytical and Integrative Thinking

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:

Learning outcomes

- Demonstrate an effective grasp of the literature and an understanding of the issues and approaches to managing degraded environments in Australia compared to other parts of the world.
- By individual research and field observations, identify the processes involved in the degradation of a site, evaluate their management, and offer solutions for remediation and future management.
- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan and preparing a new environmental management plan for a degraded site.

Assessment tasks

- Extended Response Questions

- Report and Presentation

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

- By individual research and field observations, identify the processes involved in the degradation of a site, evaluate their management, and offer solutions for remediation and future management.
- Develop skills and experience in analysing environmental data, critiquing an existing environmental management plan and preparing a new environmental management plan for a degraded site.

Assessment task

- Report and Presentation

PG - Effective Communication

Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcome

- Develop skills and experience in presenting the results of research orally and in a written report, suitable for the target audience (landholders and members of the public).

Assessment tasks

- Extended Response Questions
- Report and Presentation

PG - Engaged and Responsible, Active and Ethical Citizens

Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcome

- Demonstrate an effective grasp of the literature and an understanding of the issues and approaches to managing degraded environments in Australia compared to other parts of the world.

Assessment task

- Extended Response Questions

Assessment Submission and Marking

Assessment submission

This unit uses electronic submission and marking. The required format and mode of submission is as follows. Note that there is no requirement to submit a hard copy as well, unless specified. Further details on how to use Turnitin will be provided separately.

Assessment	Submission Format
Extended Response Questions	Submit the answers to the Extended Response Questions as a single document through Turnitin - see iLearn for the relevant Assessment link.
Report	A member of each group must submit an electronic copy of the rehabilitation plan report through Turnitin - see iLearn for the relevant Assessment link.
Presentations	A member of each group must submit a powerpoint or PDF copy of the rehabilitation plan presentation through Turnitin - see iLearn for the relevant Assessment link.
Participation	Each student must complete the peer-review of the members of their group using the SPARKPLUS software - see additional assessment information on iLearn for login details and instructions on how to use SPARKPLUS.

General assessment criteria

The general assessment criteria that is used to examine the overall attainment of knowledge, skills and abilities includes the following, where the level of achievement is expected to be at the standard of a post-graduate student in each of the criteria.

- Students are able to **complete the assessments as instructed**, including answering the question that is asked and staying within the specified word limit.
- Students can **demonstrate knowledge and research skills** by engaging in the subject matter and developing an understanding of the topic through literature and data searches.
- Students are able to **demonstrate independent and in-depth thinking** through

discussion that places the topic in the broader context and through developing new ideas.

- Students are able to **demonstrate good planning and structure written and verbal work** to convey ideas clearly and logically.
- Students will **submit work that is presented in a professional manner**, including correct grammar and spelling, correct use of professional terminology as appropriate, and correct use of SI units, abbreviations and acronyms.
- Students are able to **use figures and tables to summarise or present information and data effectively**, with reference to these in the text. Informative figure captions and table headers are included and positioned accordingly, with the source of each provided where relevant.
- Students are able to **demonstrate effective communication** by conveying their message clearly and concisely using written and verbal formats.
- Students are able to **work individually and in teams**.

Assessment marking and grades

Grading forms will be used to mark each assessment. These will be provided on iLearn along with further instructions on the assessments. Feedback will also come in the form of written comments.

In the case of Group assessments, all members of the group will initially receive the same mark, but these will be moderated based on the peer review to provide a fairer representation of contribution towards the group task.

Evaluation of assessments will be based on the Macquarie University scale: High Distinction (HD, 85-100 %), Distinction (D, 75-84 %), Credit (Cr, 65-74 %), Pass (P, 50-64 %) and Fail (Fail, 0-49 %). Grades may be further refined by use of a “+” or “-” to indicate work towards the top or the bottom of each grade’s band of marks.

If you experience difficulty achieving a good standard in your written work, please let the convenor know ASAP. 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.

Academic Honesty

In completing and submitting the Assessments, students must be aware of, and adhere to, the University policy on Academic Honesty, which can be accessed here: http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

The University implements the Academic Honesty Policy for **all** pieces of academic work by

using a number of systems and checks, including:

- Copy detection software such as Turnitin
- Random sampling of assessment items to check for similarities
- Comparing student performance across a number of tasks
- Requiring students to defend submitted work e.g. oral exams or presentations

The penalties, where a person has been proven to have breached the policy (or any of its related procedures), are outlined here: http://www.mq.edu.au/policy/docs/academic_honesty/schedule_penalties.html

Each student is responsible for their own work and for reporting suspected breaches to the convenor or Head of Department together with all relevant materials or evidence of the basis of the allegation.

Penalties for late assessments and extension requests

All assessments must be completed and submitted, on time and in full, in order to receive a minimum pass grade.

Penalties for late written assessments will be a minimum of 10% per day (including weekend days) or part thereof. These deadlines and penalties **will** be imposed. Allowing some students to hand assessments in late is unfair to those who meet the deadlines.

The deadlines for assessments are not negotiable except in the circumstances outlined below. Please take note of the DAYS at which work is due and let the Convenor know of problems in advance or as soon as possible, not after the event: they are likely to be much more sympathetic and flexible if you follow this advice.

The University has a Disruption to Studies Policy, which can be accessed here: http://mq.edu.au/policy/docs/disruption_studies/policy.html

In accordance with the Policy, students that experience a disruption to studies which is serious, unavoidable and greater than 3 days as per the Policy guidelines, and wish to request an assessment extension on these grounds, must submit a formal application for special consideration to the Science Faculty. <http://science.mq.edu.au/current-students/postgraduate-students/>

If a student experiences a disruption to studies that is unavoidable, but not serious and is of 3 days or less in duration, they can apply for special consideration to the convenor under the following conditions:

- Personal illness or illness of a child – If an assessment is submitted after the due date, a medical certificate or a letter with appropriate supporting documents outlining the extenuating circumstances must be provided that covers the day that the assessment was due, and/or the days preceding.

- Work commitments - Work commitments will not be viewed as grounds for an extension unless your work commitment requires you to be away from home for at least 1 overnight or requires you to be at work for longer than 12 hours per day, e.g. field work or interstate meetings.
- Other family commitments or emergencies - If you have other commitments that take you away from study you should plan for these in advance as part of an effective individual study plan. Extensions will only be considered if your ability to submit an assessment on time was caused by an unexpected event where you can demonstrate: that the event was not foreseeable or predictable and that the event substantially impacted upon your ability to complete the Assessment Task and that there was alternative option available.

The number of days of disruption and the timing of disruption will be taken into considered in determining whether special consideration should be granted or not. The ultimate grounds for the decision will be whether the disruption was unavoidable and fairness with respect to other students.

Field Trip Work, Health and Safety

The safety of you and those around you is our highest priority. Consequently, ALL participants in fieldwork activities are obliged to work and behave appropriately in the field, and to take care to protect their own health, safety and welfare and that of fellow fieldwork participants. You are required to follow instructions from the Fieldwork Leader at all times.

Prior to the fieldwork, you must complete the Field Friendly registration (link to be provided). In the registration, you must let the Fieldwork Leader know of any allergies, special dietary requirements or medical considerations that may affect your ability to participate in fieldwork. For known medical conditions, you will also need to provide a treatment plan. Details of your responsible next of kin must be provided in case of emergencies.

You are required to wear and carry clothing and footwear as appropriate to the fieldwork situation. Your Fieldwork Leader will advise you as to what these are prior to the field trip. Irrespective of the activity, footwear must be worn. For terrestrial fieldwork, ankle to knee protection must be worn either in the form of either long trousers or gaiters. For marine fieldwork, appropriate clothing to protect against sunburn and exposure should be worn. For all fieldwork activities, a hat, sunscreen, insect repellent and items to protect against unexpected weather changes, such as rain & cold, are strongly recommended. The Fieldwork Leader reserves the right to exclude anyone that is ill-equipped from the activity.

If you are taking any medication, please ensure that you take sufficient supplies with you on the field trip. The University's staff are unable, by law, to provide this to you. This includes pain relief, such as panadol or nurofen, cold and flu medication and anti-histamines for allergies.

If you need to leave the field location for any reason prior to completion of the scheduled activities, you must first inform the Fieldwork Leader. In the event of illness or injury, please let the Fieldwork Leader know immediately. All injury's or incidents must be reported via the on-line

reporting system: <http://www.ohs.mq.edu.au/form5a.php>

Alcohol is a significant contributing factor in many incidents and acts of prejudicial conduct. Alcohol must not be consumed when undertaking fieldwork activities or when using a motor vehicle/machinery. After-hours consumption of alcohol is at the discretion of the Fieldwork Leader. Anyone acting irresponsibly or in any way deemed to be a danger to themselves or others by the Fieldwork Leader will be required to leave the field trip, return to Sydney at their own expense and report to the Head of Department. The consequences of this may include exclusion from the Unit of study or your Degree program.

For more information, contact:

Russell Field

Fieldwork Manager (Dept of Environmental Sciences)

Macquarie University NSW 2109.

(W) 98508341

Recommended readings

The following textbooks and other material related to the field trip are recommended for background reading. Note: it is essential that each student does their own literature searches and finds materials, particularly scientific papers that are relevant to the unit. This requirement is to: aid learning and understanding of the subject matter, develop good research skills, and successfully complete the unit assessments. The library has a number of search engines that will enable you to directly access publications using ArticleLinker e.g. Web of Knowledge. Google Scholar can also be useful to find reports and other grey literature.

Environmental Management Standards

- AS/NZS ISO 14001:2004 Australian/New Zealand Standard Environment management systems – Requirements with guidance for use. Standards Australia. (available online using the library licence)

Mining environments

- Mulligan D.R. (ed) (1996) *Environmental Management in the Australian Minerals and Energy Industries*. UNSW Press. 793 pp. (library)
- Lottermoser B.G. (2010) *Mine Wastes: characterisation, treatment and environmental impacts*. 3rd edition. Springer-Verlag Berlin. 400 pp. (available online).

Former Browns Creek Mine

- Corkery R.W. & Co (1988) *Mining, rehabilitation and environmental management plan for the Browns Creek Mine: annual report no. 144/2*. (library)
- Corkery R.W. & Co (2002) *Browns Creek Horticultural Products Production Facility: Environmental impact statement* (3 vols), prepared by R.W. Corkery & Co. Pty Limited

on behalf of Australian Native Landscapes Pty Ltd. R.W. Corkey, Orange NSW. (library)

Cadia Mine

- Bewert K.E., McQueen K.G. and McPhail D.C. (2003) Regolith-landform mapping and soil survey for mining rehabilitation and environmental management in the Cadia Valley, central NSW. In: Roach I.C. (ed) *Advances in Regolith*. CRC LEME. Pp 19-23. (available online)
- King N., Beard J. and Gibbs A. (2003) Contamination of an upland stream by heavy metals from an old mine site. *Australasian Journal of Ecotoxicology*. 9:61-68. (available online).
- Rohde T.K. and Williams D.J. (2008) Early hydrological monitoring of Cadia's Instrumented Trial Waste Rock Dump. Presented at Securing the Future and the 8th ICARD, June 23-25, 2009, Skelleftea, Sweden. (available online)

Riverine environments

- Brierley G.J. and Fryirs K.A. (2005) *Geomorphology and river management: applications of the River Styles framework*. Blackwell Publishers, Oxford, UK. 398 pp. (library)
- Downs P.W. and Gregory K.J. (2004) *River channel management: towards sustainable catchment hydrosystems*. Hodder Arnold, London, UK. 395 pp. (Republished 2014 by Routledge). (library)
- Conacher A.J. and Conacher J. (1995) *Rural land degradation in Australia*. Oxford University Press, UK. 170 pp. (library)
- Stocking M. and Murnaghan M. (2001) *Handbook for the field assessment of land degradation*. Earthscan Publications Ltd, London, UK. 169 pp. (library)

Fish River

- Richardson K. and Associates (1996-1997) Fish River Project: proposed extractive industry. Environmental Impact Statement. For Balmana Earthmoving and Transport Pty Ltd. 3 volumes. (library)

International issues

- Barrow C.J. (2005) *Environmental Management and Development*. Volume 5 Routledge perspectives on development. Routledge, London. 286 pp. (library)

Requirements to Complete this Unit Successfully

Compulsory attendance and assessment submission

In order to successfully complete this unit and receive a minimum Pass grade, students must:

1. Attend and participate in all lectures, practicals, student presentations and class discussions;
2. Attend and participate in all days of the field trip;
3. Submit all assessments;
4. Meet the minimum level of achievement expected of a postgraduate student, as outlined in the General Assessment Criteria

Non-attendance may attract a penalty of up to 10 % of the final grade per day or an automatic fail, unless a valid reason with supporting documentation is provided.

Workload requirements

The workload for units at Macquarie University is based on a minimum of 3 hours per credit point per week to receive a Pass grade (including 13 x weeks of semester and 2 x weeks of mid-semester break). For this unit, this means that you are expected to spend at least 12 hours per week, or a total of around 150 hours on course learning activities.

A guide of the hours required to receive a Pass grade is outlined below. However, keep in mind that grades are awarded based on a demonstration of understanding and ability, not on effort! Approximately one third of the course is face-to-face in the class, field or online, while the remaining two-thirds is to be spent on individual study, primarily to complete the assessments and undertake further reading related to the course.

Activity	Hours per semester	Percentage allocation
Lectures, practical exercises, feedback sessions, student presentations	30	20%
Field trip	20	13 %
Individual study: completion of assessments and additional reading	100	67 %
Total	150	100 %

Unit Grading

In this unit, it is expected that your assessments will be very high quality and demonstrate comprehension of course content including knowledge, skills and abilities which are at the standard of a postgraduate level. Grades for the unit as a whole will be awarded according to the Macquarie University Assessment Policy Schedule 1, as outlined below.

ASSESSMENT GRADES AND STATUS

GRADE	RANGE	STATUS ('Standard Grade' in AMIS)	DESCRIPTION
HD	85-100	Pass	Provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality, insight or creativity in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application as appropriate to the program.
D	75-84	Pass	Provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality or creativity in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the program and the audience.
CR	65-74	Pass	Provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; convincing argumentation with appropriate coherent justification; communication of ideas fluently and clearly in terms of the conventions of the program.
P	50-64	Pass	Provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the program; routine argumentation with acceptable justification; communication of information and ideas adequately in terms of the conventions of the program. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.
F	0-49	Fail	Does not provide evidence of attainment of learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; missing, undeveloped, inappropriate or confusing argumentation; incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the program.

Unit Homepage

This unit has a home page that can be accessed through the Macquarie University online facility (ilearn.mq.edu.au). The iLearn page will be used to circulate information and other materials related to the course, field trip and assessments. The page also includes a discussion board where students can pose questions to the convenor and generate discussion with other students.