Plants in the Hawaiian Environment

Bot130L

1 Credit (CRN 60129)

Hale ʻImiloa 101 or Virtual via Zoom
F 8:30 – 11:15 am

INSTRUCTOR: Teena Michael PhD
OFFICE: Hale Palanakila 142
OFFICE HOURS: In-person meeting by appointment only
Zoom meeting Topic: B130Lab
Join Zoom Meeting: https://hawaii.zoom.us/j/99637893636
Meeting ID: 996 3789 3636
Passcode: nanu
TELEPHONE: (808) 236-9114
EMAIL Best Contact: teena@hawaii.edu
EFFECTIVE DATE: Fall 2021

SUPPLEMENTAL
INSTRUCTOR SI: Serene Smalley
CONTACT: sereneds@hawaii.edu
OFFICE HOURS: To Be Announced
Effective Date: Fall 2021

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

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

CATALOG 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/)

Windward Community College is an equal opportunity, affirmative action institution.
After completing the Agripharmatech Certificate Program, students will be able to:

- Apply knowledge gained in plant sciences: identify plants, propagate/cultivate/maintain plants in vivo and in vitro
- Apply knowledge gained in microbial sciences: prepare/maintain bacterial cultures for genetic transformation and bioassay tests
- Conduct plant biotech and/or pharmacognosy research

**Activities Required at Scheduled Times Other than Class Times**

- Complete lab assignments including projects with photodocumentation and write ups
- Participate in field trips (in person and/or virtual), think about your experience and what you learned—document this!

**STUDENT LEARNING OUTCOMES**

As a result of taking this course, students can expect to attain the following 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, ASSESSMENT AND GRADING**

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.

*Note! The diversity of our assignments supports the successes of diverse learners.*

**FIELD TRIPS**

Our f2f and virtual 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.* Think about telling the stories of native Hawaiian plants!

**Attendance and participation during class and field trips is essential for learning native Hawaiian plants. Transportation to field trips is the responsibility of the student.**

**PROJECTS**

- **RESEARCH 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.

- **LAB PROJECTS** will be conducted in class to augments learning of the relationships of plant form and function as relevant to Hawaiian plants.
- **GARDEN PROJECTS** in which each student will be given a plant for growing at home and when possible, a plant and/or area of one of our gardens on WCC campus near Hale 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.

### ASSESSMENT TASKS AND GRADING

<table>
<thead>
<tr>
<th>Grades</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercises, Quizzes, Reflections</td>
<td>100</td>
</tr>
<tr>
<td>Field Trips (5) 20 points each</td>
<td>100</td>
</tr>
<tr>
<td>Research Project</td>
<td>50</td>
</tr>
<tr>
<td>Lab Projects</td>
<td>50</td>
</tr>
<tr>
<td>Garden Project</td>
<td>50</td>
</tr>
<tr>
<td>Photo ‘Herbarium’ 10 Species</td>
<td>50</td>
</tr>
<tr>
<td>Final Exam</td>
<td>100</td>
</tr>
</tbody>
</table>

**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.

Last day to withdraw with a “W” grade is 1 November, 2021.

### LEARNING RESOURCES


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 Accessibility Counselor to discuss reasonable accommodations that will help you succeed in this class. Roy Inouye can be reached at (808) 235-7448, royinouy@hawaii.edu, or you may stop by Hale Kāko‘o 106 for more information.

SEX DISCRIMINATION AND GENDER-BASED VIOLENCE RESOURCES (TITLE IX)

Windward Community College is committed to providing a learning, working, and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking.

If you or someone you know is experiencing any of these, WCC has staff and resources to support and assist you. To report an incident of sex discrimination or gender-based violence, as well as receive information and support, please contact one of the following:

- UH Confidential Advocate
  - Phone: (808) 348-0663
  - Email: Advocate@hawaii.edu
- Karla K. Silva-Park, Title IX Coordinator
  - Phone: (808) 235-7468
  - Email: karlas@hawaii.edu
  - Office: Hale Kāko‘o 128

As a member of the University faculty, I am required to immediately report any incident of sex discrimination or gender-based violence to the campus Title IX Coordinator. Although the Title IX Coordinator and I cannot guarantee confidentiality, you will still have options about how your case will be handled. My goal is to make sure you are aware of the range of options available to you and have access to the resources and support you need.

For more information regarding sex discrimination and gender-based violence, the University’s Title IX resources and the University’s Policy, Interim EP 1.204, go to manoa.hawaii.edu/titleix/

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.

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: Alaka‘i 121. Phone: (808) 235-742
### FALL 2021 SCHEDULE

| August 27 | Introduction to Lab, Plants & Identification (campus and lab)  
http://hawaii.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.newland/how-did-life-emerge-here/  
What is a plant? What are the organs and tissues of plants?  
How to the plants relate to and mirror the environment now (ecology) and then evolution?  
**KEEP this question in mind throughout our class!**  
PLANT STUDY (1) Roots, Stems, Leaves of ONE Hawaiian plants for pattern recognition.  
ONE flower--what are the 'modified leaves' of Hibiscus?  
**Kits available!**  
DO make drawings, write reflection on what you learn! Post to Assignments in Laulima |
| --- | --- |
| Sept 3 | PLANT STUDY (2) Roots, Stems, Leaves of Hawaiian plants for pattern recognition with pattern maps. Review the flowers from lab 1  
LAB INTRODUCTION TO PROJECT (1) Transpiration  
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?  
WATER, LIGHT and Hawaiian plants.  
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?  
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?  
TRANSPIRATION observation or experiment—plan and start!  
LAB Project 2 (Seed Bank)  
Seed bank sampling! Discuss briefly and start!  
GARDEN PROJECT 1  
You choose or will be given your plant and/or area to work with (literally) throughout our semester. To accommodate this during the pandemic, you will be given a plant to take home--grow and keep!  
Borne of volcanoes...evolved in isolation...kinolau of KU...lehua...keystone species holds...  
RESEARCH PROJECTS Background (1)—Introduction to inquiry with the scientific method and project |
| 10 | HAWAIIAN PLANT DIVERSITY  
PLANT STUDY (3) Roots, Stems, Leaves of select Hawaiian plants for mastery with pattern maps  
LAB PROJECT (2, 3)  
Grow Hawaiian Plants (lab) and Spore Plants (campus and lab), preparation for DNA extraction  
RESEARCH PROJECTS (2)—Project design 1 What is your question? Design hypotheses observations/experiment. What do you need? |
<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Field Trip (1)</td>
<td>to Hui Ku Maoli Ola Kaneohe Native Plant Nursery (Participation and write up--directions will be discussed in class) OR virtual substitution</td>
</tr>
<tr>
<td>24</td>
<td>HAWAIIAN FERNS AND LOWER VASCULAR PLANTS (campus and lab)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLANT STUDY (4)</td>
<td>Ferns and lower vascular plants</td>
</tr>
<tr>
<td></td>
<td>LAB PROJECT (4)</td>
<td>Plant Interactions</td>
</tr>
<tr>
<td></td>
<td>RESEARCH PROJECTS (3)</td>
<td>Project begins</td>
</tr>
<tr>
<td>OCT</td>
<td>Field Trip (2)</td>
<td>to Na Pohaku O Wahine Native Plant Restoration Site</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.ahahui.net/PROGRAMS/NaPohaku.html">http://www.ahahui.net/PROGRAMS/NaPohaku.html</a></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>PLANT STUDY (5)</td>
<td>Hawaiian Flowering plants--diversity and recognition.</td>
</tr>
<tr>
<td></td>
<td>LAB PROJECT (5)</td>
<td>follow up all lab project results</td>
</tr>
<tr>
<td></td>
<td>Plant pigments OR pollination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RESEARCH PROJECTS (4)</td>
<td>Monitor project and herbarium introduction and collection</td>
</tr>
<tr>
<td>GARDEN PROJECT 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PLANT STUDY (6)</td>
<td>Hawaiian Plants Lab Study with Microscopy</td>
</tr>
<tr>
<td></td>
<td>LAB PROJECT (6)</td>
<td>TBD and follow up on all lab projects!</td>
</tr>
<tr>
<td></td>
<td>RESEARCH PROJECTS (5)</td>
<td>Monitor project, herbarium introduction</td>
</tr>
<tr>
<td>15</td>
<td>Field Trip (3)</td>
<td>to Sandy Beach</td>
</tr>
<tr>
<td>22</td>
<td>HAWAIIAN PLANT DIVERSITY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLANT STUDY (7)</td>
<td>Hawaiian Plants Lab Study with Microscopy, Invasives, Ferns and Herbarium</td>
</tr>
<tr>
<td></td>
<td>LAB PROJECTS Completion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RESEARCH PROJECTS Completion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GARDEN PROJECT 5</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Field Trip (4)</td>
<td>to Puʻu Maʻeʻelili Kaneohe Pill Box</td>
</tr>
<tr>
<td></td>
<td>Two native ferns and a study in invasives!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NOTE first 1/2 CLASS FIELD TRIP, second 1/2 CLASS to study what we collect!</td>
<td></td>
</tr>
<tr>
<td>11/5</td>
<td>HAWAIIAN PLANT DIVERSITY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLANT STUDY (8)</td>
<td>Hawaiian Plants Lab Study with Microscopy, Invasives, Ferns and Herbarium</td>
</tr>
<tr>
<td></td>
<td>LAB PROJECTS Completion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RESEARCH PROJECTS Completion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GARDEN PROJECT 6</td>
<td></td>
</tr>
<tr>
<td>11/12</td>
<td>Field Trip (4)</td>
<td>TBD</td>
</tr>
<tr>
<td>11/19</td>
<td>Field Trip (5)</td>
<td>to Koko Crater Garden</td>
</tr>
<tr>
<td></td>
<td>Plants from diverse ecosystems in one garden!</td>
<td></td>
</tr>
<tr>
<td>12/3</td>
<td>HAWAIIAN PLANT IDENTIFICATION and preparation for final</td>
<td></td>
</tr>
<tr>
<td></td>
<td>RESEARCH PROJECTS Presentation &amp; Herbarium Completion!</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GARDEN PROJECT 7 Completion</td>
<td></td>
</tr>
<tr>
<td>12/10</td>
<td>Final EXAM (lab and field)</td>
<td></td>
</tr>
</tbody>
</table>

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!

Windward Community College is an equal opportunity, affirmative action institution.