AQUA 201 The Hawaiian Fishpond
CRN 62142 * 03 Credit Hours
Wednesday 6:00 – 8:45 P.M.

INSTRUCTOR: David A. Krupp, Ph.D
OFFICE: Hale 'Imloa 121A
OFFICE HOURS: M 9:00-10:00 AM; W 4:30-5:30 PM; Online M 7:30-8:30 PM
TELEPHONE: 236-9121
EFFECTIVE DATE: Spring 2013

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College is committed to excellence in the liberal arts and career development; we support and challenge individuals to develop skills, fulfill their potential, enrich their lives, and become contributing, culturally aware members of our community.

CATALOG DESCRIPTION
An introduction into the history, development, biology and ecology, management, restoration, and future of Hawaiian fishponds. This course will study traditional Hawaiian fishponds, merging traditional knowledge with the principles of modern Western science. (3 hours lecture)

PREREQUISITES
No prerequisites. Although it would be useful if the student has taken a class in biology before enrolling in AQUA 201. The student is also recommended to take the companion laboratory course AQUA 201L concurrently with AQUA 201.

REQUIREMENTS SATISFIED BY THIS CLASS
• May be used to satisfy AA and Bachelor’s degree diversification requirements for a biological science (DB) class at different campuses within the UH system.
• May partially satisfy requirements for the University of Hawai‘i Marine Option Program Certificate as a marine-related elective.
• May partially satisfy requirements for the Windward Community College Academic Subject Certificate in Bio-Resources and Technology, Bio-Resources Development and Management Track (Elective Set I: Technology, Utilization and Management).

STUDENT LEARNING OUTCOMES
The learning outcomes for this course are:
• Explain the process and philosophical basis of scientific inquiry.
• Distinguish between the types of traditional Hawaiian fishponds, the history of their construction and use throughout the Hawaiian Islands, how and where they were constructed, their operation and management, their characteristics, and their biota.
• Describe the oceanography, biology and ecology of Hawaiian fishponds.
• Describe the basic principles of aquaculture, including pond dynamics, feeding regimes, cultivated species propagation and growth, disease management, production, harvesting and maintenance.
• Discuss the status of Hawaiian fishponds in modern times, including their restoration and their future.
COURSE CONTENT

- The philosophy and characteristics of science and the scientific method.
- The characteristics of living things, how they are classified and named.
- Basic ecological principles, especially those applying to aquatic ecosystems and fishponds.
- The types of traditional Hawaiian fishponds, the history of their construction and use throughout the Hawaiian islands, how and where they were constructed, their operation and management (stocking, cultivation, harvesting and maintenance), their characteristics, and their biota.
- The oceanography of Hawaiian fishponds (water circulation, stratification, water chemistry and properties, sediment composition and characteristics, and biogeochemical cycles).
- The biology of important fishpond species, especially their modes of nutrition, life cycles, and interactions with other fishpond species as well as their physical environment.
- The basic principles of aquaculture, including pond dynamics, feeding regimes, cultivated species.
- Propagation and growth, disease management, production, harvesting and maintenance.
- The operation and functioning of the fishpond in the ahupua’a.
- The integration between traditional practices and modern aquaculture methodologies.
- Hawaiian utilization of fishpond species.
- Modern fishpond problems (disuse and natural degradation, agricultural and urban development, pollution, and invasive species).
- Hawai‘i fishpond restoration: approaches, problems and possible solutions, and examples of restoration projects.
- The future of Hawaiian fishponds: whether they will become mere interesting archeological curiosities or they will represent models of sustainability for the future.

COURSE TASKS ASSESSMENT AND GRADING

RESEARCH PAPER. The student will complete a formal library research report on an approved fishpond-related topic. A good research topic will cross disciplines providing scientific, historical, and cultural information. Specific details on the format of this report will be presented in class (100 points total).

QUIZZES. The student will take a minimum of ten quizzes (15 points each; 100 points total) administered through the Internet (Laulima) during specified time periods. These quizzes will address the detailed content and major concepts presented in the lectures, lecture outlines, text readings, and study guide activities. If the student takes more than ten quizzes, only the best ten quiz scores will be used in calculating the student’s total points. Since these quizzes may be taken using home computers connected to the Internet, students may refer to instructional resources (text, study guide, lecture notes, etc.) while taking the quizzes. However, each quiz will be timed, the student having only 20 minutes to complete. Because the student will be able to drop several of the lowest quiz scores, no make-up quizzes for missed quizzes will be administered for any reason including computer/Internet crashes, illnesses, and emergencies (the student will receive no score for missed quizzes).

EXAMINATIONS. The student will take one midterm examination (100 points) and a non-cumulative final examination (100 points) to demonstrate understanding of information presented primarily during lectures. These proctored exams will be closed-book exams and students will not be allowed to refer to texts, notes, nor other materials while taking the exam. NO RETESTS will be given. The student must take the exam during the scheduled time period.
A student missing an exam because of an illness or legitimate emergency may take a make-up exam as soon as possible after the student returns from the illness and as determined by the instructor. In such a circumstance, the student should make every reasonable attempt to contact the instructor before the exam period is over (or as soon as possible). While make-up exams will cover the same content area as a missed exam, the exam format and specific questions may be different.

The assignment of points will be according to the following protocol:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tbody>
<tr>
<td>Research Paper</td>
<td>100</td>
</tr>
<tr>
<td>Quizzes</td>
<td>150</td>
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<tr>
<td>Midterm Examination</td>
<td>100</td>
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<tr>
<td>Final Examination</td>
<td>100</td>
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<td>TOTAL</td>
<td>450</td>
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Letter grades will be assigned as follows:

<table>
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<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>
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<tr>
<td>F</td>
<td>Below 55% of total points or informal or incomplete official withdrawal from course.</td>
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<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. 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>
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<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>
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<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>
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<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>
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<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.
LEARNING RESOURCES

Required Textbook:


Supplemental Reading (some of these, or sections of them, may be made available as pdf files on the course Laulima site):


Handouts and selected readings from various texts will also be distributed in class or through the Internet.

STUDENT RESPONSIBILITIES
The student is expected to attend and actively participate in all course lectures and activities, and complete all assignments, quizzes and examinations on time.

The student is expected to be prepared in advance before the class sessions. Being prepared includes the following: having read text materials (e.g., textbook readings and other resources) assigned for that day's activities and bringing required work materials (e.g., textbook, handouts, writing supplies, etc.) to the session.

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

Students should expect a level of difficulty comparable to other 200-level science classes intended for non-science majors. When difficult concepts and detailed information are presented, it is the student's responsibility to take the appropriate steps to learn and understand these concepts and information.

Science courses at WCC generally require two to three hours of independent private study time for each hour in class. However, because of the nature of the material presented in AQUA 201, more study time may be required (depends upon the student's science/biology background). It is the student's responsibility to allocate the appropriate time needed for study in an environment conducive to quality study. The student must budget time efficiently and be realistic about all personal and professional commitments that consume time.

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 card 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.

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**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 ʻAkoakoa 213 for more information.*
<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>TEXT CHAPTERS*</th>
</tr>
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<tbody>
<tr>
<td>9-Jan</td>
<td>Course Introduction</td>
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<tr>
<td>16-Jan</td>
<td>Science as a Way of Knowing Interpreting the Universe and How We Fit Into It</td>
<td>15</td>
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<tr>
<td>23-Jan</td>
<td>Types of Hawaiian Fishponds, Their History, Characteristics, Operation and Management</td>
<td>1, 2, 10, 11, 12, 13, 14, 16</td>
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<tr>
<td>30-Jan</td>
<td>Basic Ecological Principles</td>
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<tr>
<td>6-Feb</td>
<td>Oceanography of Hawaiian Fishponds</td>
<td>6</td>
</tr>
<tr>
<td>13-Feb</td>
<td>Scientific Classification of Living Things Hawaiian Nomenclature of Living Things</td>
<td>Hawaiian Nomenclature of Living Things</td>
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<tr>
<td>20-Feb</td>
<td>The Biology and Utilization of Fishpond Life I</td>
<td>3</td>
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<tr>
<td>27-Feb</td>
<td>The Biology and Utilization of Fishpond Life II</td>
<td>3</td>
</tr>
<tr>
<td>6-Mar</td>
<td>MIDTERM EXAMINATION</td>
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<tr>
<td>13-Mar</td>
<td>Basic Principles of Aquaculture: Types of Aquaculture, Cultivated Species, and Best Practices</td>
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<tr>
<td>20-Mar</td>
<td>Propagation, Feeding, Disease Management, Production, Harvesting and Maintenance</td>
<td>4, 5, 7, 8, 14</td>
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<td>27-Mar</td>
<td>SPRING RECESS</td>
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<td>3-Apr</td>
<td>Application of Biotechnology in Aquaculture</td>
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<tr>
<td>10-Apr</td>
<td>Integration of Traditional Practices and Modern Aquaculture Methodologies</td>
<td>4, 5, 7, 8, 14, 17</td>
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<td>17-Apr</td>
<td>Hawaiian Fishpond Archaeology</td>
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<td>24-Apr</td>
<td>Modern Hawaiian Fishpond Problems Restoration of Fishponds</td>
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<tr>
<td>1-May</td>
<td>The Future of Hawaiian Fishponds</td>
<td>9, 18</td>
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<tr>
<td>8-May</td>
<td>FINAL EXAMINATION</td>
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*Lecture outlines and additional reading sources may be required.