BIOL3991 Directed Studies in Ecology & Biodiversity
Titles offered in 2026-27

Prof L Ashton
Research areas:
Insect ecology, plant-insect interactions, climate change.

Prof D M Baker
Research areas: marine conservation, restoration ecology, biodiversity and ecosystem functioning
Topic:

- Coral reef conservation in China: status and threats
- Blue Carbon and the Blue Economy
- costs and benefits of marine restoration

Prof T C Bonebrake
Research areas:
Tropical climate change impacts, tropical biodiversity and global change, endangered species conservation, and urban ecology..
Butterflies have served as our focal study taxa, but interests extend across a variety of species and systems.

Prof Si-Chong Chen
Research area:
Plant ecology; Animal-plant interactions; Biogeography; Fruits and seeds; Invasive plants; Biological conservation; Functional ecology

Topics:

- **Biotic Interactions: The Friends and Foes of Seeds**
  Uncover the secret life of seeds. Explore the dynamic ecological war between seeds, their helpful mutualists, and destructive predators to understand what really determines a plant's survival in the wild.
- **Biogeography: Mapping Plant Diversity & Functional Traits**
  Why do specific plants thrive in certain places? Investigate the large-scale spatial patterns of plant traits to understand how flora adapts to different climates and how they might respond to a changing global environment.
- **Seed Dispersal & Germination: The Journey of New Life**
  Investigate the crucial first steps of a plant's life cycle. Examine the mechanisms of how seeds travel, break dormancy, and successfully sprout under varying environmental pressures.
- **Harnessing AI for Biodiversity: Decoding Nature with Tech**

Apply cutting-edge artificial intelligence and machine learning to analyse complex ecological datasets. Bridge the gap between computer science and biology to tackle modern conservation challenges.

Prof J D Gaitan-Espitia

Research areas:

Evolutionary ecology (phenotypic plasticity, local adaptation, eco-evo dynamics)
Stress Ecology

Topic:

- Mechanisms of thermal acclimation, adaptation and evolution in ectotherms
- Blue carbon and seagrass ecology

Prof B Guenard

Topics:

- Evaluating the conservation value of insects: the case of ants
- The importance of ants in decomposition processes
- The ecological significance of social insects in vertebrate diet
- Cooler equal larger, does Bergmann's rule suit social insects? A test for individual and colony size
- Biological invasions of insect groups
- Global or regional patterns of biodiversity
- Ecological impacts of invasive ants on arthropods and wildlife
- Diversity of ants in urban environments, is it just low and exotic?
- Ant-plant interactions, which benefits for the plants?
- Foraging Ecology of ants
- Importance of social insects in the diet of vertebrates

Prof B C H Hau

Research areas:

Urban biodiversity studies

Prof Matthieu Leray

Research area:

Symbiosis; Coral Reef Resilience; Global Change; Functional Ecology; Trophic Ecology; eDNA; Marine Biogeography

Topics:

1. Nutrient provisioning and nutritional seascapes on coral reefs
2. The role of symbiosis in the resilience of coral reef ecosystems
3. Functional versatility and the persistence of coral reef communities

4. Use of molecular techniques to detect and manage rare, endangered and invasive species

Prof Guopeng Liang

Research area:

Soil Biogeochemistry; Ecosystem Carbon Cycling; Plant-Soil-Microbe Interactions; Nature-Based Solutions; Carbon Sequestration; Climate Mitigation; Soil Health; Food Security

Topics:

1. Assessing the impacts of environmental change and agricultural management on soil carbon cycling and plant productivity, while elucidating the underlying microbial mechanisms
2. Evaluating nature-based solutions to enhance soil health, ensure food security, and mitigate climate change

Prof J Merilä

Research areas:

Evolutionary biology, ecological and evolutionary genetics, biodiversity at genetic level, evolutionary ecology, wildlife trade

Topics:

- Evolution in response to climate change – recent evidence
- I have a broad range of interests, and I would be happy to discuss and entertain projects based on students' own ideas

Prof Bayden Russell

1. Are tropical species more susceptible to climate change?
2. Are marine heatwaves more important than average warming?
3. How does physiology relate to biogeography in marine organisms?

Prof C Schunter

Topics:

- Long non-coding RNAs and phenotypic plasticity
- The involvement of histone modifications in behavioural phenotypes
- Parental Effects
- Transgenerational effects
- Neurological effects of climate change in wild organisms

Prof Simon Y W Sin

Research areas:

Animal behaviour
Animal disease
Animal welfare/animal right
Genotype-phenotype association
Host-pathogen co-evolution

Prof ThiyagaRAJAN Vengatesen

Topics:

- Seafood safety and climate change
- Climate change impacts on oyster meat quality, taste and odor
- Big data and machine learning for oyster aquaculture

Prof Jin Wu

Research area:

Phenology; Global Carbon Cycles; Tropical Ecology; Restoration and Conservation; Nature-based Climate Mitigation; Ecosystem Health and Climate Extremes

Topics:

- AI for ecology
- Roles of land plant in global climate change
- Forest degradation and climate extreme responses
- Restoration and effectiveness assessments
- Climate change, fires, and post-fire recovery