

ENVS1001: Environmental Science Concepts and Methods

Callaghan and Ourimbah

Semester 1 - 2024



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description The earth is facing unprecedented human-induced pressures that threaten the functioning of our ecosystems. Environmental Science attempts to explain how life on Earth is sustained, what contributes to our many environmental problems, and how these problems can be solved. Environmental Science & Management stands at the interface between humans and the Earth and explores the interactions and relations between them. This course introduces students to a number of the basic multidisciplinary concepts which are fundamental to understanding these interrelationships. Students will explore the methods which environmental scientists use in monitoring, measuring and assessing environmental variables. The course develops a firm understanding of scientific principles as applied to these variables and the necessary grounding for continuing studies in the Environmental Sciences.

Academic Progress Requirements

Nil

Requisites

This course replaces ENVS1060. If you have successfully completed ENVS1060 you cannot enrol in this course.

Contact Hours

Callaghan

Lecture

Face to Face On Campus

2 hour(s) per week(s) for 13 week(s) starting Week 1

Practical *

Face to Face On Campus

3 hour(s) per week(s) for 13 week(s) starting Week 1

Ourimbah

Lecture

Face to Face On Campus

2 hour(s) per week(s) for 13 week(s) starting Week 1

Practical *

Face to Face On Campus

3 hour(s) per week(s) for 13 week(s) starting Week 1

* This contact type has a compulsory requirement.

Unit Weighting

10

Workload

Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

www.newcastle.edu.au

CRICOS Provider 00109J

CONTACTS

Course Coordinator	Callaghan and Ourimbah A/Prof. Troy Gaston Troy.Gaston@newcastle.edu.au (02) 4349 4569 Consultation: By appointment
Teaching Staff	Other teaching staff will be advised on the course Canvas site.
School Office	School of Environmental and Life Sciences Room C228 Chemistry Building, Callaghan CESE-SELS@newcastle.edu.au (02) 4921 5080 9am-5pm (Mon-Fri)
	School of Environmental and Life Sciences SO-104 Science Offices, OURIMBAH CESE-SELS@newcastle.edu.au (02) 4349 4568 / 4348 4115 9am-5pm (Mon-Fri)

SYLLABUS

Course Content	This course introduces students to the key concepts and methods of environmental science. Topics will be selected from: <ul style="list-style-type: none">• Introduction to the interdisciplinary nature of environmental science and fundamental issues in environmental science, including climate change, pollution, sustainability;• Introduction to spatial science and its role in the environmental sciences;• Biodiversity and conservation of terrestrial systems;• Introduction to marine, estuarine and freshwater systems, including contemporary issues and mitigation measures;• Introduction to the Earth's physical systems, such as weathering and soil formation;• Earth's atmosphere and climate, global warming and climate change;• Social and indigenous environmental issues;• Environmental variables, their monitoring, measurement and assessment;• Sample and specimen collection, sampling strategies, field observation and skills and fundamental laboratory techniques;• Basic data manipulation, interpretation, analysis and communication of results;
Course Learning Outcomes	On successful completion of this course, students will be able to: <ol style="list-style-type: none">1. Summarise core and fundamental knowledge of concepts and methods appropriate to environmental science;2. Monitor, measure and assess a variety of environmental variables;3. Apply methods to sample and specimen collection, field observation, recording, laboratory techniques and experimental design;4. Manipulate data, interpret trends, analyse and communicate results associated with the measurement of environmental variables;
Course Materials	Recommended Reading: <ul style="list-style-type: none">- Withgott J and Brennan S. Environment: The Science Behind the Stories (any edition). Prentice and Hall- Withgott J and Laposasta M (2015). Environment: The Science Behind the Stories (Global Edition). Pearson- Jones A, Duck R, Reed R and Weyers J (1999). Practical Skills in Environmental Science. Pearson Prentice Hall

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

- Laboratory / Practical attend a minimum of 80% of sessions.

Compulsory Placement and WHS Requirements:

- Practical Induction Requirement - Students must attend and pass the induction requirements before attending these sessions. In order to participate in this course, students must complete a compulsory safety induction.

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	What is environmental science? Fundamental issues in environmental science	Key issues in environmental science (Group Activity) Introduction to Spatial Science	Laboratory Induction
2	4 Mar	Earth's atmosphere and climate	Environmental monitoring - field trip	
3	11 Mar	Earth's physical systems: weathering and soils	Sediment characteristics	Online Quiz 1 (5%, midnight Sunday 17 March)
4	18 Mar	Freshwater systems	Laboratory testing of water samples	
5	25 Mar	Biodiversity and conservation	Ourimbah - Environmental monitoring - how to sub-sampling (face-to-face) Callaghan - Mapping and desktop resources (online)	Practical Exercise 1 (10%, midnight Sunday 31 March)
6	1 Apr	No lecture - Easter Monday	Callaghan - Environmental monitoring - how to sub-sampling (face-to-face) On - Mapping and desktop resources	
7	8 Apr	Coastal, marine and estuarine systems	Properties of water	Online Quiz 2 (5%, midnight Sunday 14 April)
Mid-Semester Recess				
Mid-Semester Recess				
8	29 Apr	Microbes in the environment	Revision Practical Session	
9	6 May	Terrestrial ecosystems	Vegetation monitoring	Practical Exercise 2 (10%, midnight Sunday 12 May)
10	13 May	Environmental toxicology and risk assessment	Biological indicators of water quality	
11	20 May	Environmental contaminants	Ecotoxicology	
12	27 May	Social and indigenous issues in environmental science	Investigating community perceptions	Online Quiz 3 (5%, midnight Sunday 2 June)
13	3 Jun	Course Review	Practical Exam	Practical Exam (20%) - held during your normal scheduled practical time
Examination Period				
Examination Period				

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Practical exercises in the lab and field written assignments based on practical activities	Practical Exercise 1 is due Week 5 (midnight Sunday 31 March) and Practical Exercise 2 is due Week 9 (midnight Sunday 12 May).	Group	20%	2, 3, 4
2	Formal Examination	Undertaken during the Formal Examination Period: 11 - 22 June	Individual	45%	1
3	On-line Quizzes	Quizzes will become available in Week 3 (11 March), Week 7 (8 April) and Week 12 (27 May) after the lecture. Each quiz will remain open for one (1) week.	Individual	15%	1, 2
4	Practical examination based on practical activities	The Practical Examination will be undertaken during your scheduled practical time and location in Week 13.	Individual	20%	2, 3, 4

Late Submissions

The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

Assessment 1 - Practical exercises in the lab and field written assignments based on practical activities

Assessment Type

Tutorial / Laboratory Exercises

Purpose

The practical exercises demonstrate a student's understanding of Course Learning Objectives 2, 3 and 4. These refer to the monitoring and measurement of environmental variables, in both field and laboratory settings, and communication of results. Practical work will be conducted in a group; however, assessments will be undertaken individually.

Description

Practical Exercise 1 is a short report based on the site visit and the analysis and interpretation of samples. Practical Exercise 2 is an online assessment based on data collection and interpretation. Each assessment is worth 10%.

Weighting

20%

Length

Practical Exercise 1 - 1000 words

Due Date

Practical Exercise 1 is due Week 5 (midnight Sunday 31 March) and Practical Exercise 2 is due Week 9 (midnight Sunday 12 May).

Submission Method

Online

Assessments will be submitted via Canvas

Assessment Criteria

Criteria for each assessment will be available on Canvas

Return Method

Online

Feedback Provided

Online - Feedback on the practical exercises will be provided online but also in a timetabled session. Students will have the opportunity to ask questions.

Opportunity to Reattempt

Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 - Formal Examination

Assessment Type	Formal Examination
Purpose	The Formal Examination is designed to test the individual student's knowledge of the fundamental concepts of environmental science and their ability to describe and interpret these concepts. The Formal Examination is prepared in accordance with the Course Management and Assessment Procedure Manual.
Description	The Formal Examination is a series of multiple choice and short answer questions relating to the material covered in lectures.
Weighting	45%
Length	Two (2) hours
Due Date	Undertaken during the Formal Examination Period: 11 - 22 June
Submission Method	Formal Exam
Assessment Criteria	Core and fundamental knowledge of environmental science concepts and methods using multiple choice and short answer questions.
Return Method	Not Returned
Feedback Provided	No Feedback.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - On-line Quizzes

Assessment Type	Quiz
Purpose	The purpose and benefit of regular quizzes is to provide the student with regular feedback on their learning. These quizzes highlight fundamental areas of environmental science and may stimulate discussion with tutors and academic staff.
Description	Three (3) Online Quizzes will be available via Canvas course site. Each quiz is ten (10) multiple choice and or short answer questions that are drawn from a larger pool of questions. Each quiz is worth 5%.
Weighting	15%
Length	Each quiz consists of ten (10) questions
Due Date	Quizzes will become available in Week 3 (11 March), Week 7 (8 April) and Week 12 (27 May) after the lecture. Each quiz will remain open for one (1) week.
Submission Method	Online
Assessment Criteria	Core and fundamental knowledge of environmental science concepts and methods using multiple choice and short answer questions.
Return Method	Online
Feedback Provided	Online - Students will receive their grade and feedback on questions once their quiz has been submitted.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 4 - Practical examination based on practical activities

Assessment Type	In Term Test
Purpose	The purpose and benefit of the Practical Examination is to assess the student's ability to undertake, critically analyse and solve scientific problems using laboratory and field-based methods.
Description	The material covered in practical sessions will be examined through practical exercises and short answer questions under examination conditions. The Practical Exam demonstrates a student's understanding of Course Learning Objectives 2, 3 and 4.
Weighting	20%
Due Date	The Practical Examination will be undertaken during your scheduled practical time and location in Week 13.
Submission Method	In Class
Assessment Criteria	Competency in the methods used for monitoring, measurement and assessment of environmental variables using short answer questions and practical exercises.
Return Method	Not Returned
Feedback Provided	No Feedback.
Opportunity to Reattempt	Students WILL be given the opportunity to reattempt this assessment.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Attendance

Attendance/participation will be recorded in the following components:

- Practical (Method of recording: Check in with UoN app and scan your student card upon entry to the laboratory.)

WH&S Requirements

The issue of safety for staff and students is taken very seriously by the University. Students in this course will be using equipment and/or processes with the potential to cause harm and are required to undertake a safety induction and abide by all safety guidelines. The Safety Induction will occur during Week 1 of the course and prior to any field and laboratory activities. Students will be advised of Risk Assessment and H & S requirements by the Course Coordinator at the beginning of the semester.

Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment.

Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at <https://policies.newcastle.edu.au/document/view-current.php?id=236>.

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at <https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures> that support a safe and respectful environment at the University.

Other Information

There may be a cost (up to \$15) for the field trip. More details provided on Canvas.

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.

© 2024 The University of Newcastle, Australia