

Botany 101 lecture/lab
General Botany CRN 63069

4 units Hale 'Imiloa 101

TR 4:00 – 6:30 pm

INSTRUCTOR: Teena Michael PhD
OFFICE: Hale 'Imiloa 130
OFFICE HOURS: W 9:00 to 10:00 am & F 11:00 to 12:00 and 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 Hawai'i 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 plant structure, function, reproduction, and evolution; plants in relation to the environment and human activities. Lecture/laboratory/field trip course.
(3 hours lecture, 3 hours laboratory)

Recommended Preparation: High school biology

Activities Required Other Than Class Times:

Preparation for lecture and lab components of class, writing assignments and projects.
Possible field trip during class time or alternative time as arranged in class.

REQUIREMENT COURSES SATISFIES

AT WCC (<http://windward.hawaii.edu/Courses/BOT101/>)

- Associate in Arts – Biological Sciences (DB)
- Associate in Arts – Natural Sciences Lab (DY)
- CA Agripharmatech: Plant Biotechnology (Required)
- CA Agripharmatech: Ethnopharmacognosy (Required)

STUDENT LEARNING OUTCOMES

Upon completion of the course, the student will be able to:

- Discuss basic concepts of plant morphology, anatomy, physiology, cytology, taxonomy and genetics.
- Discuss life cycles of division in Thallophyta, Bryophyta, Pteridophyta and Spermatophyta.
- Discuss interrelationship between plants and animals, and socio-economic importance of plants on humans.
- Discuss plant biotechnology.
- Operate dissecting and compound microscopes.
- Perform traditional and in vitro propagations.

COURSE TASKS

Service Learning

I encourage you to *volunteer* at a Hawaiian/Restoration site as part of Service Learning (<http://servicelearning.socialsciences.hawaii.edu/>). 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. See calendar option at <http://servicelearning.socialsciences.hawaii.edu/>

*We will also have service learning options on campus.

OPTIONS include *Reflections, Journal Assignments, Articles and Movie Reviews*. Choose options to total 25 points.

***Journals** Problems or questions for journal entries will be discussed in class. Each journal is 10 points and should be 1 or more single-spaced typed pages.

You will be evaluated on:

- 1) Your handling and understanding of basic information
- 2) Analysis of the problems
- 3) Inventiveness
- 4) Correct adding your own thoughts/opinions. List your reference(s).

OPTION 1. How have plants contributed to war? Choose a war that interest you then compile information, refer to your reference(s) as you write and *add your own thoughts on the subject.

***Reflections** Reflections on class content are options. Three points will be assigned for each reflection with 3=complete and exploratory or thoughtful, 2=a collection of information, 1=some information but not complete.

***Literature** (5 points/short article, 10 points long article) Review one article. Sources include the newspapers, magazines, journals (e.g. *Scientific American, National Geographic, Science News, Rolling Stone, or a scientific journal*). Write 3 paragraphs: *Paragraph one* will summarize the intent and information in the article. *Paragraph two* will summarize information from a web site that you find on the same subject. The *last paragraph* contains your thoughts about the information and/or subject.

***Movie** (5 points) Watch a movie and explain/explore the botany OR the biology that is relevant to botany involved in the movie. Examples include (but are not limited to!) *Food Inc., Emerald Forest, Botany of Desire...*

PROJECT

Class Project/Presentation (40 points) will be discussed in class.

Choose a topic near the beginning of the semester, form a group OR partner OR work solo then develop and present a PowerPoint or other form of presentation to the class. Each student will have 10-15 minutes for presentation.

* Project guidelines will be available and project examples include (*but are not limited to*):

- The *ecology*, evolution and ethnobotany of a native Hawaiian (or other Pacific Island) plant
 - Hawaiian uses of plants OR Tongan... Samoan... uses of plants!
- Ethnopharmacognosy OR An aspect of Botany that complements the student's field of study (Art, Nursing, English, Acting, Business, Medicine, Environmental Science, Forensics for example)
- The impact of plants on the history of the world via crop failures, mass migrations, the quest for new trade routes and wars

- Plants or organisms studied in botany as drugs—cultural perspectives and how they work at the level of cells, tissues...
- The architecture of plants
- Bioengineering with plants or GMO's
- Global warming and plants
- Plant behavior
- Politics of food
- Deforestation...Coral bleaching...The loss of bees...Forest Fires...Forests in general or Coral reefs in general!

Class presentations, movies, group exercises and worksheets, as well as lab techniques and investigations will be resources for you to learn the material, explore the significance of our studies—and succeed on the exams.

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!*

ASSESSMENT TASKS AND GRADING

Grades

Exam 1	100 points
Exam 2	100
Final Exam	125
Options *See Course Tasks	25
Quizzes/Exercises/ Extra Curricular	50
Botany Project	40
Lab Exam 1	50
Lab Final	50
Lab Notebook	60
	600 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%

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 November 3, 2016.

LEARNING RESOURCES

TEXTBOOK Berg, L. *Introductory Botany; plants, people and the environment* 2nd Edition. Brooks/Cole.

- While the text book is listed as required, alternative books are an option. Most include wonderful stories and examples and—as vintage editions can be very low cost. This is a non-comprehensive list of texts:
 - *Introductory Botany: Plants, People and the Environment*, L.R. Berg. Saunders College Publishing.
 - *Plant Biology*, T.L. Rost, M.G. Barbour, C.R. Stocking and T.M. Murphy. Thomson Brooks/Cole
 - *Introductory Plant Biology*, K.R. Stern. McGraw-Hill.
 - *Principals of Botany*, G. Uno. Brown. Note! This book is available used for ~\$1-6.

Websites (not comprehensive):

- <http://www.botany.hawaii.edu/faculty/carr/natives.htm>
- <http://www.pbs.org/wgbh/nova/methuselah/>
- <http://www.pbs.org/wgbh/nova/algae/>
- <http://www.pbs.org/wgbh/nova/flower/>
- <https://www.youtube.com/watch?v=uJESM-ep7EQ>
(What people eat around the world!)
- <http://www.pbs.org/wgbh/nova/nature/pollination-game.html>
- <http://www.foodopoly.org/>
- Botanical Society of America <http://www.botany.org/>
- Plants Database USDA <http://plants.usda.gov/>
- Native American Ethnobotany <http://herb.umd.umich.edu/>
- Centre for Phytochemistry and Pharmacology 1 <http://www.scu.edu.au/research/cp/>
- Centre for Economic Botany <http://www.rbgekew.org.uk/scihort/ecbot/index.html>
- Missouri Botanical Garden <http://www.mobot.org/welcome.html>
- Photosynthesis <http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookPS.html>
- Plant Anatomy & Glossary <http://dallas.tamu.edu/weeds/anat.html>

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 LECTURE SCHEDULE

Date	Lecture Topic	Textbook Chapter(s)
August 22	What is life? What is plant life? <i>Plant Scope & Design</i> <i>Lab: Mysteries of Botany How do we visualize cells & organs?</i>	1
24	The Plant Cell and Chemistry <i>Lab: Mysteries of Botany Plant Cells (& Chemistry)</i>	2 & 3
29	Plant Cells and Chemistry <i>Lab: Plant Cells & Tissues</i>	2 & 3 5
31	Plant Organs Roots & Tissues <i>Lab: Plant Body & Roots ** Notebook Check</i>	5, 6
September 5	HOLIDAY	
7	Water, Mineral Nutrition and Transport <i>Lab: Roots</i>	10
12	Plant Organs Stems & Tissues <i>Lab: Stems Primary Growth</i>	7
14	Plant Organs Stems & Tissues WOOD (Forensics) <i>Lab: Stems Secondary Growth</i>	7
19	Plant Organs Leaves <i>Lab: Leaves</i>	8
21	Leaves & Transpiration <i>Lab: Transpiration & Leaves Notebook Check</i>	
26	Exam 1 with lab exam 1	8
28	Plant Metabolism Photosynthesis <i>Lab: Transpiration & Photosynthesis</i>	4
October 3	Plant Metabolism Photosynthesis <i>Lab: Photosynthesis & Respiration</i>	
5 & 10	Growth Responses and Regulation <i>Lab: Plant Hormones & Tissue Culture</i> <i>Lab Exam 1 **DONE</i>	11
12 & 17	Life Cycles Cell Divisions Mitosis & Meiosis <i>Lab: Cell Division and Life Cycles</i>	13
19	Plant Genetics & Inheritance Notebook Check <i>Lab: DNA</i>	12, 14 & 15
24	Exam 2	16
26	Evolution of Species <i>Lab: Evolution in Hawaiian Plants</i>	16 & 17
31	Classification & Prokaryotes <i>Lab: Bacteria</i>	18
November 2	Fungi <i>Lab: Fungi</i>	21
7	Plant-like Protista! Algae <i>Lab: Algae</i>	20
9	Plant Kingdom! Bryophytes <i>Lab: Bryophytes</i>	22

14	Plant Kingdom! Lower (Seedless) Vascular Plants <i>Lab: Seedless Vascular Plants</i>	23
16	Plant Kingdom! Seed Plants Gymnosperms <i>Lab: Gymnosperms</i>	24
21	Plant Kingdom! Seed Plants Angiosperms & Co-evolution <i>Lab: Angiosperms</i>	25
23	Fruits, Flowers and Seeds <i>Lab: Angiosperms Biology of the Banana Split!</i>	9 11
28	Ecosystems & Projects	26
30	Human Impacts, & Projects	27
December 5	Human Impacts & Sustainability, & Projects <i>Lab: Open</i>	26 & 27
7	<i>Final Preparation!</i>	
DEC 12	Lecture and Lab FINAL EXAM 4:00-6:00	Notebook Due

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 trips may be added as we proceed!

Have a great semester!