

**PHYS2300: Climate and Energy**

Online

Semester 1 - 2024



## OVERVIEW

<b>Course Description</b>	The global effects of climate change associated with the reliance on fossil fuels for our energy needs are among some of the most challenging problems facing the world today. In this course, students will develop an understanding of the physical principles behind the greenhouse effect and the observational evidence for its existence. They will investigate the scientific principles relevant to energy and energy resources, including aspects such as thermal, nuclear, solar, wind and hydroelectric power generation. The prospects and challenges for a transition away from fossil fuels will be evaluated. This course is suitable for any student interested knowing more about the science of climate change and the possible routes for a transition to an emissions free energy sector.
<b>Academic Progress Requirements</b>	Nil
<b>Requisites</b>	This course replaces ENVS2040 and ENVS2001. If you have successfully completed ENVS2040 or ENVS2001, you cannot enrol in this course.
<b>Assumed Knowledge</b>	Arithmetic and algebra up to and including logarithmic and exponential functions. Knowledge of calculus is not required.
<b>Contact Hours</b>	<b>Online</b> <b>Online Activity</b> Online 1 hour(s) per week(s) for 13 week(s) starting Week 1
<b>Unit Weighting Workload</b>	10 Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

# COURSE OUTLINE

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# CONTACTS

<b>Course Coordinator</b>	<b>Online</b> A/Pr Vicki Keast Vicki.Keast@newcastle.edu.au (02) 4921 6653 Consultation: Weekly Zoom Office Hour - see Canvas
<b>Teaching Staff</b>	Other teaching staff will be advised on the course Canvas site.
<b>School Office</b>	<b>School of Information and Physical Sciences</b> SR233, Social Sciences Building Callaghan CESE-SIPS-Admin@newcastle.edu.au +61 2 4921 5513 9am-5pm (Mon-Fri)

# SYLLABUS

<b>Course Content</b>	<ul style="list-style-type: none"><li>• Energy, power and the role of thermodynamics</li><li>• The greenhouse effect: science, evidence, models and impacts</li><li>• Electricity: generation, transmission and storage</li><li>• Fossil fuels for electricity and transport: the challenges for their replacement</li><li>• Alternative energies for electricity and transport: nuclear; solar; wind; hydroelectricity; geothermal and hydrogen</li></ul>
<b>Course Learning Outcomes</b>	<p><b>On successful completion of this course, students will be able to:</b></p> <ol style="list-style-type: none"><li>1. Qualitatively describe and quantitatively analyse energy, power and thermodynamics</li><li>2. Apply scientific concepts to describe the greenhouse effect and its impacts on the climate system</li><li>3. Describe and perform simple calculations relevant to the generation of electricity, its transmission and storage</li><li>4. Compare and contrast the different types of energy sources used for electricity, transport and storage</li><li>5. Critically assess and discuss the reporting of energy issues in the media</li></ol>
<b>Course Materials</b>	<b>Lecture Materials:</b> <ul style="list-style-type: none"><li>- See Canvas</li></ul>

# 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	Formal Examination	Formal Examination Period	Individual	40%	3, 4
2	Online Quizzes	Weekly	Individual	20%	1, 2, 3
3	Online Learning Activity	Participation and initiation of discussion in an online Discussion Forum	Individual	10%	5
4	Written Assignment	Assignment 1. Monday 5pm Week 7. Assignment 2. Monday 5pm Week 13.	Individual	30%	1, 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 - Formal Examination

<b>Assessment Type</b>	Online Open Book Formal Examination
<b>Purpose</b>	To examine knowledge and understanding of climate and energy related issues as covered during the course and outlined in the syllabus.
<b>Description</b>	A 2 hour final exam during the formal examination period
<b>Weighting</b>	40%
<b>Length</b>	2 hours
<b>Due Date</b>	Formal Examination Period
<b>Submission Method</b>	Formal Exam
<b>Assessment Criteria</b>	Correct answers to multiple choice and calculation questions
<b>Return Method</b>	Not Returned
<b>Feedback Provided</b>	No Feedback - .
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## Assessment 2 - Online Quizzes

<b>Assessment Type</b>	Quiz
<b>Purpose</b>	To review weekly topics as covered in the lectures.
<b>Description</b>	1. Answer weekly multiple choice questions in a Canvas Quiz. 2. Generate and answer weekly multiple choice questions in Peerwise
<b>Weighting</b>	20%
<b>Length</b>	As required
<b>Due Date</b>	Weekly
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	1. Canvas Quizzes - Correct answers to Multiple Choice Questions 2. Peerwise - Participation
<b>Return Method</b>	Not Returned
<b>Feedback Provided</b>	No Feedback - .
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## Assessment 3 - Online Learning Activity

<b>Assessment Type</b>	Online Learning Activity
<b>Purpose</b>	To relate course content to topical issues in the world media and to engage in deeper discussions with peers around climate and energy issues.
<b>Description</b>	Participation and initiation of discussion in an online Discussion Forum
<b>Weighting</b>	10%
<b>Length</b>	As needed
<b>Due Date</b>	Weekly
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Participation
<b>Return Method</b>	Not Returned
<b>Feedback Provided</b>	No Feedback - .
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## Assessment 4 - Written Assignment

<b>Assessment Type</b>	Written Assignment
<b>Purpose</b>	Demonstrate quantitative and qualitative reasoning on climate and energy issues
<b>Description</b>	Written assignment with numerical and word based questions.
<b>Weighting</b>	30%
<b>Length</b>	As required
<b>Due Date</b>	Assignment 1. Monday 5pm Week 7. Assignment 2. Monday 5pm Week 13.
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correct answers provided to quantitative and qualitative questions. Partial marks may be awarded for correct method for working out, even when final answer is incorrect.
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Online - Online - 2 weeks after submission.
<b>Opportunity to Reattempt</b>	Students WILL NOT 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).

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<b>Communication Methods</b>	Communication methods used in this course include: <ul style="list-style-type: none"><li>- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.</li><li>- Email: Students will receive communications via their student email account.</li></ul>
<b>Course Evaluation</b>	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. As a result of student feedback, the following changes have been made to this offering of the course: <ul style="list-style-type: none"><li>- Assignment 2 has been modified to provide options depending on students prior learning background.</li></ul>
<b>Oral Interviews (Vivas)</b>	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 <a href="#">Oral Examination (viva) Procedure</a> . 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 <a href="#">Student Conduct Rule</a> .
<b>Academic Misconduct</b>	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 <a href="https://policies.newcastle.edu.au/document/view-current.php?id=35">https://policies.newcastle.edu.au/document/view-current.php?id=35</a> .
<b>Adverse Circumstances</b>	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: <ol style="list-style-type: none"><li>1. the assessment item is a major assessment item; or</li><li>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;</li><li>3. you are requesting a change of placement; or</li><li>4. the course has a compulsory attendance requirement.</li></ol> Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at: <a href="https://policies.newcastle.edu.au/document/view-current.php?id=236">https://policies.newcastle.edu.au/document/view-current.php?id=236</a>
<b>Important Policy Information</b>	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 <a href="https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures">https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures</a> that support a safe and respectful environment at the University.

*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.*

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