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 studies to excellence.

CATALOG DESCRIPTION

Companion laboratory class to AQUA 201, The Hawaiian Fishpond. This class provides hands-on experiences studying Hawaiian fishponds, their construction and operation, oceanography, biology, ecology, and restoration (3 hours lab).

PREREQUISITES

No prerequisites. AQUA 201 The Hawaiian Fishpond or consent of instructor.

STUDENT LEARNING OUTCOMES

Upon completion of this course the student should understand and appreciate:

- the characteristics, construction and operation of the various types of Hawaiian fishponds;
- approaches and techniques to studying the oceanography, biology, and ecology of Hawaiian fishponds;
- the similarities and differences between traditional Hawaiian fishponds and modern aquaculture technologies; and
- the difficulties associated with fishpond restoration.

REQUIREMENTS SATISFIED BY THIS CLASS

- Natural Science General Education Core for the Associates Degree in Liberal Arts as a Biological Science Lecture Class (Natural Sciences Group 1)
- Bio-Resources and Technology Academic Subject Certificate in Bio Resource Development and Management (Elective Set I: Technology, Utilization, and Management).
- Hawaiian Studies Academic Subject Certificate Requirements at Windward Community College (as an elective).
COURSE CONTENT

Course Content and Topics/Skills or Competencies

The student will demonstrate the acquisition of basic laboratory and field research skills, and knowledge relevant to the study of Hawaiian fishponds. These skills and knowledge include the following areas:

- the scientific method of inquiry, providing examples of its use, and demonstrating this method through written reports and summaries of class laboratory and field activities;
- the collection, reduction, interpretation, and presentation of scientific data in the form of laboratory/field reports and summaries;
- construction, characteristics, operation, and management (stocking, cultivation, harvesting and maintenance) of the various types of traditional Hawaiian fishponds and how they relate to modern aquaculture practices;
- the use of some of the tools used to study the oceanography, biology and ecology of Hawaiian fishponds (e.g., dichotomous keys, water samplers, plankton nets, aquatic animal traps & nets, microscopes, scales, pH meters, nutrient test kits, oxygen meters, salinometers, refractometers, conductivity meters, turbidimeters, light meters, Secchi disks, and other analytical tools);
- analysis of the physical and chemical environment (e.g., bathymetry, water circulation, tidal flux, stratification, water chemistry and properties, sediments, and nutrients) provided to the species that inhabit the fishpond;
- identification, classification and characteristics of fishpond species, fish external and internal anatomy;
- identification of fish diseases;
- the integration between traditional practices and modern aquaculture methodologies (by comparing traditional fishponds to modern aquaculture facilities), archaeological analysis of a fishpond; and
- Hawaiian fishpond restoration: approaches, problems and possible solutions, and examples of restoration projects.

MODE OF INSTRUCTION

The previously described objectives will be achieved through the aid of the following learning activities:

- Active participation in laboratory and field activities;
- Laboratory/Field lecture and demonstrations;
- Multimedia presentations;
- Data collection using instruments and measurement tools;
- Computer-assisted data collection activities;
Recording and interpreting results from laboratory and field activities;
Written reports and/or summaries of laboratory activities; and
Group presentations.

The material presented in all modes of instruction will be of an introductory nature but sufficient in content to allow serious study by the interested student. Assigned readings will serve to provide background and supplemental information to provide a broad base for a basic study. Class lectures will build upon this base, helping to focus the student on some of the more important details.

ASSESSMENT AND GRADING

LABORATORY NOTEBOOK. The student will maintain a laboratory notebook to record all notes, observations, and information gathered before and during laboratory and field activities. This notebook must be brought to every laboratory period. This notebook will be collected and graded twice during the semester (15 points for the first collection; 35 points for the final collection; 50 points total). The type of notebook and the kind of information required will be explained during the introductory lab session.

LABORATORY/FIELD REPORTS AND SUMMARIES. The student will complete a total of 15 written laboratory/field reports or summaries (10 points each). Each report or summary must be completed and turned in no later than the beginning of the first laboratory meeting after the assignment was given (150 points total). The nature of the report or summary will depend upon the activity.

LABORATORY/FIELD ATTENDANCE AND PARTICIPATION. The student will attend and actively participate in all laboratory and field activities (50 points). A student missing more than two of these sessions will not receive a passing grade for the course.

GROUP PRESENTATION. The class will be divided into a number of small groups consisting of 3-4 students each. Each group will complete an approved project on a fishpond-related topic (project may be a research project or involve the development of an education module). Documentation of project completion will take place in the form of a short oral presentation made during the time scheduled for final exams (50 points). All students in the group must participate in this presentation.

Grading Summary

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Laboratory Notebook 1</td>
<td>50</td>
</tr>
<tr>
<td>Laboratory Notebook 2 (Field Summary)</td>
<td>50</td>
</tr>
<tr>
<td>Laboratory/Field Attendance and Participation</td>
<td>50</td>
</tr>
<tr>
<td>Laboratory Project</td>
<td>100</td>
</tr>
<tr>
<td>Topic Description</td>
<td>20</td>
</tr>
<tr>
<td>Presentation</td>
<td>20</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>20</td>
</tr>
<tr>
<td>Write-up/Paper</td>
<td>40</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>250</strong></td>
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Letter grades will be assigned as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>90% or above in total points.</td>
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<tr>
<td>B</td>
<td>80-89.9% of total points.</td>
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<tr>
<td>C</td>
<td>65-79.9% of total points.</td>
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<tr>
<td>D</td>
<td>55-64.9% of total points.</td>
</tr>
<tr>
<td>F</td>
<td>Below 55% of total points or informal or incomplete official withdrawal from course.</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete; given at the INSTRUCTOR'S OPTION when student is unable to complete a small part of the course because of circumstances beyond his or her control. It is the STUDENT'S responsibility to make up incomplete work. Failure to satisfactorily make up incomplete work within the appropriate time period will result in a grade change for &quot;I&quot; to the contingency grade identified by the instructor (see catalog).</td>
</tr>
<tr>
<td>CR</td>
<td>65% or above in total points; the student must indicate the intent to take the course as CR/NC in writing by the end of the 10th week of classes (see catalog).</td>
</tr>
<tr>
<td>NC</td>
<td>Below 65% of total points; this grade only available under the CR/NC option (see above and see catalog).</td>
</tr>
<tr>
<td>N</td>
<td>NOT GIVEN EXCEPT UNDER EXTREMELY RARE CIRCUMSTANCES (e.g., documented serious illness or emergency that prevents the student from officially withdrawing from the course); never used as an alternative for an &quot;F&quot; grade.</td>
</tr>
<tr>
<td>W</td>
<td>Official withdrawal from the course after the third week and prior to the end of the 10th week of classes (see catalog).</td>
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Waiver of minimum requirements for specific grades may be given only in unique situations at the instructor's discretion. Students involved in academic dishonesty will receive an "F" grade for the course. Academic dishonesty is defined in WCC's college catalog.

The instructor may announce extra credit options at various times during the course. However, in order for the student to be eligible for any extra credit activity, the student must demonstrate responsibility in completing all regular course assignments. In addition, the student must demonstrate a sustained interest in the content of the course by regularly attending and participating in class. Some extra credit assignments may require same-day class attendance in order for the student to be eligible to receive credit for these assignments. The instructor is not obligated to accept projects for extra credit.

Waiver of minimum level of achievement and course requirements may be given only in unique situations at the instructor’s discretion.

Students involved in academic dishonesty will receive an “F” grade for the course.

**STUDENT RESPONSIBILITIES**

Students should carefully review the attached sheet detailing inherently dangerous activities of this course and sign the appropriate U.H. Assumption of Risk and Release and Medical Consent forms.

Students are expected to participate in all laboratory and field activities and complete all course assignments on time.

Students are expected to be prepared in advance when they arrive at class. Being prepared includes
the following: having already read text materials (e.g., textbook readings and handouts) assigned for that day’s activities, bringing required work materials (e.g., lab notebook, textbook, handouts, writing supplies, etc.), and having completed any assigned pre-lab tasks.

Any changes in the course schedule, such as examination dates, deadlines, etc., will be announced ahead of time in class. It is the student’s responsibility to be informed of these changes.

It is also the student’s responsibility to be informed about deadlines critical to making registration changes (e.g., last day of drop period and last day for making an official withdrawal.

**HOW TO SUCCEED IN THIS CLASS**

Understanding biological science involves understanding many difficult concepts and vocabulary, not just knowing facts. The student should know that the details to these concepts are important. In addition, the student will be introduced to hundreds of new words. In some cases, words that are familiar in a context other than biology will be introduced in the context of biology. The student will need to understand and use these terms in a biological science context.

Students are expected to participate in all lecture activities and complete all course assignments on time. The student will not succeed in this class without taking careful lecture notes and reading the corresponding material in the textbook. As soon as possible (best if done on the same day), the student should copy over these lecture notes filling in gaps and missing information by referring to the textbook and other resources provided. The student should carefully review these rewritten lecture notes as often as possible.

In addition to copying over lecture notes, study activities should include drawing labeled diagrams or graphs that illustrate important biological phenomena (e.g., the internal structure of the cell, the stages of cell division, or the anatomy of the heart). These diagrams need not be works of art, but should clearly illustrate significant information. Before an exam, it would be useful to redraw these labeled diagrams and graphs from memory.

The student should make flashcards for each new vocabulary word presented (refer to lecture outlines for a lists of required terms). The student should use these cards for self-testing as often as possible. The student should also practice using the words to explain biological concepts.

The student should do all of the recommended study guide activities and review all of the Internet resource materials provided.

The textbook and other resources may include useful study questions. The student should write out answers to all of these questions as though they were required assignments. Students could exchange these answers and provide constructive feedback to each other.

The student should read the textbook materials corresponding to a particular lecture before and after that lecture.

Students are recommended to establish study groups and study together. The students in these groups may test each other’s knowledge and understanding of the information. They may also take turns teaching each other.
The student should ask the instructor to explain the things that the student does not understand.

**TEXTBOOK AND OTHER ASSIGNED INSTRUCTIONAL MATERIALS**

*No specific textbook will be assigned for this class. Instead, students will receive handouts for each lab activity.*

**POSSIBLE LEARNING RESOURCES**


Titcomb, M., 1978. Native Use of Marine Invertebrates in Old Hawaii. Pacific Science, 32(4): 325-386. [This text is no longer in print; copies may be provided as a PDF file downloadable from the course website.]


Other materials may include handouts or Internet resources developed by the instructor. Handouts and selected readings from various texts will also be distributed in class or downloaded from the class site.

AQUA 201 LABORATORY AND FIELD ACTIVITIES

Students enrolled in AQUA 201 are advised that certain required course activities are inherently dangerous and may require normal physical abilities. Students are therefore required to read about the inherently dangerous activities described below. In addition, students must read and demonstrate knowledge of their responsibilities while engaged in these activities.

Some students may have physical conditions that restrict their participation in certain laboratory activities. Respiratory ailments, certain allergies, and pregnancy may be among these conditions. Students exhibiting any of these conditions, or any other condition that may be impacted adversely by participation in the activity, should consult a physician.

INHERENTLY DANGEROUS ACTIVITIES

Students in the science laboratory may be exposed to chemicals (e.g., formaldehyde, organic solvents, acids, and other caustic chemicals), chemical fumes, laboratory equipment and supplies (e.g., scalpels, razor blades, glass slides, coverslips, and electrical equipment), toxic or irritating properties of living and dead animals, human organic matter (e.g., saliva and blood), and other materials necessary to laboratory activities of this or other laboratory classes. Other possible hazards include broken glass on the floor or counters, combustible materials (e.g., bunsen burner gas), and slippery spills.

During field activities students face risks such as accidents while in route to and from field destinations, falling out of boats, slipping on wet surfaces, stepping on sharp objects, large waves, strong currents, and dangerous marine life.

RESPONSIBILITIES OF STUDENTS IN THE LABORATORY

1. Students should be familiar with safety procedures and take appropriate precautions at all times to insure the safety of every student in the lab.

2. Students should follow instructions carefully, especially when hazardous conditions occur or
hazardous materials are being used.

3. Students should locate the placement of safety equipment and supplies in the laboratory: safety shower, eye wash station, fire extinguisher, and first aid kit. Students should understand the use of this equipment. Also note the locations of exits.

4. Anyone injured in the lab should inform the instructor immediately and take immediate action to reduce the risk of further injury.

5. Students should familiarize themselves with the fire procedures. Extinguish small fires, but leave the building immediately should a major fire occur. Notify the appropriate authorities -- don’t assume someone else remembered to do it. Meet with other students and your instructor outside the building before leaving so that an accurate headcount may be made.

6. Students should dress appropriately in the lab. Students may elect to supply their own gloves and protective aprons or laboratory coats. Some lab activities may require protective eyewear (provided for the activity by WCC).

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9. All organisms, living or dead, should be treated with care and respect. Avoid direct handling when possible.

10. The safe use of specific equipment and tools (e.g., microscopes, slides, scalpels, and pipettes) will be demonstrated by the instructor during the laboratory sessions. Students should be sure they understand this usage.

11. Students should clean up any supplies used and should return materials where they belong as instructed. Any material spilled should be cleaned appropriately. Report any hazardous spills or breakages.

12. Broken glass and sharp metal waste should be placed only in those receptacles marked for such disposal -- do not put these materials in normal trash receptacles.

13. Some chemical wastes may not be dumped into laboratory sinks. In such circumstances an appropriate container will be provided for this waste in the lab.

14. Organic waste resulting from animal dissection activities should be disposed of in the appropriate receptacle, not the ordinary trash receptacles.

15. Human organic materials (e.g., saliva and blood) must be disposed of in such a way as to eliminate any possibility for contamination and the spread of disease. Appropriate handling and disposal procedures will be explained when human materials are involved in the laboratory exercise.

16. After completing laboratory activities and clean up, students should wash their hands in the restroom to avoid spreading contamination and hazardous chemicals.

17. The laboratory is a place for learning. Therefore, eating, drinking, and playing around is prohibited during the laboratory session. Students exhibiting unsafe or inappropriate behavior in the lab may be asked to leave and may be given an “F” grade for the course.

**RESPONSIBILITIES OF STUDENTS IN THE FIELD**
1. Field excursions may involve carpooling to field destinations. Drivers are expected to have valid Hawaii driver’s licenses, drive safely, and follow all traffic laws. Passengers should not disturb drivers.

2. When in the field, students should use the buddy system. Partners should have comparable physical skills and should keep track of each other at all times.

3. Students should wear clothing appropriate for the activity and should anticipate all possible weather conditions. Land/shoreline activities require loose-fitting clothing that protects the extremities from sunlight and abrasions (note that this clothing may get wet). Footwear should allow stable walking on rough and/or slippery surfaces (slippers are not acceptable footwear). A hat and sunglasses are also highly recommended. For water activities, a wet suit, or long pants and sleeves, worn over swim suits, are recommended. Gloves and protective footwear are essential. Students should apply sunscreen to all exposed skin areas.

4. When looking under rocks or ledges, students should be prepared for encounters with dangerous marine animals, such as eels, lion fish, and sea urchins. Unless specifically instructed to do so, students should not touch any marine organism.

5. Students should familiarize themselves with potential hazards in an area before beginning an activity. Watch for large waves and dangerous currents. If conditions should become dangerous after the activity starts (e.g., waves pick up or dangerous marine life enters the area), the student should leave the area immediately. Students should inform the instructor immediately when dangerous conditions arise. A student should never feel compelled to do an activity that seems hazardous. A student should refuse to carry out an activity that exceeds his or her physical capabilities.

6. Anyone injured in the field should inform the instructor immediately and take immediate action to reduce the risk of further injury. Before an activity begins, students will be informed of the location of the first aid kit (which will be taken on every excursion).

7. No one should operate a power boat without specific training. While in power boats, students should remain seated at all times. No power boat should be used without proper safety gear (i.e., first aid kit, life vests, oars, anchor, flares and other essential gear).

8. Consumption of alcoholic beverages is prohibited during any class activity, including field activities.

**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.