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ONLINE RESOURCES
Further information about this unit (including a copy of this unit outline) may be obtained from WebCT

INTRODUCTION
The unit comprises weeks 1-3 and weeks 8-13 of the unit ECON3301 Environmental and Resource Economics. These cover two modules:

1. A natural resource economics module (part of ECON3301) which analyses the optimal management of renewable resources including fisheries, forests and non-renewable resources such as oil and minerals. The first module focuses on how to manage a natural resource so that the flows of benefits (both private and social) are maximized.

2. An environmental policy module (part of ECON3301) which focuses on policy instruments for the regulation of natural resource uses and pollution control. The second module considers governments' efforts in regulating or influencing private resource managers through measures that provide direction through legislation or through the use of negative or positive incentives. Several such instruments are compared and evaluated.

The third module of this unit is:

3. A module that covers the Mining Act and Mines Safety and Health Act; duties of care; roles and responsibilities; environmental and native title issues; and occupational health and safety. This module will comprise an opening and closing lecture (Thu 8 Sep and Thu 20 Oct), but otherwise it is organised as self-study material that you are expected to complete during weeks 4-7 of semester.
### Generic Learning Outcomes

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<tr>
<th>Outcome</th>
<th>Assessment Activity</th>
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| Students who successfully complete this unit should **further** develop: | Tutorials  
Assignments  
Examination |
| - in-depth technical competence in at least one engineering discipline | |
| - ability to undertake problem identification, formulation and solution | |
| - ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member | |
| - understanding of the social, cultural, global and environmental responsibilities of professional engineering, and the need for sustainable development | |
| - understanding of the principles of sustainable design and development | |
| - understanding of professional and ethical responsibilities and commitment them | |
| - expectation of the need to undertake lifelong learning, and capacity to do so. | |

### Specific Learning Outcomes

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<th>Outcome</th>
<th>Assessment Activity</th>
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| On completion of this unit students should be able to: | Tutorials  
Assignments  
Examination |
| - Understand the fundamental sources of market failure and environmental problems (e.g. pollution and biodiversity losses) | |
| - Formulate pollution control and resource management problems as optimization problems where benefits and costs are balanced and define the necessary conditions for the optimal outcomes | |
| - Identify and compare the range of policy instruments that are available to influence how private resource managers utilize the environment or natural resources (renewable and non-renewable) | |
| - Develop an understanding of reforms and innovations relating to the use of policy instruments in Australia and around the world | |
| - Display **knowledge** of the *Mining Act and Mines Safety and Health Act*; duties of care; roles and responsibilities; case histories; environmental and native title issues; occupational health and safety: principles; application to the mineral industry and to mine sites in particular | |

### Assessment Mechanism Statement

Assessment consists of assignments and an examination. Final grading of the unit is based on this semester only. No supplementary assessment will be available for the unit. Final unit marks may be modified in accordance with Faculty policy (see [http://www.ecm.uwa.edu.au/for/students/assess](http://www.ecm.uwa.edu.au/for/students/assess)).

<table>
<thead>
<tr>
<th>Assessment (subject to change)</th>
<th>Contribution</th>
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<tbody>
<tr>
<td>1 Assignments</td>
<td>TBA</td>
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<tr>
<td>2 Final examinations</td>
<td>TBA</td>
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## Lecture and tutorial schedule (liable to change)

<table>
<thead>
<tr>
<th>Semester Weeks</th>
<th>Topics</th>
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<tr>
<td><strong>MODULE 1 – Natural Resource Management (August 01 – September 16)</strong></td>
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| **Week 1** 01/08-05/08 | Natural Resource Economics - Introduction  
Math revisions 1  
Math revisions 2  
*No tutorial during first week of semester* |
| **Week 2** 08/08-12/08 | Discounting - decision making over time  
Non-renewable resource economics - Discrete time Hotelling’s rule for competitive market  
Non-renewal resource economics - Discrete time Hotelling’s rule for monopolistic market  
*Tutorial 1: Review of basic calculus and optimisation* |
| **Week 3** 15/08-19/08 | Non-renewal resource economics - Continuous time Hotelling’s rule and comparative dynamics  
Hotelling’s rule, extensions and resource royalty  
Resource royalty and taxation  
*Tutorial 2: Discounting and discount rate*  
Distribution of self-study material for module 3 |
| **Week 4** 22/08-26/08 | Common property resources  
Renewal resource economics (fisheries and forests) - Biological growth and harvesting  
Economic model of fishery: Gordon-Schaefer static model  
*Tutorial 3: Economics of non-renewable resource* |
| **Week 5** 29/08-02/09 | Dynamic model of fishery  
Fisheries policy and management in Australia/Western Australia  
Introduction to forest economics  
*Tutorial 4: Economics of renewable resource - fishery* |
| **Week 6** 05/09-09/09 | Economic model of forestry (single use) – Faustmann model  
Economic model of forestry (multiple use) – Hartman model  
Quiz 1 (Thursday, September 8)  
*No tutorial session this week*  
Opening lecture from Trevor Little for Module 3 |
| **Week 7** 12/09-16/09 | Forest policy and management in Australia/Western Australia  
Introduction to ecosystem services  
Ecosystem service – measurement and applications  
*Tutorial 5: Economics of renewable resource - forestry* |
| **MODULE 2 – Environmental Policy (September 19 – November 4)** |
| **Week 8** 19/09-23/09 | Resource allocation and market efficiency, Market failure and environmental problems,  
Optimal level of pollution abatement, Cost-effectiveness and the equimarginal principle  
*No tutorial during first week of module* |
| **Week 9** 03/10-07/10 | Policy instruments for pollution control (emission charges, tradable permits),  
instruments for non-point source pollution control  
*Tutorial 7: Abatement costs* |
| **Week 10** 10/10-14/10 | Biodiversity conservation, conservation auctions, flexible conservation auctions (multi-unit auctions and combinatorial auctions)  
*Tutorial 8: Optimal abatement: emission taxes* |

**STUDY BREAK WEEK**
| Week 11 | 17/10-21/10 | Choice of policy instruments, policy instruments in practice, climate change policies  
No tutorial session this week  
Closing lecture from Trevor Little for Module 3 |
| Week 12 | 24/10-28/10 | Nonmarket valuation methods  
Quiz 2 (Thursday, Oct. 27)  
Tutorial 9: Cost-efficient abatement, emission taxes and tradable permits |
| Week 13 | 31/10-04/11 | Nonmarket valuation methods (continued)  
Tutorial 10: Auctions and price discovery |

**RECOMMENDED READING**

The following recommended readings for the unit have been put on reserve in the Science Library. The first has also been ordered through the co-op book shop as a textbook.


**IMPORTANT INFORMATION**

- Students should be aware of the University guidelines on Academic Misconduct (see [http://www.ecm.uwa.edu.au/for/students/plagiarism](http://www.ecm.uwa.edu.au/for/students/plagiarism))
- Students should be aware of the Faculty Policy for Appeals (see [http://www.ecm.uwa.edu.au/for/students/exams](http://www.ecm.uwa.edu.au/for/students/exams))
- Students should be aware of the Charter of Student Rights (see [http://www.secretariat.uwa.edu.au/home/policies/charter](http://www.secretariat.uwa.edu.au/home/policies/charter))