BIOL 3100: ECOLOGY & EVOLUTION: AN AUSTRALIAN PERSPECTIVE

(3 Credit hours) (formerly BIOL 3813)
Pacific Study Abroad Program, Spring 2012

Instructor: Dr. David Garton, Georgia Institute of Technology

Textbook: Cotgreave and Forseth, *Introductory Ecology* (Blackwell Publishing).
In addition, class handouts and observation data sheets for field trips

Grading:		
	Two midterm exams:	25% each
	Field assignments:	20% (reports submitted for review and grading)
	Research paper:	20% (paper due April 20th)
	Participation:	10% (field notes in your journal)

Objectives: This course will cover basic principles of ecology and evolution, with a special emphasis on the unique ecosystems and biomes of Australia. The unusual animals and plants of the southern hemisphere had a significant influence on the early development and understanding of evolutionary theory, and their importance will be discussed. The successful adaptations of Australian mammals to this isolated continent will be explored, as well as the impact of recent human development.

The course includes field trips to areas of ecological interest, and students should be in reasonably good shape as some of the areas have steep trails and/or long walks.

Research paper: You will need to complete a five page (double-spaced, 12 pt. font) research paper on one of Australia's unique plants or animals, group of organisms or communities. You will need to choose this topic on your own, but no two students may share the same topic. Thus, topics are first come, first served, but only upon approval of the instructor. You should read several papers from the primary literature and summarize the basic methods, the most important data, and conclusions from those papers. You may also use internet resources for general information about your topic. Your papers should include a literature cited section and include citations in the text. Use standard citation format. The paper will be due April 20th and all papers should be submitted via email. **No late papers will be accepted**. To make sure that you do not wait until the very last minute to start this assignment you will be required to show me the papers that you plan to read from the primary literature on March 18th.

DATE		Topic
Feb	20	Introduction to ecology
	21	Biomes: Australia and beyond
	22	Population demographics, afternoon field trip to Waverly Cemetery – Demography exercise
	23	Natural selection, populations and distributions (intro)
Feb	27	Natural selection, populations and distributions (Lotka-Volterra)
	28	Natural selection, populations and distributions (meta-populations and risk of extinction)
	29	Australian forests, or is every tree a *Eucalyptus*?
Mar	1	Field trip to Long Reef (TBA, any day of this week, tide dependent) (physical & biological interactions controlling distributions of organisms over small scales)
Mar	5	Population ecology (biogeography & applications to conservation biology)
	6	Population ecology/review session
	7	Midterm Exam 1
	8	Field trip to Blue Mountains

Mar	9	Transfer from Sydney to Brisbane
Mar	12	Practical geology: The history of Australia and evolution of its flora and fauna
	13	Phylogeny of Australian animals: Why so many marsupials?
	14	Extended field trip to Heron Island Research Station, Great Barrier Reef
	15	Interspecific competition: Life and death amongst the corals (Heron Island)
Mar	19	Community ecology: food web structure & links on coral reefs (Heron Island)
	20	Species richness, abundance and diversity: how many species on a coral reef? (Heron Island)
	21	Travel day for return to Brisbane
	22	Community Ecology: Predation, parasitism and mutualism
Mar	26	Biogeochemical cycles: Mountains to the sea (and back again)
	27	Invasive species or Why we must spend so long going through customs
	28	Marsupial energetics, or are placentas more efficient for growing babies than pouches?
	29	Trophic transfer processes: where does all that energy go?
Apr	2	Student Presentations/Review Session
	3 or 4	Midterm Exam 2, Field journals due
	5	Group flight departs for USA
Apr	20	Research paper due!