Biology 2100: Island Biogeography of New Zealand
Pacific Study Abroad Program, Spring 2016
(3 credit hours)

Instructors:
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Dr. Robin Parker, Victoria University of Wellington

Class Time and Location: TBA

Course Description:
This course introduces students to the basic concepts of biogeography (factors determining the distribution of species) as applied in the special case of islands. The two oceanic islands comprising New Zealand provide relevant examples of the interaction of geology (plate tectonics, island formation, geological history, and the influence of land forms) and biology (size of islands, distance from mainland, adaptive radiation and island endemism). The first half of the Biology 2100 course focuses on the geological setting of New Zealand, which provides excellent examples of the interaction between plate tectonics and the geologic and geographic evolution of the North and South Islands, and the influence of landscapes, topography and geology on island climate and biota. The second half on the biological processes of colonization, adaptive radiation and extinction. The varied land forms of New Zealand provide an excellent laboratory for observing the island forming process, which is still active. National parks have preserved the natural plant and animal communities, found nowhere else on the planet, and which the students will have the opportunity to observe first-hand.

This course includes field trips to geological sites and natural preserves. All students should be able to negotiate difficult terrain, as well as be prepared to deal with inclement weather.

Resources:
- *The Song of the Dodo: Island Biogeography in an Age of Extinctions*, David Quammen
- Aitken, J.J. 1996. "Plate Tectonics For Curious Kiwis"
  - available from Victoria University bookshop
- "Tongariro Park Map (new edition)"
  - available from The Map Shop, 121 Thorndon Quay, Thorndon, near the Westpac Stadium
- Detailed hand-outs and field exercises provided in class.

Grading:

Exams:	50%
Quizzes:	15%
In-Class Activities & Participation:	10%
Field journal:	15%
Charged Magazine Article:	10%

Exams: Two 90-minute exams, each closed notes, will be administered at Victoria University. Each will cover half of the course material, as listed in the schedule below. Exams are non-cumulative.

Quizzes: Four 20-minute quizzes will be given in class on the dates listed in the schedule below.

In-Class Activities & Participation: Biological concepts are easier to learn and remember if you have the opportunity to apply them, practicing the skills you'll need to do well on quizzes and tests. In-class activities are team-based exercises to practice application of concepts from the course to relevant island examples. Many activities will have a graded portion to hand-in before you leave class. Attendance of class and field exercises is mandatory. Any unexcused absence incurs a 5% reduction in final course average.

Field Trips and Journal: We have three scheduled trips and one self-guided museum trip:

a) Self guided visit to Te Papa Museum, Wellington City (first week on your own)
b) Afternoon field trip to Wellington south coast (1/11)
c) 4-day field trip to Lake Taupo & Tongariro National Park (1/21-24)
d) Afternoon field trip to Zealandia Kaori Sanctuary (2/1)

Your field journal should include an entry from each of these trips and two additional freeform, NZ-based entries. These entries should showcase your observations, data analysis and interpretation in response to any provided question prompts, and reflections about the natural world in New Zealand. Suggestions for writing these entries include to compare and contrast with North American natural history or to relate an idea from lecture or course readings to New Zealand biogeography. Due dates: Please write each formal journal entry within 1 week of the trip. Journals will be spot-checked to provide feedback throughout the semester, and entries may be updated before the final due date. The final journal is due on 2/21, one week after the end of the NZ term.

Charged Magazine Article: New Zealand's unique geological history resulted in a remarkably endemic ecological community with a remarkably high level of endemism and no native large terrestrial mammals. Humans and human-associated animals have endangered or extirpated many endemic fauna. Each student will be assigned a specific animal species (or group) native to New Zealand and tasked to write an article for Charged Magazine (http://chargedmagazine.org/submit/), relating your species and its current status to real, live people back home in the States. Your work will be evaluated on the following criteria, modified from the Charged Magazine website:

1) Voice – You are encouraged to write in the first person, reflectively, about your subject. Try to avoid using scientific jargon or formal language. We welcome a variety of writing styles but boring is not one of them.
2) Creative content – Pieces cannot consist of reposted content with commentary. Each submission must include original words, created by you, and may also include other creative work: a sketch, photograph, video, audio recording, poem. Reminder: The GT Honor Code is strict on the subject of plagiarism. All text must be in your own words and ideas, and any quotes from sources must be referenced using standard formats. Extensive quotes are not in character for Charged Magazine, which seeks contributions in the authors own words and ideas.
3) Subject matter –Your submission should include the following factual content at minimum, all supported from the scientific literature and appropriately cited:
   - scientific name(s) of your organism(s) and taxonomic group, including closest living relatives, if any, and where found
   - vicariance or dispersal evidence and timing for origin or arrival in NZ
   - ecological niche and basic life history
   - the endangered or extinct status, why or how and what steps are being taken to prevent extinction (if it is still found in NZ)
   - a creative connection between the species and your readers

The final article is due on 2/21 as a pdf file to t2/assignments/Charged Magazine Article, one week after the end of the NZ term. Draft due in class on 2/9.

Lectures: Monday-Thursday, times TBA, schedule subject to revision.

Date	Who	Lecture Topics	Activities/Field Trips
Part 1: Geological Setting			
6-Jan	RP	Earth structure and Silicate minerals	
7-Jan	RP	Major rock types; rock cycle; magmas and volcanoes	
8-Jan	RP	Folds, faults, and Dating of geological events	Quiz 1 (10 minutes)
11-Jan	RP	Earthquakes and Global plate tectonics I	Taputernaga Marine Reserve (12–6 pm)
12-Jan	RP	Global plate tectonics II and Intro to NZ Geology	
13-Jan	RP	New Zealand plate tectonics	Local field trip to exposed marine sediments near Wellington
14-Jan	RP	Formation of atolls & island chains	Quiz 2 (10 minutes)
18-Jan	RP	Taupo Volcanic Zone	
19-Jan	RP	Review Session	
20-Jan	RP	**Exam 1: Covers lectures 1-8**	Exam is 1.5 hours, closed book
21-Jan	-	Weekend Field Trip: Lake Taupo & Tongariro National Park	**Depart Thursday 1/21 7:45 am** **Return Sunday 1/24 5:30 pm**
Part 2: Biological Processes			
25-Jan	CS	Introduction to Biogeography	Activity - Hawaiian Archipelago
26-Jan	CS	Island Biogoegraphy Theory	
27-Jan	CS	Evolution by Natural Selection	Activity - Galapagos Finches
28-Jan	CS	Human Impacts - Invasive Species	Quiz 3 (10 minutes); Activity - New Zealand Rabbits
1-Feb	CS	Field Trip: Zealandia Kaori Sanctuary	Local field trip to the Zealandia Kaori Sanctuary (1:45-5:00 PM)
2-Feb	CS	Intro to Population Ecology	Activity - TBA
3-Feb	CS	Endemic New Zealand species	Activity – Charged Brainstorming session
4-Feb	CS	Historical Biogeography of NZ	Quiz 4 (10 minutes)
8-Feb	CS	Biodiversity 1	Activity - TBA
9-Feb	CS	Biodiversity 2	Activity – TBA; **Bring a draft Charged Magazine Article paper copy to class**
10-Feb	CS	Conservation Biology	Activity - Corridors
11-Feb	CS	Review Session	
12 or 13-Feb		**Exam 2: Covers lectures 10-20**	Exam is 1.5 hours, closed book
21-Feb	CS	**Field Journal** and **Charged Magazine Article due**	