



Botany 130 Lab
Plants in the Hawaiian Environment CRN 61384
1 unit Hale 'Imiloa 101
F 8:30 – 11:15 am

INSTRUCTOR: Teena Michael PhD
Office: Palanakila 142
Office Hours: To Be Announced for in person and zoom options
Contact: Email: teena@hawaii.edu Phone 808 236-9114

Zoom Topic: B130Lab
Time: This is a recurring meeting Meet anytime

Join Zoom Meeting
<https://hawaii.zoom.us/j/99637893636>

Meeting ID: 996 3789 3636
Passcode: nanu

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

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

COURSE DESCRIPTION

BOT 130L focuses on observations of Native Hawaiian plant species, populations and communities as they interact in the natural environment and studies the unique characteristics of the plants through lab and field observations (3 hours laboratory). This 1-credit course accompanies the 3-unit lecture course. Pre-Requisite: Credit or concurrent enrollment in Bot 130.

REQUIREMENT COURSE SATISFIES:

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

STUDENT LEARNING OUTCOMES

- Master botanical terminology for use in identifying Native Hawaiian plants.

Visualize patterns and illustrate botanical terminology for use in identifying Native Hawaiian plants and identify species by understanding their vegetative (roots, stems and leaves) and generative (flowers fruits and seeds) patterns.

- Analyze the environmental factors that affect the plant dispersal and establishment, adaptation and diversification that could be selective pressures in evolutionary time frames.

Identify native and invasive plants on Oahu.

COURSE TASKS

Our class will include laboratory and field-based studies using scientific inquiry and the based on the scientific method. Lab worksheets will be provided to the students for completion during the lab and resources will be provided as handouts.

FIELD TRIPS

Our field trips will be on lab class days throughout the semester and are designed to enhance learning of plants that are found in distinct Hawaiian environments. Field trip reports (written, slide show or movie) must be turned in for each field trip in order to get full credit. Guidelines for field trip write-ups include video options and will be further discussed in class.

I highly recommend you bring a cell phone or camera to capture images and video when we are in the field together.

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

Transportation to field trips is the responsibility of the student.

DO bring a notebook for notes each class and organize yourselves so that each project develops EACH class! Your notes and thoughts throughout our lab class will be essential to gaining information/thoughts/applications and seeing/finding *connections*...

PROJECTS

Each student will develop and carry out a lab and/or field based study to be discussed and developed in class. This project can be individual or group and will follow the structure of scientific inquiry/method. These will be termed **RESEARCH PROJECTS**.

Additional **LAB PROJECTS** will be conducted in class to augments learning of the relationships of *plant form and function* as relevant to Hawaiian plants.

We will collectively and individually look into—the unseen world...how do we do this? Why would we do this? Photography and the Unseen World will be considered in **PLANT STUDIES!**

Starting our second lab we will begin **GARDEN PROJECTS** in which each student will be given a plant for growing at home AND a plant and/or area of one of our gardens on WCC campus near Imiloa, to care for. For you plant at home, you will observe, water and watch your plant as it grows and flowers. Suggestions and a website will be provided for you as you learn how best to maintain your native Hawaiian flowering plant. When we are able to be together at WCC, your garden work will extend to clearing weeds, caring for your native plant(s) and planting as well. Details will be given for all projects in class.

Service learning? Lets discuss this in person!

ASSESSMENT TASKS AND GRADING

Grades

Exercises, Quizzes, Reflections	100 points
Field Trips (5) 20 points each	100
Research Project	50
Lab Projects	50
Garden Project	50
Plant Study	50
Herbarium 10 Species	50
Final Exam	50

500 Points

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%

An I (incomplete) grade is 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 a "W" grade is October 30, 2023.

LEARNING RESOURCES (not required)

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

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.

Mueller-Dombois, K.W., Bridges & H. L. Carson. Island Ecosystems; Biological Organization in Selected Hawaiian Communities. 1981. Hutchinson Ross Publishing Company.

Websites (not a comprehensive list!)

You will need the scientific name of the flowering plants and spore plants (e.g. ferns) to find your plant and this site has most or all of the Hawaiian names as well as thumbnail images you can click on to enlarge—wonderful images!

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

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

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

<http://data.bishopmuseum.org/ethnobotanydb/ethnobotany.php?b=list&o=1>

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

https://www.lokoeca.org/uploads/1/1/3/4/113439871/olelo_noeau.pdf

‘Ōlelo No ‘eau; Hawaiian Proverbs & Poetical Sayings—for example number 1471 might be

useful to start thinking about how the moon relates to planting in Hawaiian knowledge.

DISABILITIES ACCOMMODATIONS

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 'Ākoakoa 213 for more information.

TITLE IX

Title IX prohibits discrimination on the basis of sex in education programs and activities that receive federal financial assistance. Specifically, Title IX prohibits sex discrimination; sexual harassment and gender-based harassment, including harassment based on actual or perceived sex, gender, sexual orientation, gender identity, or gender expression; sexual assault; sexual exploitation; domestic violence; dating violence; and stalking. For more information regarding your rights under Title IX, please visit: https://windward.hawaii.edu/Title_IX/.

Windward Community College is committed to the pursuit of equal education. If you or someone you know has experienced sex discrimination or gender-based violence, WCC has resources to support you. To speak with someone confidentially, contact the Mental Health & Wellness Office at 808-235- 7393 or Kaahu Alo, Designated Confidential Advocate for Students, at 808-235-7354 or kaahualo@hawaii.edu. To make a formal report, contact the Title IX Coordinator, Karla K. Silva-Park, at 808-235-7468 or karlas@hawaii.edu.

ACADEMIC INTEGRITY

Work submitted by a student must be the student's own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author. Students will receive a failing grade for plagiarized assignments.

All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

ALTERNATE CONTACT INFORMATION

If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

Location: Alakai 121

Phone: 808-235-7422

Email: wccaa@hawaii.edu

Spring 2020 Botany 130 LAB SCHEDULE

Date	Lecture Topic
August 25	<p>Introduction to Lab, Plants & Identification (campus and lab)</p> <p>http://hawaii.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.newland/how-did-life-emerge-here/</p> <p>What is a plant? What are the organs and tissues of plants?</p> <p>How to the plants relate to and mirror the environment now (ecology) and then evolution? **KEEP this question in mind throughout our class!</p> <p>PLANT STUDY (1) Roots Stems Leaves of ONE Hawaiian plants for pattern recognition. ONE flower--what are the 'modified leaves' of Hibiscus?</p> <p>LAB INTRODUCTION TO PROJECT (1) <i>Transpiration</i></p> <p>WHY do plants need water? How do plants need water? What is transpiration? DO you think all (Hawaiian) plants need and use water the same way? HOW could this influence the Hawaiian plant communities?</p> <p>GARDEN PROJECT 1</p> <p>You choose or will be given your plant and/or area to work with (literally) throughout our semester.</p> <p><i>Borne of volcanoes...evolved in isolation...kinolau of KŪ...lehua...keystone species holds...</i></p>
Sept 1	<p>WATER, LIGHT and Hawaiian plants.</p> <p>WHY do plants need water and light? How do plants need water and light? What is photosynthesis? DO you think all (Hawaiian) plants need and use water and light the same way? HOW could this influence the Hawaiian plant communities?</p> <p>How are plants adapted to harvest light? What IS light? How are plants adapted to take in CO₂ and make chemical energy? Why are many leaves flat? Are the upper and lower surfaces the same?</p> <p>PLANT STUDY (2) Roots Stems Leaves of select Hawaiian plants for mastery with pattern maps</p> <p>LAB START PROJECT (1) <i>Transpiration</i>)</p> <p>(Transpiration of diverse Hawaiian plants.</p> <p>TRANSPIRATION EXPERIMENTS AND PHOTOSYNTHESIS LOCAL and GLOBAL IMPLICATIONS start!</p> <p>RESEARCH PROJECTS (1)—Introduction to inquiry with the scientific method and project</p> <p>GARDEN PPROJECT (2)</p>
8	<p>HAWAIIAN PLANT DIVERSITY-LEARN NAMES!</p> <p>PLANT STUDY (3) Roots, Stems, Leaves of select Hawaiian plants for mastery with pattern maps</p> <p>LAB PROJECT (2, 3)</p> <p>Grow Hawaiian Plants (lab) and Spore Plants (campus and lab), DNA extraction</p> <p>RESEARCH PROJECTS (2)—Project design with clear questions, hypotheses observations/experiment. What do you need? Submit list of materials at end of class</p> <p>GARDEN PPROJECT 3</p>
15	<p>FIELD TRIP (1) to Hui Ku Maoli Ola Kaneohe Native Plant Nursery (Participation and write up--directions will be discussed in class)</p>
22	<p>HAWAIIAN FERNS AND LOWER VASCULAR PLANTS (campus and lab)</p> <p>PLANT STUDY (4) Ferns and lower vascular plants</p> <p>LAB PROJECT (4)</p> <p>Plant Interactions</p> <p>RESEARCH PROJECTS (3)—Project begins</p> <p>GARDEN PPROJECT 4</p>
29	<p>Field Trip (2) to Na Pohaku O Wahine Native Plant Restoration Site</p>

	http://www.ahahui.net/PROGRAMS/NaPohaku.html
OCT 6	PLANT STUDY (5) Hawaiian Flowering plants--diversity and recognition. LAB PROJECT (5) <i>follow up all lab project results</i> <i>Plant pigments</i> RESEARCH PROJECTS (4) —Monitor project and <i>herbarium introduction</i> and collection GARDEN PPROJECT (5)
13	PLANT STUDY (6) Hawaiian Plants Lab Study with Microscopy LAB PROJECT (6) TBD and follow up on all lab projects! RESEARCH PROJECTS (5) —Monitor project, herbarium introduction and collection
20	Field Trip (3) to Sandy Beach
27	HAWAIIAN PLANT DIVERSITY PLANT STUDY (7) Hawaiian Plants Lab Study with Microscopy, Invasives, Ferns and Herbarium LAB PROJECTS Completion RESEARCH PROJECTS Completion GARDEN PPROJECT 6
NOV 3	Field Trip (4) to Pu'u Ma'eli'eli Kaneohe Pill Box Two native ferns and a study in invasives! NOTE first 1/2 CLASS FIELD TRIP, second 1/2 CLASS to study what we collect!
10	HOLIDAY
17	Field Trip (5) to Koko Crater Garden Plants from diverse ecosystems in one garden!
24	HOLIDAY
DEC 1	HAWAIIAN PLANT IDENTIFICATION and preparation for final RESEARCH PROJECTS Presentation & Herbarium Completion! GARDEN PPROJECT 7 Completion
Dec 15	FINAL EXAM (lab and field)

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 and/or dates may be modified as we proceed.

Have a great semester!