

Biology

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3 credit hours, 2) UD only (Upper Division) 300-400)

Can the course be taken to fulfill major and minor requirements? **YES**

Can the course be taken to fulfill general elective credit? **NO**

Local Course Designator at University of Kentucky: **BIO 355: Biology Study Abroad (Subtitle: Australian Ecosystems)**

Description: Australian Ecosystems Swim with turtles at the Great Barrier Reef, observe kangaroos in the wild, participate in a conservation project to preserve koala habitat, hike in the tropical rainforests of Queensland. This course will focus on the biodiversity of selected Australian terrestrial ecosystems (tropical rainforests, eucalyptus forests, mangroves) and the marine ecosystem of the Great Barrier Reef, and will include an examination of the ecological consequences of human activities on these ecosystems.

Content: Learning Objectives By the end of the course, the students should be able to: Identify and name common Australian plants, animals and ecosystems. Identify biotic and abiotic components of selected Australian ecosystems. Describe the ecological interactions that occur between organisms. Discuss the relationship between adaptations exhibited by Australian biota and climatic conditions. Gather, analyze and process information from field activities. Gather, process and analyze information from secondary sources. Write a research paper. In this course, students will have the opportunity to study selected Australian ecosystems. Australia possesses a very varied and unique biota. In the span of a short 14 day trip it is not possible to study all ecosystems and so on this trip the focus will be primarily on tropical rainforests, eucalyptus forests, mangroves, and barrier reefs. Prior to leaving for Australia, students will work through some course material and complete some assignments that review the basic concepts of ecology (ecosystems, food webs, energy flow, chemical flow, change in ecosystems, adaptations). This study will set the scene for the trip itself. During the trip students will gain an appreciation of the unique biodiversity of Australian terrestrial ecosystems, will conduct some field work and on their return will write a research paper on the evolutionary adaptations exhibited by Australian biota. A copy of the course syllabus from Dec 2013/ Jan 2014 is attached. Texts Required: Australian Wildlife: An Introduction to Familiar Species by Waterford Press. Available through Waterford Press (www.waterfordpress.com) or Amazon (www.amazon.com) ISBN: 1-58355-035-6, price \$5.95. Required: The Future Eaters:

An Ecological History of the Australasian Lands and People by Tim Flannery, Grove Press (1994). You can purchase a used copy of this book through Amazon (www.amazon.com) ISBN: 0-8021-3943-4, price \$6 - \$10 + shipping and handling. An appropriate field guide will be purchased in Cairns (bring \$20.00 to cover this cost) Required: The Australian Ecosystems Course Package provided by Instructor

Prerequisites: One semester of biology

Assessment Methods: Grading: Final grades will be based on your performance on the following course requirements:

	Pre-departure Assignment	10
points (5 %)	Reflective Journal	40 points (20%)
Written Reports (2 total)	30 points (15%)	Post-trip research
paper	100 points (50%)	Attendance
points (5%)	Species List	10 points (5%)

TOTAL 200 points Final grades will be based on the total points earned out of the possible 200 points. A = 180 – 200 points B = 160 - 179 points C = 140 – 159 points D = 120 – 139 points E = less than 120 points NOTE* failure to turn in

the post-trip research paper will result in a failing grade for the course. 1. Pre-departure Assignment (10 points) This assignment focuses on some of the basic concepts of ecology: ecosystems, food webs, energy transfer in ecosystems, balance and change in ecosystems and will consist of 20 multiple choice questions (0.5 points per question). The review material and the assignment can be found in the course package (supplied with syllabus). This material should be reviewed for the students; I want to be sure that everyone is familiar with basic ecosystem interactions before we leave on the trip. Submission of Homework Assignment The assignment must be submitted by e-mail to rebeat1@uky.edu on or before 9am on 22nd December 2014). 2. Reflective Journal (40 points) Each student will keep a reflective journal for the duration of the trip. The purpose of keeping a reflective journal is not just to document "What I did on my trip", but is an opportunity for students to reflect on their thoughts and feelings about what they are experiencing. Students must write at least 300 words in the reflective journal each day. These journals can be hand written but must be legible. The journals will be taken in for review on the 4th January (as you board the plane from Cairns to Sydney/Melbourne – they will be returned at the end of that day) and must be submitted to the Instructor, for a score, by 16th January 2015. To help focus student thoughts I provide a number of prompts to get them started … these must be responded to in the journals. As they begin the trip: Why did you choose this particular course and what are you hoping to gain from the experience? What fears, worries, concerns and questions do you have about the trip? What do you expect to encounter? What do you think life in Australia will be like? How do you expect it to differ from the U.S.A. During the trip (each day): What did you do that was fun and satisfying today? Explain Was there anything frustrating about today? What was the best thing that happened to you? Why was it the best? How is what you have seen today related to your reading of The Future Eaters? Do your observations confirm or contradict the author's observations and conclusions? At the end of the trip: What will you do with the

knowledge that you learned on this trip? Were your expectations met on this trip? Explain. What was the best thing that happened on the trip? Why was it the best? Did you encounter something you didn't expect? Were there any surprises? What will you bring home from the trip (not your list of souvenirs)? Grading scheme: 25% of the points for the 4th January review

75% of the points for the final review Points will be taken off for each missing day in the journal (5 points per missing day) and for descriptions that are statements of fact (what I did today) rather than descriptions reflecting thought. Note* Because of the time zone changes: The 26th & 28th will count as two days not three 3. Written and Oral Reports (2 oral and written reports, 15 points each)

1. Future Eaters Report: Each student is required to read The Future Eaters prior to departure. Each student will be assigned one chapter on which they will write a 2 & 3 page summary (prior to departure). Chapters will be assigned by the course Instructor. Each student will give an oral report of his or her summary to the class. The oral report will be worth 5 points and the written summary 10 points. A copy of the word-processed summary is to be submitted to the Instructor on arrival in Cairns on December 28th, 2014. 2. Mangrove Ecosystem Report: While in Cape tribulation, we will be studying the mangrove ecosystem. Each student will write a 3 & 5 page report on mangroves. This report should include the following: a. A description of what is a mangrove b. Gas exchange adaptations found in mangrove trees c. Seed dispersal adaptations (describe at least 3) d. Salt and soaking adaptations (describe at least 3) e. Support in soggy soils (describe at least 3) f. Aquatic fauna g. Epiphytes (describe at least 3) This hand-written report will be due on January 8th at the beginning of the class meeting. The report is worth 15 points. 4. Post-trip Research Paper (100 points)

On returning home, students will prepare a research paper discussing the adaptations exhibited by Australian biota. Information from both their field observations (from all fieldtrips) and from secondary sources should be used in preparing this paper. Basic format: This final paper must be a minimum of 20 pages and no more than 25 pages long. This page count does not include the works cited page or the title page. This paper must be word processed. Hand-written papers will not be graded. Font should be 12pt Times Roman or Arial, double spaced. Margins should be 1" top and bottom and 1" on the left and right. Justify the margins. Reference and quote material using the ACS style. Go to <http://pubs.acs.org/books/references.shtml> for information on the ACS style. No more than 1/5 of the paper can consist of drawings, photos, graphs or charts. The submitted papers should be spiral bound. While working on your paper constantly backup your work and keep a current copy of the paper on a separate disk. Keep a complete finished copy of the paper for yourself. Do not procrastinate with this paper. This is a major paper worth half of your grade. TWO COPIES of the final paper must be mailed to the instructor to arrive NO LATER THAN THE 17th FEBRUARY 2015.

Specifics on the Paper Content: Australian flora and fauna exhibit an incredible array of evolutionary adaptations. Some of these adaptations are due to geological changes that have occurred over time, others are in response to variations in temperature and the availability of water, and yet others are in response to human activities. During the course of the trip you will gather and process information that focuses on adaptations related to Australian biodiversity. After the trip you

should process that information and write a paper discuss evolutionary adaptations found in Australian flora and fauna. In this paper you should include the following: Describe the key events in the formation of Australia as an island. Discuss the mechanism of natural selection in the evolution of a species. Give examples (drawings, photographs) of variation in two species that you observed on the trip. Describe (mean annual rainfall, mean annual temperature, type of plant and animal life etc) at least three different ecosystems that you studied on the trip. Include images (drawings or photographs) of at least 4 plants and 4 animals that are typically found in those areas. Discuss the effect temperature and rainfall has on the flora of an area. Identify particular adaptations found in plants and animals that allow them to survive in each of the ecosystems described above. Illustrate with examples (include photographs or drawings) from your observations. Describe the impact of human activity on the tropical rainforest and the sclerophyll forest ecosystems of eastern Australia. Illustrate with examples (photographs or drawings) from your observations. Describe how your observations support or contradict the discussion of Tim Flannery in *The Future Eaters* (as it relates to his discussions on Australia) —; This section of your paper should be NO LESS than three of the 20-25 pages. 5. Attendance (10 points) You are expected to attend all course activities. Five points will be automatically deducted from your attendance points for each and every unexcused absence from a course activity, field trip or class meeting. Problems associated with traffic, over-sleeping, procrastination or forgetfulness are not acceptable excuses for missing a class activity. It is the student's responsibility to make sure that they arrive on time for every class activity. 6. Species List (10 points) Each student will keep a log of the different plants, and animals (including birds and fish) spotted on the trip. For each entry, the scientific name and the common name should be listed along with the location and date. If possible a drawing of each organism should be included. The Instructor will review this list on January 8th during the class meeting.

Physical Requirements: Students should be able to walk at least 3-5 miles a day, be able to carry their own bags at least ¼ mile, be agile enough to climb in/out of small boats and to scramble over rocky terrain.