BIOS 2008 ECOLOGY

Credit Points 10

Legacy Code 300839

Coordinator Uffe Nielsen (https://directory.westernsydney.edu.au/search/name/Uffe Nielsen/)

Description We live in a society where environmental problems dominate public debate. Ecology is one of the sciences required to find solutions to such problems; terms and ideas that came originally from ecology are used in public discussions, and in legislation. This subject will introduce students to ecology: what is studied, how it is studied, what are the strengths and limitations of ecology. Current ecological thinking will be covered, from the scale of individual organisms, through populations, and up to communities and ecosystems. Methods of study will be highlighted using evidence from molecular ecology through to field investigations.

School Science

Discipline Ecology and Evolution

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 2 subject

Equivalent Subjects LGYB 8458 - Ecology 21 BIOS 2007 - Ecology LGYB 8449 - Ecology 21 (V1)

Restrictions

Successful completion of 60 credit points

Assumed Knowledge

Knowledge of first-year university biology satisfactory completion of Biodiversity and Cell Biology or equivalent and the concepts of classification, evolution, taxonomy, cellular processes plant and animal structure and function.

Learning Outcomes

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

1. Define ecology as an area of study and place it in its scientific and social context
2. Explain how factors can be identified as limits to distribution
3. Describe the ecological concepts of populations, communities and ecosystems, and how tools such as modelling and molecular biology can be used to study them
4. Explain how ecology is used to solve real-world problems such as harvesting from wild populations or managing fire regimes
5. Describe indigenous approaches to the natural world and how these link to modern ecology
6. Conduct ecological investigations safely and ethically in the field and laboratory, using sampling methodology correctly to obtain valid ecological data
7. Use spreadsheets and statistical tools in analytical programs to enter, analyse and graph data and to draw appropriate conclusions from data
8. Communicate findings correctly in oral or in written form using an appropriate style, accessing the scientific literature to place the findings in context

Subject Content

1. Scope of ecology from individual organisms to communities and ecosystems
2. Origin of ecology as a science
3. Indigenous approaches to nature and links to modern ecology
4. Limitations of ecology in studying large, complex systems, with random inputs, and a low level of understanding of how they work
5. Limits to distribution of species - dispersal, habitat selection, abiotic and biotic factors
6. Investigations of limits of dispersal eg transplant experiments, physiological response studies
7. Population studies - definition, methodology, life tables as a tool, genetic and evolutionary approaches
8. Population growth - exponential and logistic growth, factors that cause fluctuations in population numbers eg density dependence, time lags, stochastic variation in vital parameters. Stochastic vs. Deterministic models of population growth
9. Biotic interactions in populations - competition, predation, herbivory, beneficial associations
10. Experimental tests of biotic interactions
11. Applied ecology - harvesting from wild populations, fire ecology, molecular ecology
12. Community ecology - definitions, models of how communities function and change eg succession, patch dynamics, equilibrium and non-equilibrium models
13. Ecosystem ecology - primary and secondary production, introduction to biogeochemical cycles.

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.

Type	Length	Percent	Threshold	Individual/ Group Task
Quiz	30 minutes each quiz	20	N	Individual
Report	2,000 words	25	N	Individual
Presentation	8 minutes, 10 slides max	10	N	Group
Final Exam	2 hours	35	N	Individual
Proposal	Max 1,000 words	10	N	Group

Prescribed Texts

- Krebs, C.J. (2009). Ecology: The Experimental Analysis of Distribution and Abundance. 6th Edition, Pearson International, San Francisco
- Begon, M & Townsend, CR (eds) 2021, Ecology From individuals to ecosystems, 5th ed, Wiley Blackwell, Oxford, UK

Teaching Periods

Spring (2022)

Hawkesbury

Day

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View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS2008_22-SPR_HW_D#subjects)

Spring (2023)

Hawkesbury

On-site

Subject Contact Uffe Nielsen (https://directory.westernsydney.edu.au/search/name/Uffe Nielsen/)

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=BIOS2008_23-SPR_HW_1#subjects)