

LEWIS & CLARK COLLEGE
AUSTRALIAN STUDIES PROGRAM 2017
Australian Natural History

Summary

The *Australian Natural History* course introduces students to basic concepts of ecology. The course then applies these concepts to a range of Australian terrestrial and marine ecosystems: mangroves; sandy, rocky and muddy shores; sub-tropical rainforest; coral reefs and dry sclerophyll forest. This approach emphasises the inter-specific relationships of Australian plants and animals and takes into account the evolutionary factors that have shaped the Australian environment. More often than not, the 'great outdoors' will be the classroom for this course and students will be encouraged to learn through practising field study techniques and developing and carrying out field research projects. Throughout the course there will be increasing focus on sustainability and use of resources, using site-specific examples throughout the program at Carnarvon Gorge, Brampton Island, Mackay and Lady Elliot Island.

Objectives

By the end of the course students should be able to:

- outline key factors which have impacted on the evolution of biota in Australia;
- explain some of the basic concepts of ecology and the way they relate to a selection of Australian ecosystems;
- describe some of the relationships between Australian plant and animal species in both terrestrial and marine ecosystems;
- identify aspects of the composition, structure and function of the following Australian ecosystems: sub-tropical rainforest, dry sclerophyll forest, sandy, rocky and muddy shores, mangrove forests, and coral reefs;
- apply techniques used for studying marine organisms in the field and used in trapping and handling small mammals for population survey purposes;
- define, plan and implement basic field research projects; and
- record and interpret field data and effectively communicate the results to others.

List of activities

Sydney and the Blue Mountains

- NH-V1** Australia's ancient terrestrial fauna
(video on the evolution and extinction of Australia's megafauna – 'The Future Eaters')
- NH-L1** Introduction to the Australian terrestrial biota
(taxonomy, origins, special features and adaptations, importance of abiotic environmental factors)
- NH-Ex1** Australian native fauna
(visit Taronga Park zoo)
- NH-Ex2** Evolution of Australian native plants
(visit Mount Annan Botanic Garden)
- NH-Ex3** Introduction to Australian natural and European history
(visit the World Heritage-listed Blue Mountains National Park, biodiversity and endemism, European settlement of the area)
- NH-Ex4** Introduction to natural and European history of Australia *(Visit Jenolan Caves)*
- NH-Ex5** Introduction to natural and European history of Australia *(Bushwalk in the Blue Mountains)*
- NH-L2** Introduction to Australian marine environments
(characteristics and factors affecting marine life: latitude, temperatures, currents, salinity, light, etc.)

South-East Queensland (Brisbane, North Stradbroke Island and Lamington Plateau)

- NH-Ex6** Mangrove forest ecology
(visit Myora Springs mangroves, North Stradbroke Island)
- NH-L3** Geology, hydrology and geomorphology of sand islands
(major geological features, estuarine and sheltered bay dynamics, formation of sand islands, soil structure, water table including lakes and swamps, impacts of water use)
- NH-L4** Botanical ecology of sand islands
(seagrass, dune vegetation, remnant rainforest, sclerophyll forest, wallum heath, mangroves, swamp, adaptations of botanical communities for sand island environments)
- NH-Ex7** Sand island ecology – Part I
(beaches, dune systems, lakes and vegetation of North Stradbroke Island)
 Sand island ecology – Part II
(rocky shores)

Key: **NH** = Natural History; **L** = Lecture; **Ex** = Excursion; **FT** = Field Trip; **D** = Discussion; **V** = Video

NH-V2	Video <i>Faces in the Mob</i>
NH-D	Discussion with maker of the video (<i>Social behaviour of animals</i>)
NH-L4	Organisation of biological communities (<i>general features of communities, resource partitioning, ecological niches, community structure and species diversity</i>)
NH-L5	Species interaction in biological communities (<i>predation, competition, mutualism, commensalism, amensalism</i>)
NH-L6	Introduction to Australian rainforests (<i>distribution, classification, uses, conservation</i>)
NH-L7	Field studies briefing (<i>introduction to field research design in ecology, sampling techniques and group research projects</i>)
NH-FT	Natural history of rainforests (<i>five day field trip to Lamington Plateau</i>)
NH-Ex8	Characteristics of rainforests – rainforest plants
NH-Ex9	Characteristics of rainforests – rainforest animals

Carnarvon Gorge National Park

NH-FT	Natural history of eucalypt forests (<i>five day field trip to Carnarvon Gorge</i>)
NH-Ex10	Adaptation of Australian plants to arid environments (<i>water collection and conservation, survival without water, predator resistance, fire</i>)
NH-L8	Fire in the ecology of Australian eucalypt forests (<i>incidence, nature, effects, plant and animal adaptations</i>)
NH-L9	Social behaviour of animals (<i>nature, evolution, function</i>)

Brampton Island, Cumberland group, Whitsunday Islands

NH-FT	Natural history of coral reefs (<i>five day field trip to Brampton Island</i>)
NH-L10	Introduction to Australian marine environments (<i>characteristics and factors affecting marine life: latitude, temperatures, currents, salinity, light, etc.</i>)
NH-Ex11	Biology of turtles (<i>walk and talk turtle watching</i>)
NH-L11	Introduction to the ecology of the invertebrate fauna of coral reef flats (<i>taxonomy, characteristics, special adaptations</i>)
NH-L12	Geology of coral reefs (<i>structure of reefs, method and history of their formation</i>)
NH-Ex12	Introduction to coral reef biota (<i>reef flat walk</i>)
NH-L13	Colonisation of islands by plants and animals (<i>sources of colonists, migration methods, post-immigration survival strategies, post-colonisation speciation</i>)
NH-Ex13	Colonisation of islands by plants and animals (<i>forms and distribution of plant propagules, animal immigration, sustaining humans</i>)
NH-L14	Reef management and threats (<i>management of the Great Barrier Reef; causes and effects of local [eutrophication, overfishing, development, etc] and global [rising sea temperatures, ocean acidification] threats on reefs</i>)

Lady Elliot Island, Great Barrier Reef

NH-FT	Natural history of coral reefs (<i>four day field trip to Lady Elliot Island</i>)
NH-L15	Introduction to the ecology and identification of reef fishes (<i>reef fish taxonomy, functional and anatomical specialisation, feeding and territorial behaviour</i>)
NH-L16	Reef fish reproduction (<i>reproductive anatomy, physiology and behaviour of reef fish</i>)
NH-L17	Australian coral reef biota (<i>taxonomy, plants, invertebrate animals, vertebrate animals</i>)
NH-Ex14	Identification of reef fishes in the field – Part I & Part II
NH-L18	Biology of marine tetrapods (<i>evolution, biology, specialised adaptations of marine turtles, snakes, mammals and birds</i>)

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