

ECON3128

Resource and Environmental Economics

Semester 2, 2018

In many economic situations, the incentives of individual agents are not aligned with the objective of attaining aggregate economic efficiency, or the maximisation of social welfare. Such situations often lead to market failures that are characterised by environmental degradation or the overexploitation of natural resources.

This course analyses the economic principles underlying the design of efficient environmental policies and the optimal management of natural resources. It identifies conditions under which market failures lead to environmental degradation or the overexploitation of natural resources, and discusses economic policies that can counteract such market failures. Such policies include imposing taxes on certain economic activities, or allocating property rights that allow these activities to be undertaken. If property rights—which may take the form of pollution permits, or individual quotas for the harvesting of natural resources—are transferable between agents, the trade of property rights between self-interested agents yields economic efficiency as a market-based outcome.

Mode of Delivery	On campus
Prerequisites	As listed in <i>Programs and Courses</i>
Incompatible Courses	As listed in <i>Programs and Courses</i>
Co-taught Courses	ECON8040 Graduate students attend joint classes with undergraduates but are assessed separately.
Course Convener and Lecturer	Ronald Stauber
Email	ronald.stauber@anu.edu.au
Office hours for student consultation	TBA, see the course Wattle page
Research Interests	Game Theory, Microeconomic Theory

Learning Outcomes

Upon a successful completion of this course, students should be able to:

- Understand how various market failures may lead to environmental degradation or the overexploitation of natural resources;
- Use economic modelling to evaluate various approaches to the design of efficient environmental policies and of rules for the optimal management of natural resources;
- Construct and analyse simple dynamic models of natural resource management.

Research-Led Teaching

The course covers concepts, methodologies and techniques that form the foundation of modern research in resource and environmental economics.

Lectures and Tutorials

Tuesday, 5-7pm, CBE Building LT3

Friday, 4-6pm, CBE Building LT3

Lectures and tutorials will all take place during the two time slots listed above. **No tutorial signup is required for this course.**

Students are expected to regularly attend all lectures and tutorials. Lecture recordings are not a substitute for regular class attendance, and taking a photo of a graph drawn on the whiteboard does not have the same learning effect as personally drawing your own graphs and taking your own notes. Students from past years who chose not to attend classes have almost always failed this course!

Assessment Summary

1. Tutorial presentations and participation: 10%
2. Midterm exam: 30% (redeemable)
3. Final exam: 60%

Examinations

The mid-semester exam will most likely be scheduled during week 7 of the semester (after the mid-semester break), subject to confirmation by the University Examinations Office. The mid-semester exam is both fully redeemable and optional. No deferred or make-up exam will be offered in case you miss the mid-semester exam. If your percentage mark on the final exam is higher than on the mid-semester exam, or if you do not sit the mid-semester exam, the final exam will count for 90% of your grade. The final exam will cover all topics discussed during the semester.

Tutorial Presentations

The tutorial problems corresponding to each week's lectures will be discussed in the associated tutorials, usually during the following week. Students are required to form groups of two or three members, and prepare solutions for the tutorial problems together with their group members before attending the tutorials. During the tutorials, groups can either volunteer to present one of the problems, or I will randomly assign a group to present a problem if there are no volunteers or if some groups never present voluntarily. All groups should expect to present an approximately equal number of problems throughout the semester.

The tutorial problems are designed to challenge you to think carefully about the theoretical concepts discussed in lectures, and to teach you how to apply these concepts in the context of specific examples. Do not get discouraged if you find some of the problems to be challenging. If you get stuck, start by reviewing the lecture material, and try to identify how the theoretical constructs from the lectures relate to the problems. You have only learned the theory if you understand it well enough so that you can apply it to an unfamiliar example.

10% of the total marks for the course will be assigned based on tutorial presentations and participation in the presentations of other groups. While presentation marks will be assigned based mainly on effort, and some help may be provided during the presentations, you will be

expected to demonstrate that you have carefully revised the relevant lecture material and that you understand how it is applied in the tutorial problems.

Course Schedule

1. Introduction; Economic efficiency
2. Environmental externalities
3. Pollution abatement as a public good
4. Cost-benefit analysis of environmental policies
5. Modelling dynamical systems
6. Common-pool resources
7. The economics of renewable resources
8. Non-renewable resources

A more detailed course outline and schedule will be available on the course Wattle site. Furthermore, all relevant course materials will be posted on the Wattle site, which will contain a list of topics covered, associated readings, lecture slides and tutorial problems. This list will be updated throughout the semester, and will also include information about exam times and locations. I will attempt to post the lecture slides used in class before each lecture. Please print out a copy of these slides and bring them to class. Note that the slides will be incomplete and will not contain various graphs and explanations, which will be developed using the whiteboard, so **you should not expect to be able to follow the lectures without attending class.**

Prerequisites and Preliminary Reading

In order to enrol in this course, you must have completed ECON2101/ECON2111— Microeconomics 2 (P or H). Moreover, you should possess basic mathematical skills, such as being able to **solve algebraic equations, graph functions, and take derivatives and partial derivatives**. Additional formal techniques for constructing and analysing dynamic models will be developed as part of the course.

The book by William Nordhaus listed below as an additional reference provides background and motivation for many of the issues that will be discussed during the semester, and would thus be useful preliminary reading.

Recommended Resources

Textbook

- N.O. Keohane and S.M. Olmstead, *Markets and the Environment*, Island Press, 2007 (2nd edition 2016):
<http://library.anu.edu.au/record=b4890535> [e-book, 2nd edition] or
<http://library.anu.edu.au/record=b2345710>

The textbook provides an excellent basic discussion and overview of the topics that will be covered during the semester. **The lectures will build and expand on the textbook material by providing a more rigorous analysis of the corresponding economic principles and methods.** The lectures will draw on the following references:

Additional references

- William D. Nordhaus, *The Climate Casino: Risk, Uncertainty, and Economics for a Warming World*, Yale University Press, 2013:
<http://library.anu.edu.au/record=b3483088>
- Hal. R. Varian, *Intermediate Microeconomics with Calculus*, W.W. Norton, 2014:
<http://library.anu.edu.au/record=b3573717>
- R. Serrano and A.M. Feldman, *A Short Course in Intermediate Microeconomics with Calculus*, Cambridge University Press, 2013:
<http://library.anu.edu.au/record=b3573715>
<http://library.anu.edu.au/record=b3732344> [scanned pdf chs. 17-18]
- A.M. Feldman and R. Serrano, *Welfare Economics and Social Choice Theory*, 2nd edition, Springer, 2005:
<http://library.anu.edu.au/record=b2787744> [e-book]
- J. Hindriks and G.D. Myles, *Intermediate Public Economics*, 2nd edition, MIT Press, 2013:
<http://library.anu.edu.au/record=b3426451> [e-book]
- P. Blanchard, G.R. Hall and R.L. Devaney, *Differential Equations*, 3rd edition, Brooks/Cole, 2006:
<http://library.anu.edu.au/record=b3578494> [scanned pdf ch. 1]
- Colin W. Clark, *The Worldwide Crisis in Fisheries: Economic Models and Human Behavior*, Cambridge University Press, 2006:
<http://library.anu.edu.au/record=b3586891> [e-book]
- Jon M. Conrad, *Resource Economics*, 2nd edition, Cambridge University Press, 2010:
<http://library.anu.edu.au/record=b3573713> or
<http://library.anu.edu.au/record=b3299701> [e-book, previous edition!]

Feedback

Staff Feedback

Students will be given feedback in the forms of verbal feedback during and after lectures and tutorials, and individual feedback and help with lecture material and tutorial problems, as well as discussions of solutions to midterm examination problems, during office hours.

Student Feedback

ANU is committed to the demonstration of educational excellence and regularly seeks feedback from students. One of the key formal ways students have to provide feedback is through Student Experience of Learning Support (SELS) surveys. The feedback given in these surveys is anonymous and provides the Colleges, University Education Committee and Academic Board with opportunities to recognise excellent teaching, and opportunities for improvement.

For more information on student surveys at ANU and reports on the feedback provided on ANU courses, go to

[http : //unistats.anu.edu.au/surveys/selt/students/](http://unistats.anu.edu.au/surveys/selt/students/) and

[http : //unistats.anu.edu.au/surveys/selt/results/learning/](http://unistats.anu.edu.au/surveys/selt/results/learning/)

Policies

ANU has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and implement them. You can find the University's education policies and an explanatory glossary at: [http : //policies.anu.edu.au/](http://policies.anu.edu.au/)

Students are expected to have read the [Academic Misconduct Rule](#) before the commencement of their course.

Other key policies include:

- Student Assessment (Coursework)
- Student Surveys and Evaluations

Assessment Requirements

The ANU is using Turnitin to enhance student citation and referencing techniques, and to assess assignment submissions as a component of the University's approach to managing Academic Integrity. Assignments are submitted using Turnitin in the course Wattle site. You will be required to electronically sign a declaration as part of the submission of your assignment. Please keep a copy of the assignment for your records. For additional information regarding Turnitin please visit the [ANU Online](#) website.

Students may choose not to submit assessment items through Turnitin. In this instance you will be required to submit, alongside the assessment item itself, copies of all references included in the assessment item.

As a further academic integrity control, students may be selected for a 15 minute individual oral examination of their written assessment submissions.

Any student identified, either during the current semester or in retrospect, as having used ghost writing services will be investigated under the University's Academic Misconduct Rule.

Extensions and Penalties

Extensions and late submission of assessment pieces are covered by the Student Assessment (Coursework) Policy and Procedure.

The Course Convener may grant extensions for assessment pieces that are not examinations or take-home examinations. If you need an extension, you must request it in writing on or before the due date. If you have documented and appropriate medical evidence that demonstrates you were not able to request an extension on or before the due date, you may be able to request it after the due date.

No submission of assessment tasks without an extension after the due date will be permitted. If an assessment task is not submitted by the due date, a mark of 0 will be awarded.

Scaling

Your final mark for the course will be based on the **raw** marks allocated for each of your assessment items. However, your final mark may not be the same number as produced by that formula, as marks may be **scaled**. Any scaling applied will preserve the rank order of raw marks (i.e. if your raw mark exceeds that of another student, then your scaled mark will exceed the scaled mark of that student), and may be either up or down.

Privacy Notice

The ANU has made a number of third party, online, databases available for students to use. Use of each online database is conditional on student end users first agreeing to the database licensor's terms of service and/or privacy policy. Students should read these carefully.

In some cases student end users will be required to register an account with the database licensor and submit personal information, including their: first name; last name; ANU email address; and other information.

In cases where student end users are asked to submit 'content' to a database, such as an assignment or short answers, the database licensor may only use the student's 'content' in accordance with the terms of service – including any (copyright) licence the student grants to the database licensor.

Any personal information or content a student submits may be stored by the licensor, potentially offshore, and will be used to process the database service in accordance with the licensors terms of service and/or privacy policy.

If any student chooses not to agree to the database licensor's terms of service or privacy policy, the student will not be able to access and use the database. In these circumstances students should contact their lecturer to enquire about alternative arrangements that are available.

Support for Students

The University offers a number of support services for students. Information on these is available online from [http : //students.anu.edu.au/studentlife/](http://students.anu.edu.au/studentlife/)