



**OTS – UHH Tropical Island Ecology and Evolution  
UHH BIOL 481 & 481L**

**Course Description:** This course introduces students to the fundamental principles of ecology and evolution through a tropical island framework. Students will work with UHH faculty and local experts to design and carry out individual research studies in a variety of natural areas on Hawai'i Island. Through lectures and fieldtrips to ecosystems such as coastal strand, lowland river valleys, active volcanoes, tropical rain forest, and tropical dry forest students will learn about the processes of competition, dispersal, primary succession, restoration, speciation and extinction, and the various factors that threaten island biodiversity.

**Course Prerequisites:** Students must be at least 18 years or older at the start of the course and have completed one full-year of biology courses at the undergraduate level

**Course Learning Objectives:** By the end of the course, students will be able to:

- 1) Identify and understand the key processes that influence the ecology and evolution of tropical island ecosystems
- 2) Discuss conceptual issues underlying current research topics in tropical island environments, with an emphasis on the methods and tools used to conduct ecological and evolutionary research
- 3) Evaluate and discuss scientific research critically
- 4) Successfully design and carry out all aspects of a field research project, including presentation of results in both written and oral formats
- 5) Apply the knowledge of island ecosystems gained from this course to address conservation issues in a variety of tropical landscapes across the globe

**Course Grading:** Grades are based on written assignments, field projects, presentations of results in written and oral formats, and participation.

**BIOL 481:** This course will focus on reading and discussion of primary literature with an emphasis on current research topics in tropical island environments. The selected literature will relate closely to conservation biology, island biology, and Hawai'i in particular. At each field site, students will be introduced to key ecological processes influencing the particular ecosystem through: 1) field orientations lead by local experts identifying important plant and animal species and their natural history, 2) research presentations, and 3) reading of scientific literature. Students will be expected to reflect, interpret, and discuss topics related to each ecosystem. These activities also serve to stimulate research questions that students can address in independent research projects.

<b>BIOL 481</b>	<b>% Final Grade</b>
Response Papers	30
Literature Discussions	20
Literature Review	40
Group Participation	10

**Response Papers:** Students will write two response papers. Response papers are short papers that involve both summary and critique of scientific papers focused on the different ecosystem visited during the course.

## Tropical Island Ecology and Evolution Syllabus

**Literature Discussions:** Attendance and participation in discussions are very important for the success of this class. You will be required to prepare two thoughtful “discussion questions” for each assigned article. These questions, which should address the theoretical or experimental aspects of the paper, will serve as the basis for class discussions.

**Literature Review:** Students will be given a topic at the beginning of the course related to a conservation issue in Hawai'i that will be used as a foundation for a literature review. The literature review will focus on summarizing and synthesizing the current state of knowledge on the assigned topic, allowing students to gain a more in-depth understanding of conservation issues facing tropical island ecosystems. The literature review should not only be a compilation of recent research finds on the assigned topic, but also serve to critique what is known about the topic and highlight deficiencies in the knowledge, helping to identify new areas of research. Sections of the literature review will be due throughout the course, allowing for written feedback from both faculty and students before the final review is due.

**Group Participation:** Students are expected to attend and actively participate in each activity, and work cordially with all group members.

**BIOL 481L:** This course will focus on designing and conducting research projects in the areas of ecology and evolution using Hawai'i as a natural laboratory. Students will work with faculty and invited researchers to conduct mini-field projects at different field sites, providing students with hands-on experience in conducting ecological and evolutionary research projects from start to finish. At the end of the course, students will work in small groups to design and execute an independent research project with guidance from course faculty and invited researchers building on what students learned during their previous mini-projects.

<u>BIOL 481L</u>	<u>% Final Grade</u>
Fieldwork and Data Analysis	30
Scientific Writing	50
Final Presentation	15
Group Participation	5

**Fieldwork and Data Analysis:** Students will conduct mini-research projects guided by course faculty and invited researchers at different field sites throughout the course. Participation in fieldwork, as well as discussion and analysis of the research projects, provides students with an opportunity for hands-on experience in ecological research.

**Scientific Writing:** Students will work in groups to write brief scientific reports for two mini-research project. For the first mini-project, students will divide the responsibilities of the report among group members. For the second mini-project, students will individually write a report, and then as a group work together to put together a “super paper” based on combining the individual papers into one. This process will allow students to see different writing styles and approaches to addressing the same topic. Write-ups for the mini-projects will be evaluated by faculty to provide students with an opportunity to learn the scientific writing process and data analysis prior to working on their final research project. For the final research project, students will work in small groups to develop a research question, collect data, and analyze their findings, but the formal scientific report for the project will be written individually. All reports will follow a scientific journal format (e.g., Conservation Biology), consisting of a Title, Abstract, Introduction, Methods, Results,

## **Tropical Island Ecology and Evolution Syllabus**

Discussion, and Literature Cited. Scientific literature must be incorporated in both the introduction and discussion sections of your reports.

**Final Presentation:** As a group, students will give an oral presentation of their final research project at the University of Hawai'i Hilo campus using a PowerPoint presentation with a scientific meeting style format. Presentations will be given to peers, visiting researchers, and the university community at large, allowing students to develop skills in communicating science to broad audiences.

**Group participation:** Students are expected to attend and actively participate in each activity, and work cordially with all group members.

**Course Instructors:**

Course Coordinator: Dr. Kristina Paxton

Course Instructor: To be announced

Resource Faculty: Dr. Patrick Hart, Dr. Becky Ostertag

Visiting Researchers: To be announced

**Textbook:** Scientific literature relevant to ecological processes discussed in class and research projects will be made available to students.