

# AGEN 7002 ECOSYSTEMS IN A CHANGING WORLD

**Credit Points** 10

**Legacy Code** 800170

**Coordinator** Yolima Carrillo ([https://directory.westernsydney.edu.au/search/name/Yolima Carrillo/](https://directory.westernsydney.edu.au/search/name/Yolima%20Carrillo/))

**Description** Natural and managed ecosystems on our planet are experiencing a rapidly changing environment as a consequence of changing patterns of land and resource use, loss of biodiversity, altered atmospheric composition and anthropogenic climate change. This unit will introduce students to ecosystem concepts in the context of ecological and evolutionary responses to global change. Students will obtain practical experience in quantitative analysis of carbon, nutrient, water and energy budgets, and explore the consequences of global change for ecosystem services and biodiversity over a range of spatial and temporal scales. Teaching will be led by HIE staff with expertise in ecosystem responses to environmental change, soil microbial contributions to ecosystem function and the impacts of environmental change on plants, animals and their interactions.

**School** Graduate Research School

**Discipline** Agriculture, Environmental and Related Studies, Not Elsewhere Classified.

**Student Contribution Band** HECS Band 2 10cp

**Level** Postgraduate Coursework Level 7 subject

**Assumed Knowledge**

A Bachelor of Science in Biology, Environmental Science, or Agricultural Science, with some background in plant science and ecology.

## Learning Outcomes

On successful completion of this subject, students should be able to:

1. Quantitatively describe fundamental ecosystem functions
2. Solve problems mathematically on paper and in spreadsheets
3. Construct and interpret graphical representations of data
4. Apply systems approach to complex environmental issues
5. Critically discuss primary research articles on ecosystem responses to environmental change
6. Write critical evaluation of a primary research article

## Subject Content

Ecosystem concepts, introduction to global change  
 Geology and soils  
 Water and energy balance  
 Primary production and allocation  
 Carbon cycling  
 Nutrient cycling  
 Microbial ecology and ecosystem processes  
 Trophic dynamics; food webs and plant-animal interactions  
 Biodiversity and ecosystem function  
 Temporal dynamics: Disturbance, succession  
 Scaling from plots to the globe; landscape processes  
 Global change and ecosystems  
 Ecosystem management in a changing world

## Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Item	Length	Percent	Threshold	Individual/Group Task
Mathematical solutions to quantitative problems	5 sets and graphical	50	N	Individual
Class participation and blog posts	4 x 250 words	20	N	Individual
Short answer quizzes	3 x 30 minutes	30	N	Individual

**Prescribed Texts**

- Chapin, FS, Matson, PA & Vitousek, PM, 2012, Principles of terrestrial ecosystem ecology, 2nd edn, Springer, New York.

**Teaching Periods**

## Spring Hawkesbury Day

**Subject Contact** Yolima Carrillo ([https://directory.westernsydney.edu.au/search/name/Yolima Carrillo/](https://directory.westernsydney.edu.au/search/name/Yolima%20Carrillo/))

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=AGEN7002\\_22-SPR\\_HW\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=AGEN7002_22-SPR_HW_D#subjects))