

Botany 130 lecture/lab
Plants in the Hawaiian Environment CRN 63098

4 units Hale 'Imiloa 101
TR 8:30 – 11:00 am

INSTRUCTOR: Teena Michael PhD
OFFICE: Hale 'Imiloa 107
OFFICE HOURS: T & R 12:00 to 1:00 and other times by appointment
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EFFECTIVE DATE: Fall 2016

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawaii and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide O'ahu's Ko'olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

Introduction to the evolution of plant communities and species of Hawaiian ecosystems; ecological interactions; observations, identification and systematics of native and introduced flora. Lecture/laboratory/field trip course. (3 hours lecture, 3 hours laboratory).

Activities Required at Scheduled Times Other than Class Times

- Saturday morning field trips (each field trip replaces one regular lab/class)
- Preparation for class! Read assigned chapters or hand outs before class
- Form groups and develop projects based on your interests.

REQUIREMENT COURSE SATISFIES:

AT WCC: (<http://windward.hawaii.edu/Courses/BOT130/>)

- [Associate in Arts - Biological Sciences \(DB\)](#)
- [Associate in Arts - Natural Sciences Lab \(DY\)](#)
- CA Agripharmatech: Ethnopharmacognosy (Elective)
(http://windward.hawaii.edu/Academics/Agripharmatech_CA/)

STUDENT LEARNING OUTCOMES

The student learning outcomes for the course are:

- 1) Discuss geological history of the Islands and natural history of plants in Hawaii.
- 2) Discuss the arrival, establishment, major evolutionary trends and adaptive radiation of some of the surviving native species.
- 3) Discuss natural and human-mediated changes in the ecosystems, plant succession, and interaction between native and introduced species of plants.
- 4) Discuss botanical terminology for use in identifying native plants.

COURSE CONTENT

Concepts or Topics

- Discuss groups of plants associated with coastal and dry to wet forest habitats in Hawaii; learn about various locations throughout the islands where relicts of these plant communities are still preserved
- Learn about basic plant anatomy including functions of structures and their adaptive ecological evolution
- Evolution in ecosystems: involving the role of volcanism, dispersal, plant-animal interactions and variations of rainfall (climate)
- Discuss techniques used to investigate prehistoric plant communities and the role of humans and the organisms they introduced in altering the landscape (in both the past and present-day)

Skills or Competencies

1. Given background knowledge of a plant specimen's origin, growth habit and other defining characteristics, *be able to identify its scientific and Hawaiian names.*
2. Use basic taxonomic characters to *differentiate between related species & genera.*
3. Be able to identify locations in the Hawaiian Islands where various native plant communities are still relatively intact.
4. Understand the role of the Pacific trade winds in shaping the distribution of plant communities in Hawaii.

COURSE TASKS

Our class will incorporate presentations, discussion, videos, field trips, guest speaker(s), projects and presentations with service learning as an option.

Field Trips

Our field trips will be on specified class days and some Saturdays throughout the semester and are designed to enhance your learning of plants that are found in distinct Hawaiian environments. Field trip exercises will be developed for each excursion that will give focus to the specific environments and the plants as well as their ecological and evolutionary interactions/roles. I highly recommend you bring a cell phone or camera to capture images and video. Guidelines for field trip write ups include video options and will be discussed in class.

Attendance and participation during class and field trips is essential for learning Native plants.

Transportation to field trips is the responsibility of the student.

Projects

Student projects are part of our course and will be discussed in class. I encourage you to come to class with ideas on what you want to master and we will discuss projects right away. I encourage you to create photographs and/or movies that you can use in the presentation of your projects.

PROJECT 1

Choose *one* native Hawaiian plant (endemic or indigenous) Hawaiian Plant *ecosystem* and describe the living and non-living components of your ecosystem. What are the basic geology and environmental characteristics of the ecosystem?

Lobeloid, Silversword, Ohia species or other native plant (endemic or indigenous) Hawaiian Plant

- What are the family characteristics of the species you choose?
- What characterizes the plant in terms of its vegetative and reproductive characters?
- Who or what pollinates you plant?

- How have (and/or do) Hawaiian people use the plant?

PROJECT 2 *final project*

- Choose *one ecosystem* and describe the living and non-living components of your ecosystem. What are the basic geology and environmental characteristics of the ecosystem?
- Include at least 3 native plants and tell their stories. YOUR story will influence what you emphasize!

ASSESSMENT TASKS AND GRADING

Class presentations, movies, group exercises, field trips and worksheets will be resources for you to succeed on the exams.

Worksheets in the style of the exams will be added along with presentations to Laulima (Resources).

Add your work to Drop Box of Laulima.

Make-up for exams is permitted for emergencies or illness accompanied with a doctor's note; and must be completed within one week of the scheduled exam date. *There are no make-ups for the Final Exam!*

Grades

Exam 1	100 points
Exam 2	100
Final Exam	125
Field trips	100
Project 1 Native species & ecosystem	25
Project 2 Final Project	25
Exercises & Movie Reflections	100
<u>Herbarium 10 Species</u>	<u>50</u>
	625 points

Service Learning

I encourage you to *volunteer* at a Hawaiian/Restoration site as part of Service Learning. Full participation (20 hours/semester) will result in an A grade for one exam (but you must take the exam and earn a C or better) as well as an opportunity to apply theory to practice and contribute to the perpetuation of the sites and all associated with it.

<http://servicelearning.socialsciences.hawaii.edu/pages/mina.html>

Grading

Grading is based on the percentage of total points earned. Final Grades will be assigned as follows:

- A 90 - 100%
- B 80 - 89%
- C 70 - 79%
- D 60 - 69%
- F 0 - 59%

I (incomplete), given at the INSTRUCTOR'S DISCRETION when you are unable to complete a small part of the course because of circumstances beyond your control. It is YOUR responsibility to make up incomplete work with a minimum level (or better) of achievement. Failure to satisfactorily make up incomplete work within the appropriate time period will result in a grade change from "I" to the contingency grade identified by the instructor (see catalog).

CR (credit), 60% or above in total points. See catalog for specifics and calendar for dates. NC (no credit) will be assigned for a grade below 60% of total points. The NC grade will not be used as an alternative grade for an "F". Last day to withdraw with "W" grade is October 30, 2015.

LEARNING RESOURCES

Carlquist, S.J. 1970 - 1980 editions. Hawaii: A Natural History. Pacific Tropical Botanical Garden.

Additional Texts/Resources

Lincoln, N. K. 2009. Amy Greenwell Garden Ethnobotanical Guide To Native Hawaiian Plants.

Sohmer, S.H. & R. Gustafson. 1987 or 1996. Plants and Flowers of Hawaii. Plants and Flowers of Hawaii. University of Hawaii Press.

Gustafson, R., Herbst, D. & P. Rundel. 2014. Hawaiian Plant Life: Vegetation and Flora. Hawaii. University of Hawaii Press.

Mueller-Dombois, D., Jacobi, J., Boehmer H. & J. Price. Ohi'a Lehua Rainforest; Born Among Hawaiian Volcanoes, Evolved in Isolation. 2012. Hawaii. University of Hawaii Press.

Websites (not a comprehensive list!)

<http://www.botany.hawaii.edu/faculty/carr/natives.htm>

<http://www.Hawaiiannativeplants.com/>

<http://nativeplants.hawaii.edu/>

<http://www.honolulumagazine.com/Honolulu-Magazine/February-2012/The-First-Hawaiians-Native-Plants/>

<http://wildlifeofhawaii.com/flowers/>

- SEE PARTICULARLY NATIVE PLANTS AND FAMILIES

- <http://wildlifeofhawaii.com/flowers/category/native-status/native-plants/>

- <http://wildlifeofhawaii.com/flowers/category/plant-family/>

<http://www.to-hawaii.com/oahu/gardens/hoomaluhiaobotanicalgardens.php>

<http://www1.honolulu.gov/parks/hbg/kcbg.htm>

<http://www1.honolulu.gov/parks/hbg/>

<http://www.marinelifephotography.com/flowers/flowers.htm>

<http://www.bishopmuseum.org/podcasts/>

Additional Information

Disabilities Accommodation Statement

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached at 235-7448, lemke@hawaii.edu, or you may stop by Hale 'Akoakoa 213 for more information.

Nondiscrimination and Affirmative Action

The University of Hawaii is committed to a policy of non-discrimination on the basis of race, sex, age, religion, color, national origin, ancestry, disability, marital status, arrest and court record, sexual orientation, or veteran status in all of its programs, policies, procedures, or practices.

This policy covers admission and access to, participation, treatment and employment in University program and activities.

Fall 2016 Botany 130 Lecture/Lab SCHEDULE

Date	Lecture Topic	Textbook Chapter(s)
Aug 23	Introduction to Plants & Environments & Class!	
	http://hawaii.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.hawaii/plate-tectonics-the-hawai699ian-archipelago/ Plant Identification What are characters that we use to identify plants?	
25	Plants & Environments Evolution & Plants <i>What is the Hawaiian environment?</i> Plant Organs—Characters for identification Collect & Classify	1 pp. 1-63
30	<i>What is the Hawaiian environment?</i> Geology of the Hawaiian Islands http://hawaii.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.dateflows/dating-lava-flows-on-mauna-loa-volcano-hawai699i/	1 pp. 1-63
Sept 1 & 6	<i>What is the Hawaiian environment?</i> Geology of the Hawaiian Islands Movies: Rivers of Fire, Hawaiian Volcanos	
	<i>What is the Hawaiian environment?</i> Climate of the Hawaiian Islands http://hawaii.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.newland/how-did-life-emerge-here/ Plant Identification & Evolution	2 pp. 63-80
8	<i>What is the Hawaiian environment?</i> Climate of the Hawaiian Islands http://hawaii.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.newland/how-did-life-emerge-here/ Movie: How the Earth Was Made	
13	Field Trip Hui Ku Maoli Ola Kaneohe Native Plant Nursery	
15 & 20	<i>What are Hawaiian biological phenomena?</i> Dispersal to Island Environment Spore Plants to Seed Plants Loss of Dispensability & Competitiveness in Hawaiian Plants Plant Identification SPORE PLANTS Movie: Fern Life Cycle	3 – 4 pp. 81-122
22	<i>What are Hawaiian biological phenomena?</i> Problems with Island Existence http://hawaii.pbslearningmedia.org/resource/fdeb580d-5b77-4f73-bff1-3f9a8494044d/life-on-fire-fauna-and-volcanoes/ <i>What are Hawaiian biological phenomena?</i> Adaptations to Island Environment	3 – 4 pp. 81-121
27	EXAM 1	
29	<i>What are Hawaiian biological phenomena?</i> (Adaptations to Island Environment & Arborescence, Loss of Dispensability & Competitiveness in Hawaiian Plants) Movie: Islands Within Islands Within Islands. Plant Identification	5 – 6 pp. 122-156 163-179
Oct 4	Native Plant/Ecosystem Presentations Day 1	
6	Native Plant/Ecosystem Presentations Day 2	14-19
11	NĀ PŌHAKU O HAUWAHINE http://www.ahahui.net/PROGRAMS/NaPohaku.html	
13	Introduction to Ecosystems, Communities & Geographic Zones Plant Identification	
15	Native Plant/Ecosystem Presentations Day 3	14-19
15	Saturday Option: Ho'oulu 'Aina, Kalih Valley Nature Preserve u/Kokua Kalih Valley OR NĀ PŌHAKU O HAUWAHINE	

18	Coastal Strand & Dry Forest Movie: Living Jewels	pp. 267-300
20	Dry Forest & Shrubland *Lowland Ecosystems Movies: Saving Kahuku & Water of Life Plant Identification	15 pp. 275-300
25	Mesic & Wet Coastal Forest, Mixed Mesic & Montane Movie: The Rain Follows the Forest	16 – 17 pp. 300-345
27	Alpine & Bogs Movies: Mauna Kea: Temple Under Siege & First Light Mauna Kea	18 – 19 pp. 345-374
Nov 1	EXAM 2	
3	Pu'u Ma'eli'eli Kaneohe Pill Box	
8	GENERAL ELECTION DAY	
10	Conservation in Hawaii Plant Identification & Herbarium	
15	Alteration of Native Hawaiian Vegetation Movies: People of the land & Miconia threatens Maui Identify Invasives!	Handouts
17	Class Cancelled for Saturday Field Trip!	
19	Saturday Double Field trip Koko Crater Botanical Garden (Sandy Beach) option	
22	Ohia Forest Cohorts, Regeneration & Activism	
24	HOLIDAY	
29	OPEN	
Dec 1	Northwest Hawaiian Islands and Marine Ecosystems Group Projects begin!	
6	Group Projects	
8	Group Projects & Pa'ina —Prep for Final	
15	FINAL EXAM 8:30-10:30	

Note: The order of the topics will remain although the schedule may be modified as we proceed. I will announce any changes ahead of time. Field trip destinations may be modified as we proceed!

Have a great semester!

***For addition Service Learning Options (Saturday Options) we are welcome to be part of University of Hawai'i at Mānoa College of Social Sciences's Program for Civic Engagement. See the schedule for each month:*

<http://servicelearning.socialsciences.hawaii.edu/ahupuaacal.html>