Department of Natural Sciences
Minutes of the Dec. 14, 2012 Meeting

Members Present: Allison Beale, Joe Ciotti, Sam Craddock, John Kaya, Dave Krupp, Ross Langston, Floyd McCoy, Brad Porter, Dave Ringuette, Inge White, Michelle Milliefsky, Letty Colmenares.

Guests Present: Rick Murray

1. Approval of Minutes. The minutes of the Nov 16 meeting posted on the website was approved. [http://windward.hawaii.edu/natural_sciences/Documents.php](http://windward.hawaii.edu/natural_sciences/Documents.php)

2. Thefts & Security. Safety & Security Manager Rick Murray updated the department that 4 cameras have been installed at the BMGC trailer and “no trespassing” signs have been posted at the perimeter of the garden. These cameras can be monitored inside the trailer/lab, Inge’s office and Rick’s office. Rick mentioned that in the event the thieves are identified, they should be prosecuted otherwise, all these measures would be for nothing. In case there are suspicious looking characters, to please call the security in real-time, 235-7355. After some discussion, it was agreed that security camera signs will also be posted. Inge requested that everybody stay away from the garden during the winter break to monitor the area easily.

3. VCAC Updates
   • Deadline for grades is on Dec 18, 2012.
   • Deadline for GenEd SLO Communication Form A completion is on Dec 28, 2012.
   • Starting spring 2013, all faculty (including Lecturers) must submit [http://windward.hawaii.edu/Faculty_Staff/Submit_Hours/](http://windward.hawaii.edu/Faculty_Staff/Submit_Hours/) and post “office hours.”
   • According to VCAC Richard Fulton, classes that have only 6 to 7 students two days before classes start (Jan 7, 2013) will be cancelled. The official mandate is to have 15 students per class.
   • Summer schedule of classes will be published during the winter break.
   • Spring Convocation will be on Jan 3, 2013. The main topics will be Hawaii Graduation Initiative and the GenEd SLO Assessment.

4. HMMP Plan. A clarification on the WCC Hazardous Material and Hazardous Waste Management Program as to who are designated as responsible for the implementation of this program in their areas. Is it the individual instructor teaching the course or is it the senior faculty or the so-called discipline coordinator?

<table>
<thead>
<tr>
<th>Lab/Instructor</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Lab</td>
<td>Chemistry Instructor</td>
</tr>
<tr>
<td>Biology Lab</td>
<td>Biology Instructor</td>
</tr>
<tr>
<td>Art Lab</td>
<td>Art Instructor</td>
</tr>
<tr>
<td>Photography Lab</td>
<td>Photography Instructor</td>
</tr>
<tr>
<td>Operations and Maintenance (O&amp;M) Shop</td>
<td>O &amp; M Supervisor</td>
</tr>
<tr>
<td>Agriculture Building</td>
<td>Agriculture Instructor</td>
</tr>
<tr>
<td>Ceramics</td>
<td>Ceramics Instructor</td>
</tr>
</tbody>
</table>
Both VCAS Cliff Togo, WCC Coordinator WCC HMMP, and, Miles Nirei, EHSO Officer, clarified that the “instructor” is anybody (even a lecturer) who teaches a particular course and not the full-time faculty or discipline coordinator. This instructor has the responsibility to attend an annual training and to manage hazardous waste properly after generating it.

The email thread confirming this and the HMMP are found in attachment 1.

This means that it is NOT the discipline coordinator or the senior full-time faculty that is responsible for the Lecturers in the discipline. Each of us should be responsible for managing the waste we (including Lecturers) each generate in our respective classes and activities. The full-time faculty can't be imposed to take care of managing waste for the entire discipline, unless he/she volunteers to do so.

5. Curricular modifications

a. CHEM curricular proposals (by Letty Colmenares).

i. Modification of the CHEM 100/100L course title & description. The modifications for CHEM 100/100L are proposed to achieve uniformity in title and course description with all other campuses system-wide (see attachment 2). Unanimously approved.

ii. New course proposal. BIOC 141 (course outline, attachment 3) is proposed to fulfill the one-semester chemistry requirement for pre-nursing and pre-dental hygiene majors. After discussion this was unanimously approved.

ii. BIOL 171/172 curricular modification (by Dave Krupp).

i. The course descriptions, SLO’s, and the lists of course lecture topics of BIOL 171/172 will be revised. This is because some of the BIOL 171 topics will be shifted to BIOL 172 to be consistent with UHM. (see attachment 4, BIOL 171 and BIOL 172 course outlines.)

ii. Change the prerequisites and co-requisites of BIOL 172. The current pre-requisites are BIOL 171 & 171L. This will be changed to just BIOL 171. The current co-requisite, BIOL 172L, will be removed to provide more flexibility to neighbor island students enrolling in the distance learning version of this class.

During discussion, Letty pointed out that WCC’s BIOL 171 is the only one in Oahu that does not follow UHM co-requisite requirement of CHEM 161. Dave said that he will change the co- and pre-requisite requirements if course articulation with UHM is threatened.

After discussion, the BIOL 171/172 curricular proposals were unanimously approved.
6. Polynesian Voyaging (IS160/260 sequence): Should these courses be relocated under the NS department? Floyd and Joe asked that department members think about this and discuss/decide at the next department meeting.

7. Use of Imiloa Rooms. Ross spoke on behalf of Lillian Cunningham to request the use of Imiloa on Saturday, February 23, 2013 for the writers’ workshop she is hosting. It would involve one of the larger classrooms (probably Imiloa 123), atrium and a few smaller rooms for group work. No objections were raised; the request was approved.

8. GLO Assessments: Gen Ed & Information Literacy will be assessed campus-wide in spring 2013. Each discipline coordinator was requested to decide which course to assess and inform DC by email before spring convocation. A course must have a ‘3’ or a ‘2’ Info Lit designation to assess this SLO. (see attachment 5).

9. CCAAC Report. Ross Langston reported that the curricular proposals of the Vet Tech program, AG Sustainability Program and CoC in Plant Food Production & Technology were approved.

10. Other Matters. UHPA members are requested to send comments to UHPA representative Pam Dagrossa or UHPA Board director Letty Colmenares comments on proposal to disaffiliate from NEA by Jan 14, 2013. Also, please vote on the amendment of UHPA Bylaws by Jan 18, 2013.

11. Potluck BRUNCH.

The attachments are in a separate pdf file.
Minutes of Natural Science Meeting (Dec 14, 2012)

ATTACHMENT 1: HMMP Clarification (Email exchange between Letty Colmenares, Clifford Togo and Miles Nirei).

Leticia Colmenares <leticiacolmenares@gmail.com> Dec 7

to Clifford

Aloha Cliff,

Thank you very much for answering my questions in a phone conversation last Wed, Dec 5, 2012 and for providing me a copy of the most recent WCC Hazardous Waste Management Plan.

In our conversation, you said that the “instructor” referred to in the document is anybody, even a lecturer, who is teaching a course. This instructor has the responsibility to attend an annual training and to manage hazardous waste properly after generating it.

I would like to share your interpretation to the Natural Science Department in a meeting this Friday. Could you please verify and confirm this information via email?

Thank you very much!
Letty

____________________________________________________________________________________

Clifford Togo Dec 10

to me

Hi Lette,

Below is Mile Nirei's response to clarification on responsibility for handling Haz Waste. Hope it helps.

Cliff

____________________________________________________________________________________

From: Miles Nirei [mailto:nirei@hawaii.edu]
Sent: Saturday, December 08, 2012 9:34 PM
To: Clifford Togo
Subject: Re: FW: WCC Haz Waste Management Plan
Yes, it was to include all that generated hazardous waste. The lecture maybe excused, only if the responsible professor for the lecture does the training and has that person signs that they have been trained and the professor takes responsibility of what that lecture does or fails to do. Otherwise, all is responsible for attending the initial or the refresher.

Hope that clears it up. I will need to revisit the plan and make it clearer.

Miles

_____________________________________

On Fri, Dec 7, 2012 at 4:47 PM, Clifford Togo <togo@hawaii.edu> wrote:

Miles,

When you created the HMMP, the term instructor meant anyone who is teaching the course that would include lecturers as well. Is this correct? I just want to provide Lettie some info that she needs clarification.

Thanks,

Cliff

Revised 2/2010

WINDWARD COMMUNITY COLLEGE
HAZARDOUS MATERIAL AND HAZARDOUS WASTE
MANAGEMENT PROGRAM

This program description provides information on requirements for the management of hazardous materials, including the disposal of hazardous waste, at Windward Community College (WCC). These requirements are based on federal, state and county regulations. Failure to comply with these requirements may subject WCC and/or individuals to fines, and civil or criminal prosecution. In addition, the management of hazardous materials is necessary to reduce disposal costs. While the disposal of all material as hazardous waste is expensive, there are certain materials that require special attention to minimize the difficulty and expense of their disposal.

I. MANAGEMENT OF HAZARDOUS MATERIAL

Compliance with the following requirements will assist the Vice Chancellor for Administrative Services (VCAS) in ensuring the proper management of certain types of hazardous chemicals. The following personnel are designated as responsible for the implementation of this program in their areas:
1. All above personnel are required to attend the annual hazardous waste generator training.

2. Approval to Purchase Hazardous Chemicals

VCAS approval is required for the purchase or requisition of all hazardous chemicals. The Procurement Authorization for Hazardous Material Form, Attachment 1, must be completed and submitted to VCAS for approval prior to initiating a purchase order for any hazardous materials. If approved, a copy of the form will be provided to you for attachment to your purchase order or requisition. The purpose of VCAS approval is to enable us to assist you in ensuring the safe storage, handling and eventual disposal of the material while minimizing cost to WCC.

3. Approval to Use Hazardous Materials

As part of the grant approval process (ORS Form 5, item 4 under PI certification) a specific form for the use of certain hazardous materials has been developed. See Attachment 2. This form is similar to those already in place for the use of radioactive and biohazard materials.

4. Inventory Control

a. Inventory of Hazardous Chemicals

WCC programs that store hazardous materials are required to submit annual inventories to the VCAS. The annual hazardous material inventory form, Attachment 3, will help us deal with certain types of hazardous materials already on hand, monitor on-going usage, and to prevent unnecessary accumulation of hazardous materials. As part of the inventory procedure, WCC programs are required to inspect the condition of all hazardous material containers to ensure that hazardous materials are stored in containers which are in good condition and which are properly labeled.

b. Inventory of Hazardous Wastes

WCC programs that generate hazardous wastes are required to submit monthly inventories to the VCAS. Waste inventories shall be submitted to the
VCAS on or before the first Friday of every month. The hazardous waste inventory form, Attachment 4, will help us monitor campus-wide hazardous waste accumulation. As part of the inventory procedure, WCC programs are required to inspect the condition of all hazardous material containers to ensure that hazardous materials are stored in containers which are in good condition and which are properly labeled.

5. Audit Program

VCAS has established an audit program to assist in maintaining laboratories and facilities which are safe and protective of the environment. VCAS and/or the Environmental Health and Safety Office will conduct periodic random audits of laboratories and facilities to review the implementation of applicable safety, health and environmental policies and requirements. The following issues will be reviewed: hazardous material storage, hazardous and acutely hazardous waste accumulation, Material Safety Data Sheet availability, hazardous waste accumulation areas, and emergency plans. A report indicating any corrective actions that are necessary and suggesting any improvements will be provided by the VCAS.

II. HAZARDOUS WASTE IDENTIFICATION

1. Waste Identification and Classification

a. All waste streams generated throughout the WCC must be identified and then classified as hazardous or non-hazardous according to EPA and State definitions. If you need assistance in determining whether a waste is hazardous, you should contact the Environmental Health and Safety Office at UH Manoa for assistance.

b. The first step in meeting the requirement is to identify the waste streams. A waste is:

(i.) A useless by-product of an operation,
(ii.) A material which is to be disposed,
(iii.) Any material which can no longer be used,
(iv.) A manufacturing by-product.

c. All wastes must be screened to determine whether they are hazardous. A hazardous waste is one which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. The EPA has determined that the following meet the definition of a hazardous waste:
(i.) A waste which is listed as hazardous in the regulations (40 CFR 261);
(ii.) A mixture that includes a listed hazardous waste; or
(iii.) A waste which exhibits any of the four following characteristics; ignitability, corrosivity, reactivity, or toxicity.

d. The following procedures should be used to determine if a waste is hazardous. If it is, the procedures will identify the appropriate EPA hazardous waste number for each waste, which will in turn determine disposal requirements:

(i.) Determine the proper name of the waste and its specific source.
(ii.) Check the EPA’s hazardous waste lists in the following order:

(a.) “U” list of toxic wastes (40 CFR 261.33f). See Attachment 5.


(c.) “K” List of hazardous wastes from specific sources (40 CFR 261.32). See Attachment 7.

(d.) “F” List (40 CFR 261.31) for a non-specific source of waste. See Attachment 8.

(iii.) If the waste is not one the “U” List, the “P” List, the “K” List or the “F” List, you must determine whether the waste exhibits any of following four characteristics:

(a.) Ignitability. A waste that exhibits the characteristic of ignitability has the EPA hazardous waste number of D001. See 40 CFR §261.20, Attachment 9, for instructions on how to determine whether a waste exhibits the characteristic of ignitability.

(b.) Corrosivity. A waste that exhibits the characteristic of corrosivity has the EPA hazardous waste number of D002. See 40 CFR §261.22, Attachment 9, for instructions on how to determine whether a waste exhibits the characteristic of corrosivity.

(c.) Reactivity. A waste that exhibits the characteristic of reactivity has the EPA hazardous waste number of D003. See 40 CFR §261.23, Attachment 9, for instructions on how to determine whether a waste exhibits the characteristic of reactivity.

(d.) Toxicity. A waste that exhibits the characteristic of reactivity will have and the EPA hazardous waste number of D004 through D043. See 40 CFR §261.24, Attachment 9, for instructions on
how to determine whether a waste exhibits the characteristic of reactivity.

e. Most facilities produce wastes consistent in character; therefore, what is often the most confusing aspect of the regulations – characterization and classification – becomes a periodic verification function.

2. Material Safety Data Sheets

Material Safety Data Sheets (MSDSs) will help you determine whether a product is a hazardous material. MSDSs are prepared by the manufacturer, distributor or importer of products containing hazardous substances. The MSDSs provide the following detailed information about the product:

- Chemical composition
- Physical characteristics and chemical properties
- Fire, explosion and reactivity hazards
- Health hazard information and symptoms of overexposure
- Protective equipment recommendations
- Handling and storage precautions
- Cleanup and disposal procedures
- Emergency first aid procedures

All chemical manufacturers and suppliers of hazardous chemicals must furnish an MSDS with each initial shipment and furnish new MSDS information upon request.

3. Location and Accessibility of MSDSs

Copies of all MSDSs must be kept in proximity to the area where products are stored and must be readily available to all employees at any time. MSDSs must also be available for medical personnel, State and Federal occupational safety and health officials, EPA and Hawaii Department of Health personnel. It is the responsibility of the supervisor in each area to ensure that all MSDSs are kept in an accessible storage area and are updated. Employees are encouraged to refer to the MSDSs for information on products in their work area.

If an MSDS is missing or incomplete, you must fax a letter to the product manufacturer immediately, with a follow-up copy of the letter by mail.

III. HAZARDOUS WASTE DISPOSAL REQUIREMENTS

The following requirements apply to all generators of hazardous waste.

1. Waste generators must:
   a. Become familiar with the hazardous materials in their area and
with this WCC policy on hazardous material and hazardous waste management.

b. Provide an annual inventory of all hazardous materials used (Attachment 3), and monthly inventory of hazardous wastes (Attachment 4).

c. Comply with waste requirements. Store and label waste properly.

d. Contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660), if in doubt about requirements or how to properly to dispose of waste.

2. Waste Accumulation

a. Limits on Waste Generation

To retain the favorable status of being a conditionally exempt small quantity generator, and to prevent WCC from becoming subject to more stringent regulations, WCC may not generate more than 100 kilograms (approximately one half of a 55-gallon drum, 27 gallons or 220 pounds) of hazardous waste or 1 kilogram (2.2 pounds) of acute hazardous waste in one month. Acute hazardous waste is identified on the attached “P” List (40 CFR 261.33e).

b. Limits on Waste Accumulation

To retain the favorable status of being a conditionally exempt small quantity generator, and to prevent WCC from becoming subject to more stringent regulations, WCC may not have more than 1000 kilograms (approximately five 55-gallon drums, or 275 gallons, or 2200 pounds) of total accumulated hazardous waste and no more than 1 kilogram (2.2 pounds) of accumulated acute hazardous waste at any time.

c. WCC programs generating hazardous waste should establish a safe area near the point of generation for the temporary storage of that waste before disposal by a licensed contractor. The VCAS will annually, or more frequently if necessary, hire a licensed hazardous waste contractor to transport the waste to a permitted hazardous waste treatment, storage and disposal facility.

d. All hazardous waste containers must be labeled with the words “Hazardous Waste,” an accurate description of the contents of the container and marked with the accumulation start date.

e. All hazardous waste containers must remain closed except when waste is being added to them.

3. Waste Containers
Containers used for wastes must be in good condition (i.e. no rusting, cracks or structural defects). If a container is broken or begins to leak, the material must be transferred to a container in good condition. The material composition must be compatible with the material to be stored and incompatible materials must not be stored in proximity to one another. Package materials in sturdy cardboard boxes or plastic waste containers. Cushion the material in the containers to prevent breakage. If cardboard boxes are used which originally held other chemicals, the name of the chemical must be covered over or defaced. Failure to do so constitutes improper marking as to contents and is an EPA regulation violation.


Incompatible materials shall be segregated in separate boxes for quantity greater than 1/4 lb/100 grams for solids and 4 ounces/100 ml for liquids. Examples of incompatible materials are: acids/bases, organics/oxidizers, and flammable liquids/oxidizers. Unknowns and high hazard materials such as cyanides, organic peroxides, pyrophorics, water reactivexes and explosives shall be packaged separately regardless of quantity.

5. Labeling and Containment

Waste material shall be labeled with the word "waste" and the chemical name(s) (e.g., "waste methyl alcohol" or "waste ethidium bromide"). Generic names can be used if a separate list is maintained to indicate the chemical names and the approximate amounts (e.g., "waste chlorinated solvent bottle no 1" with a separate list "Bottle no. 1 Chloroform 50%, Methyl Chloroform 40%, Methylene Chloride 10"). The manufacturers label or a label giving the chemical name and specific hazards (e.g., flammable, corrosive or poison) is acceptable. Containments are not required for containers of liquid waste that is less than 55 gallons. However, a plan for handling spills must be in place. Consult with the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660a) regarding appropriate containment when a 55 gallon drum is used to collect waste.

6. Drain Disposal Prohibited

No hazardous materials may be disposed of down the drain. This specifically includes but it not limited to:

- Pollutants that create a fire or explosive hazard.
- Any liquids having a pH less than 6.0 or more than 9.0, or otherwise causing corrosive structural damage.
- Any wastewater containing in excess of the following limits:
  - 0.078 mg/l arsenic
  - 1.23 mg/l cadmium
  - 2.8 mg/l chromium
  - 3.4 mg/l copper
  - 1.2 mg/l cyanide
  - 0.68 mg/l lead
6. Emergency Plans for Spills

You must have a specific spill emergency plan and provide information and training to individuals working in your area regarding the plan. It is a good idea to post the emergency procedures and emergency phone numbers in the work area. Personnel working with hazardous chemicals should be able to answer the question: "What would I do if this material spilled?"

Spill kits with instructions, absorbents, reactants, and protective equipment should be available to clean up minor spills. A minor spill is one that does not spread rapidly, does not endanger people or property except by direct contact, does not endanger the environment, and the workers in the area are capable of handling safely without the assistance of safety and emergency personnel. All other chemical spills are considered major. The following are general procedures for the handling of spills.

a. Attend to anyone who may have been contaminated or hurt, if it can be done without endangering yourself.

b. Turn on the fume hood(s) and open windows where this can be done without endangering yourself. If flammable materials are spilled, de-energize electrical devices if it can be done without endangering yourself.

c. If the spill is major contact the Environmental Health and Safety Office at the UH Manoa Campus (808-956-8660), the Honolulu Fire Department (911), and the VCAS at 235-7405. If the spill is minor clean up can be performed as follows:

   (i.) Ensure protective apparel is resistant to the spilled material. Neutralize acids and bases, if possible using neutralizing agents such as sodium carbonate or sodium bisulfate.

   (ii.) Control the spread of liquids by containing the spill.

   (iii.) Absorb liquids by adding appropriate absorbent materials, such as vermiculite or sand, from the spill’s outer edges toward the center. Paper towels and sponges may also be used as absorbent material, but this should be done cautiously considering the character of the spilled material. If you have any questions regarding spill clean up requirements, please contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660).
(iv.) Collect and contain the cleanup residue and any materials used to clean up the spill by scooping them into a plastic bucket or other appropriate container and properly disposing of the waste as hazardous waste.

(v.) Decontaminate the area and affected equipment. Ventilating the spill area may be necessary.

(vi.) Document what happened, why, what was done, and what was learned. Such documentation can be used to avoid similar instances in the future. Major incidents are almost always preceded by numerous near misses.

7. Specific Information on the Disposal of Various Materials

The individual possessing or generating the material retains the primary responsibility for the material. The Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) provides information on requirements and assistance in handling the materials. Specific information on various types of materials is given below.

BATTERIES: Lithium, nickel/cadmium or mercury batteries shall be stored at the hazardous waste accumulation site for contract disposal. Vehicle batteries are recyclable and arrangements with local vendors can be made. Operations and Maintenance handle disposal of batteries from State vehicles.

BIOLOGICAL MATERIALS: For biohazardous wastes, refer to the published University biohazardous waste disposal guidelines or contact the EHSO Biological Safety Officer 808-956-3197 for information concerning the handling and disposal of biological materials.

COMPRESSED GASES: Compressed gas cylinders should be returned to the vendor. A return agreement with the vendor should be included in the contract. Without such an agreement the return or disposal of the cylinders is difficult and very costly, contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) for assistance.

CONTROLLED SUBSTANCES: The handling and disposal of controlled substances (i.e. drugs and other substances listed in 21 CFR 1308) are the responsibility of the permit holder.

FLUORESCENT LIGHT BALLASTS: The Operations and Maintenance Department (x444) removes non-leaking ballast. Ballast which may contain PCBs, are believed to have already been removed from WCC light fixtures. Contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) for assistance concerning leaking ballast or any ballast known to contain PCBs.

FLUORESCENT LIGHT TUBES: The Operations and Maintenance Department (x444), removes and disposes of fluorescent light tubes.
HAZARDOUS CHEMICALS AND HAZARDOUS WASTE: The VCAS will annually hire a contractor to dispose of hazardous wastes. Efforts should be made to determine if others could use excess hazardous chemicals in the department or facility prior to submitting for contract disposal. Chemicals considered non-hazardous waste (see "Non-hazardous Waste" below) could be disposed of in the municipal sanitary landfill or sanitary sewer.

MERCURY: Items containing functional mercury (e.g. light switches, barometers and thermometers) shall be stored at a hazardous waste accumulation site for contract disposal.

MIXED WASTE: Mixed waste is defined as materials that possess a radioactive or biological hazard as well as an unrelated chemical hazard (e.g. potassium dichromate solution contaminated with Carbon-14). Contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) as applicable for assistance in the proper disposal of these materials.

NON-HAZARDOUS WASTE: Listed below are typical laboratory chemicals which are not considered hazardous wastes by the U.S. Environmental Protection Agency. Chemicals with an LD$_{50}$ (oral rat) greater than 500 mg/kg are considered non-hazardous unless they are suspect carcinogens, mutagens, or teratogens. Non-hazardous waste can be disposed of in the municipal sanitary landfill if solid and down the drain if liquid. Contact the Environmental Health and Safety Office at the UH Manoa Campus (808-956-8660) if you are unfamiliar with interpreting toxicity data or cannot find LD$_{50}$ information.

a. ORGANIC CHEMICALS

Sugars and sugar alcohols
Starch
Naturally occurring alpha-amino acids and salts
Citric acid and salts: Na, K, Mg, Ca, NH$_4$
Lactic acid and salts: Na, K, Mg, Ca, NH$_4$

b. INORGANIC CHEMICALS

Sulfates: Na, K, Mg, Ca, Sr, Ba, NH$_4$
Phosphates: Na, K, Mg, Ca, Sr, NH$_4$
Carbonates: Na, K, Mg, Ca, Sr, Ba, NH$_4$
Oxides: B, Mg, Ca, Sr, Al, Si, Ti, Mn, Fe, Co, Cu, Zn
Chlorides: Na, K, Mg
Fluorides: Ca
Borates: Na, K, Mg, Ca
Alum
Alumina
Silica gel
OILS AND TRANSFORMER FLUID: VCAS will assist with disposal of waste pump oil. Used motor oil is recyclable through local vendors. Operations and Maintenance handle used motor oil from University vehicles. Transformer fluid will be handled on a case by case basis, contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) for assistance. The following requirements apply to used oil:

- Used oil may only be stored in containers that are in good condition and not leaking.
- Containers, aboveground storage tanks, and fill pipes must be labeled or marked clearly with the words “used oil.”
- Upon detection of a release of used oil, a generator must stop the release, contain the used oil, clean up and manage properly the used oil and other materials, and if necessary, repair or replace any leaking used oil storage containers. If a release of used oil occurs, contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) for information regarding cleanup, and special government reporting requirements which may apply.

PAINT WASTE (Autobody): Paint waste generated by the Autobody Program will be stored in a marked container labeled, “Paint Waste for Recycling”. On a regular basis, the paint waste will be processed through the paint solvent recycler. After recycling, the remaining paint sludge will be carefully dried out and can be disposed in the municipal sanitary landfill. Thinner solvent extract can be used as product.

PHOTOGRAPHIC CHEMICALS: Photographic fixer will must be stored in capped container and labeled, “Fixer for Recycling”. On a regular basis, the fixer will be transported to a local photographer who will process it for silver recovery.

RADIOACTIVE MATERIALS: Refer to the University Radiation Safety Manual or contact the UH Manoa campus (808-956-8660) for information concerning the proper handling and disposal of radioactive material.

SHARPS AND GLASSWARE: Glassware not contaminated with radiological, biological or hazardous chemical material shall be placed in a puncture resistant container labeled "glass" or "broken glass". It will be picked up by the Operations and Maintenance staff and disposed of. Refer to the published University biohazardous waste disposal guidelines or contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) for information on the handling and disposal of sharps or glassware contaminated with biological or infectious material. Refer to the University Radiation Safety Manual or contact the Environmental Health and Safety Office at the UH Manoa campus (808-956-8660) for information on the proper handling and disposal of sharps or glassware contaminated with radioactive material. Glassware or sharps contaminated with hazardous chemicals should be rinsed to decontaminate them and then disposed of as non-contaminated glassware or sharps (i.e. placed in a sharps container). Broken glassware contaminated with hazardous chemicals should be placed in a
puncture resistant container (e.g. bottle, plastic container or can overpack), labeled with the name of the chemical and disposed of as hazardous chemical waste.

N. HAZARDOUS WASTE MINIMIZATION

1. Buying Chemicals in Smaller Amounts

The "large economy size" may cost less to buy, but disposal costs, in most cases, are several times the initial cost of the material. Many of the bottles of excess or waste chemicals returned for disposal are full or 3/4 full. Everyone needs to try to accurately estimate the amount of a chemical they expect to use.

2. Recycling and Redistribution

Efforts should be made to find someone in the laboratory or department who can use the hazardous material before it is submitted to the VCAS as waste for contract disposal.

3. Use of Less Hazardous or Non-hazardous Materials

The following provides some examples of the use of less hazardous or non-hazardous materials, everyone is encouraged to think of some others which may be applicable to their research or instructional materials.

Cleaning Solutions: Chromerge, chromic acid and dichromate cleaning solutions are not desirable from a waste disposal prospective as they cannot be made non-hazardous and are expensive to dispose of. There are many non-toxic biodegradable cleaning solutions that can be used instead of chromic acid. For extremely dirty glassware a product called Nochromix, which uses sulfuric acid and an organic oxidizer in place of chromium can be used. While this requires neutralization of the acid for ordinary disposal, it is far less costly to dispose of than chromium solutions. A number of alternative cleaning solutions are listed below. These are all available from Fisher Scientific, who has the University contract for laboratory supplies. NoChromix, Alconox, Liquinox liquid detergent, Citranox, Fisherbrand sparkleen, and FL-70 Concentrate.

Drying Agents: The safest common drying agents are calcium chloride, silica gel, molecular sieves and calcium sulfate (Drierite). These are recommended because of their low toxicity and stability. Drying agents that pose varying degrees of hazard and disposal problems include:

Phosphorus pentoxide, which generates highly corrosive phosphoric acid and heat on contact with water. This material also has to be disposed of as a hazardous.
Magnesium perchlorate (Dehydrite), which is a strong oxidizer and may cause fires or explosions on contact with organic materials. This material has to be disposed of as a hazardous waste.

Water Reactive Chemicals, (materials such as sodium metal, potassium metal, calcium metal, calcium carbide, calcium hydride, lithium hydride, lithium aluminum hydride, sodium hydride and potassium hydride) are not recommended for use as general purpose drying agents because they form flammable gases on contact with water and are both dangerous and expensive to dispose of. Small amounts of these materials, can be safely disposed of by reacting them with water under controlled conditions by knowledgeable personnel to create non-hazardous or less hazardous materials. If a bottle of solvent contains a water reactive drying agent, this information must be clearly marked on the bottle. This is necessary for the safety of personnel handling the material during disposal.

Thermometers: Mercury thermometers should be replaced with non-mercury thermometers whenever possible. Broken mercury thermometers create spills which are a potential health hazard, time consuming to clean up, and one of the most expensive hazardous wastes we handle. Non mercury thermometers with equivalent accuracy are available for temperature ranges of -20 to 250 degrees Centigrade. Check your laboratory supply catalog for more information.

4. Conversion to non-hazardous material

As part of instruction or research operations, hazardous materials can be converted into non-hazardous wastes. The neutralization of acids or bases is an example of this. Experiments can be designed to convert residual or produced hazardous materials into non-hazardous wastes. In some cases this can have instructional value as well as reducing the amount of hazardous waste and its disposal cost.
**ATTACHMENT 2: CHEM 100/100L Curricular Modification**

Chem 100: Change in course title and description

Justification: To have uniform title/description per agreement in a system-wide meeting among Chem 100 instructors on Nov 29, 2012.

<table>
<thead>
<tr>
<th>CURRENT Chem 100</th>
<th>PROPOSED NEW Chem 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Title: Chemistry in Society</td>
<td><strong>New Title: Chemistry and Society</strong></td>
</tr>
<tr>
<td>Old Description: Chemistry 100 provides a survey of basic concepts and applications of chemistry in the real world. This course is suitable for students who had little or no background in chemistry and serves to fulfill a general education physical science core course for the non-science major or as a preparatory course for Chem 151.</td>
<td><strong>New Description:</strong> Introduction to chemistry for non-science majors. Discussion of basic chemistry concepts and their application to everyday life. This course is suitable for students who had little or no background in chemistry and serves to fulfill a general education physical science core course for the non-science major or as a preparatory course for Chem 151 or BIOC 141.</td>
</tr>
</tbody>
</table>

Chem 100L: Change the title

Justification: To have uniform title per agreement in a system-wide meeting among Chem 100 instructors on Nov 29, 2012.

<table>
<thead>
<tr>
<th>CURRENT Chem 100L</th>
<th>PROPOSED NEW Chem 100L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Title: Chemistry in Society Laboratory</td>
<td><strong>New Title: Chemistry and Society Laboratory</strong></td>
</tr>
</tbody>
</table>
ATTACHMENT 3: BIOC 141 (Fundamentals of Biochemistry) Course Outline

BIOS 141 Fundamentals of Biochemistry
3 credits, CRN ######

INSTRUCTOR: Instructor
OFFICE: Imiloa ###
E-MAIL: instructor@hawaii.edu
OFFICE HOURS: MW ##:##-##:## am, TR ##:##-##:## (online)
TELEPHONE: 236-xxxx
EFFECTIVE DATE: Fall 2013

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

Biological chemistry focusing on the integration of concepts from general, inorganic, and biochemistry and their application to living systems. Satisfies the one-semester chemistry requirement for pre-nursing and pre-dental hygiene majors.
Prerequisites: A grade of ‘C’ or better in MATH 25 or instructor's consent.
WCC: DP

STUDENT LEARNING OUTCOMES

1. Utilize precise chemical language to effectively communicate biochemical and allied health-related concepts and results.

2. Analyze and apply appropriate procedures for solving biochemical and allied health-related calculations involving solids, liquids, gases, and solutions.

3. Relate the location of an element in the periodic table to its electronic structure and chemical reactivity.

4. Describe ionic and covalent bonding theories and apply them to the construction of proper Lewis structures and prediction of molecular characteristics.

5. Relate biochemical and allied health-related concepts, theories and laws to everyday phenomena.
COURSE TASKS

- Quizzes
- Assignments
- Discussion Forum
- Reflection Paper
- Two Midterm Exams
- Final Exam

GRADING

Grades will be based on the following:

- Quizzes (15)------------------ 150 points
- Assignments (15)------------- 150 points
- Discussion Forum (10)-------- 50 points
- Exam 1----------------------- 100 points
- Exam 2----------------------- 100 points
- Final Exam------------------- 150 points
- Reflection Paper-------------- 100 points

800 points total

Course grades will be assigned as follows:

A  720-800 points  90-100%
B  640-719 points  80-89%
C  560-639 points  70-79%
D  480-559 points  60-69%
F  479 points or below 59% or below

N Grade: The 'N' grade indicates that the student has worked conscientiously, attended regularly, finished all work, fulfilled course responsibilities, and has made measurable progress but has not achieved the minimal student learning objectives and is not yet prepared to succeed at the next level. Or, the student has made consistent progress in the class but is unable to complete the class due to extenuating circumstances, such as major health, personal or family emergencies. Students requesting for N grade must provide a formal letter of request before the final examination with supporting evidences.

The other grades I, W, Cr, NC to be assigned are described in the current college catalog.

LEARNING RESOURCES

Textbook: "General, Organic and Biological Chemistry” 2nd Edition by J.G. Smith
Custom edition for Windward CC; Publisher McGraw-Hill (required)
The custom edition includes the Student Study Guide/Solutions Manual
An electronic version is also available for purchase from McGraw-Hill

Course Website: http://laulima.hawaii.edu (use UH email account login and password)
Other Materials: Scientific calculator (required)
COURSE POLICIES

1. Please use the Course Schedule and Study Guides throughout the semester. They contain the topics, reading requirements, due dates and learning objectives for the course.

2. Focus on the objectives of each chapter. Read the lecture outlines and textbook with the objectives in mind.

3. In addition to the textbook and lecture outlines, multimedia materials are used to deliver course content in the course website.

4. Have a notebook. Take notes during lecture and discussion.

5. Always feel free to ask questions!


7. See your instructor for consultation.

8. You should plan to spend at least 6 hours per week outside of lectures on this course.

9. There will be weekly quizzes.

10. Make-up or retaking quizzes will NOT be allowed.

11. Weekly Assignments. There are a total of fifteen assignments (one due approximately each week) worth ten points each.

12. Each midterm exam will cover approximately 33% of the course material. The final exam will be cumulative covering ALL topics taken throughout the semester. Check the course schedule for examination dates.

13. The midterm and final exams are closed books and notes.

14. The reflection paper is worth 100 points and should contain at least 800 words. Your goal is to reflect upon the knowledge and skills you’ve gained throughout the course and how this will help you in your chosen field of study. You may discuss more than content knowledge; improving process skills such as critical thinking, teamwork, communication, etc. is just as valuable. Relating course material to experiences in your own life would be excellent but is not required. For full credit, describe 4-5 specific topics that we covered. No late papers will be accepted. You are encouraged to use the Writing Center for help. Your grade will be based on the following rubric:
Written communication (50 points)

Organization
• Professional quality (21-25 points): Can be easily followed.
• Good quality (16-20 points): Can be followed.
• Satisfactory quality (11-15 points): Difficult to follow.
• Inadequate quality (0-10 points): No organization of the paper’s contents.

Mechanics and grammar
• Professional quality (21-25 points): Clear, concise and contains no grammatical errors.
• Good quality (16-20 points): Contains minimal grammatical errors.
• Satisfactory quality (11-15 points): Contains numerous grammatical errors.
• Inadequate quality (0-10 points): Difficult to read and understand due to poor grammar.

Content (50 points)

Correctness of facts
• Professional quality (21-25 points): Technical explanation is both concise and complete.
• Good quality (16-20 points): Technical details are generally correct.
• Satisfactory quality (11-15 points): Some facts are wrong.
• Inadequate quality (0-10 points): Most facts are wrong.

Completeness
• Professional quality (21-25 points): Thoughtful reflection and full of detail.
• Good quality (16-20 points): Thoughtful reflection but left out some details.
• Satisfactory quality (11-15 points): Some reflection but provided few details.
• Inadequate quality (0-10 points): Total lack of reflection and/or detail.

DISABILITIES ACCOMMODATION

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 (and instructor) to discuss reasonable accommodations that will help you to succeed in this class. Ann Lemke can be reached at 235-7448 or lemke@hawaii.edu or you may stop by Hale 'Akoakoa 213 for more information.
<table>
<thead>
<tr>
<th>Module</th>
<th>Chapters</th>
<th>Topics Covered</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chp 1</td>
<td>Course Overview, States of Matter, Physical and Chemical Properties &amp; Changes, Matter Classification, The Metric system, Measurement, Significant Figures</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>2</td>
<td>Chp 1</td>
<td>Scientific Notation, Dimensional Analysis, Dosage Calculations, Temperature scales and conversion, Density</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>3</td>
<td>Chp 2</td>
<td>Classes of Elements, Atomic Structure, Mass/Atomic Number, Isotopes, The Periodic Table, Periodic Trends, Electronic Structure</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>4</td>
<td>Chp 2/3</td>
<td>Electron Configuration, Orbital Diagrams, Noble Gas Notation, Valence Electrons, ionic Bonding, Cations, Anions, Octet Rule, Ionic Charges</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>5</td>
<td>Chp 3</td>
<td>Writing Chemical Formulas, Naming Ionic Compounds, Variable Charge Cations, Polyatomic Ions, Expansion of Naming and Formula Writing</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>6</td>
<td>Chp 1-3</td>
<td><strong>Exam One</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Chp 4</td>
<td>Covalent Bonding, Key Bonding Patterns, Drawing Lewis Structures, Octet Rule Exceptions, Naming Covalent Compounds, Determining Molecular Shape</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>8</td>
<td>Chp 4/5</td>
<td>Electronegativity, Bond Dipoles, Molecular Polarity, Balancing Chemical Equations, The Mole, Moles to Molecules Conversion, Avogadro's</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>9</td>
<td>Chp 5</td>
<td>Formula Weight, Molar Mass, Grams-to-Mole, Mole-to-Mole, and Grams-to-Grams Conversion</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>Week</td>
<td>Chapter(s)</td>
<td>Topics</td>
<td>Assignments</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
<td>----------------------------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>10</td>
<td>Chp 5/6</td>
<td>Five Classes of Chemical Reactions, Nutritional Energy Calculations, Energy Diagrams, Reaction Rates</td>
<td>Quiz &amp; Assignment</td>
</tr>
<tr>
<td>12</td>
<td>Chp 4-6</td>
<td><strong>Exam Two</strong></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Chp 7</td>
<td>States/Properties of Matter, Pressure, Boyle's Law, Charles' Law, Gay-Lussac's Law, Combined Gas Law, Avogadro's Law, Ideal Gas Law,</td>
<td>Quiz Assignment</td>
</tr>
<tr>
<td>14</td>
<td>Chp 7/8</td>
<td>Intermolecular Forces, Effects on Boiling and Melting Points, Phase Changes, Solutions, Solubility, Temperature and Pressure Effects, Concentration, % w/v, % v/v,</td>
<td>Quiz</td>
</tr>
<tr>
<td>15</td>
<td>Chp 8</td>
<td>Molarity, Molarity Calculations, Dilution Calculations, Colligative Properties, Osmosis, Iso/Hypo/Hypertonic Solutions</td>
<td>Quiz</td>
</tr>
<tr>
<td>16</td>
<td>Chp 9</td>
<td>Acid/Base Definitions, pH Calculations, Buffers, Human Acid/Base Buffer System, Respiratory Acidosis/Alkalosis</td>
<td>Quiz Submit Reflection Paper</td>
</tr>
<tr>
<td>17</td>
<td>Chp 1-9</td>
<td><strong>Final Exam</strong></td>
<td></td>
</tr>
</tbody>
</table>

**ATTACHMENT 4: BIOL 171 & BIOL 172 Course Outlines**
WINWARD 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

First semester of introductory biology for all life science majors. Topics include: Overview of the science of biology; Cell structure, chemistry, growth, and reproduction; Classical, chromosomal and molecular genetics; Evolution, phylogeny and systematics; and Biology and diversity of viruses and bacteria. (3 hrs. lect.)

RECOMMENDED PREPARATION

• High school chemistry or CHEM 151
• Concurrent enrollment in BIOL 171L
• Concurrent enrollment in CHEM 161

STUDENT LEARNING OUTCOMES

By the end of this class, the student should be able to

• Develop and evaluate a scientific hypothesis.
• Describe cell structure and function.
• Describe how genetic characteristics are past from generation to generation and how they are manifested into the characteristics of the whole organism.
• Explain how the process of biological evolution influenced the history of life on our planet.
• Classify living things into a hierarchical system of groups based upon morphology, genetics, and phylogeny.
• Describe the characteristics, systematics, and biology of viruses and bacteria.

COURSE LECTURE TOPICS

• Science as a Way of Knowing
• The Characteristics of Living Things
• The Chemistry of Life: Atoms and Molecules
• The Chemistry of Life: Properties of Water
• The Chemistry of Life: Biological Molecules
• Cell Structure and Function
• Membrane Transport Processes
• Energy and Life
• Cellular Respiration
• Photosynthesis
• Plant Adaptations to Arid Environments
• Cell Communication
• Reproduction of Cells: The Cell Cycle
• Reproduction of Cells: Mitosis and Cytokinesis
• Meiosis and Sexual Life Cycles
• Classical Mendelian Genetics
• Beyond Mendel (multiple allelic inheritance, polygenic inheritance, pleiotropy, epistasis, co-dominance, incomplete dominance, linkage and crossing over, genomic imprinting, cytoplasmic inheritance, chromosomal aberrations)
• The Molecular Basis for Inheritance
• Control of Gene Expression
• Regulation of Gene Expression During Embryonic Development
• The Molecular Genetics of Viruses
• Introduction to Biotechnology
• Darwin’s Evolutionary Paradigm
• Microevolution: The Evolution of Populations
• The Origin of Species
• Macroevolution
• The History of Life
• Classification and Systematics
• Prokaryotes

MODE OF INSTRUCTION

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

• Lecture presentations and demonstrations (these may be televised or viewed as downloadable podcasts from the course Laulima site or through the University of Hawai‘i’s Video-On-Demand option).
• Internet-assisted activities and resources (e.g., Laulima and course website).
• Readings from textbook and instructor's lecture outlines and study guides (lecture outlines and study guides downloadable as pdf files from the course Laulima site).

COURSE TASKS, ASSESSMENT AND GRADING

QUIZZES. The student will take a minimum of ten quizzes (15 points each; 150 points total) administered through the Internet (Laulima) during specified time periods (but not during class sessions). 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, (there may be 12-14 quizzes in all) 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, the quizzes will be timed, the student having only 20 minutes to complete each quiz. In general, a quiz will be available for about a week (but the duration of availability period may vary from quiz to quiz). Students should expect to take at least one quiz per week. But sometimes more than one quiz will be posted at the same time. No make-up quizzes for missed quizzes will be administered for ANY REASON, including illness or family emergency (the student will receive no score for missed quizzes). Quizzes missed or receiving zeros or low scores because of computer and/or Internet problems may not be made up either. The student should also note that quizzes are only reviewable from the course Laulima site if the student has taken them. The student should not expect to be able to review quizzes that the student has not accessed from the course Laulima site during the quiz availability period.

**EXAMINATIONS.** The student will take two non-cumulative midterm examinations (100 points each) and a cumulative final examination (150 points) to demonstrate understanding of information presented primarily during lectures. The first midterm examination will cover information presented during the first third of the course. The second midterm examination will cover information presented during the second third of the course. Two thirds of the final examination will emphasize the final third of the course, while one third of the final will draw on information covered during the first and second thirds of the course. The closed-book, proctored examinations will be administered through the Internet using Laulima at your campus’ Learning/Testing Center. NO RETESTS will be given. A student missing an exam because of a documented illness or emergency may be allowed to take a make-up exam. In such a circumstance, the student should make every reasonable attempt to contact the instructor before the exam is administered to the class (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></th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>150</td>
</tr>
<tr>
<td>Midterm Examinations</td>
<td>200</td>
</tr>
<tr>
<td>Final Examination</td>
<td>150</td>
</tr>
<tr>
<td>TOTAL</td>
<td>500</td>
</tr>
</tbody>
</table>

Letter grades will be assigned as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% or above in total points.</td>
</tr>
<tr>
<td>B</td>
<td>80-89.9% of total points.</td>
</tr>
<tr>
<td>C</td>
<td>65-79.9% of total points.</td>
</tr>
<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>
</tbody>
</table>
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 "I" to the contingency grade identified by the instructor (see catalog).

<table>
<thead>
<tr>
<th>CR</th>
<th>65% or above in total points; the student must indicate the intent to take the course as <strong>CR/NC</strong> in writing by the end of the 10th week of classes (see catalog).</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC</td>
<td>Below 65% of total points; this grade only available under the <strong>CR/NC</strong> option (see above and see catalog).</td>
</tr>
</tbody>
</table>

**N** NOT GIVEN BY THIS INSTRUCTOR 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 "F" grade.

W Official withdrawal from the course after the third week and prior to the end of the 10th week of classes (see catalog).

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*


*Additional Resources*

Lecture outlines, PowerPoint slides (as pdf files), Podcasts of the lectures and other resources may be made available at the course website and/or the course Laulima site.

**STUDENT RESPONSIBILITIES**

The student is expected to attend and actively participate in all course lectures and activities, and complete all 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 lecture outlines) 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 or on the course Laulima site. It is the student’s responsibility to be informed of these changes. Students should visit the course Laulima site at least twice per week.

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).

The student should understand that "INTRODUCTORY" DOES NOT MEAN "EASY". Students should expect a level of difficulty comparable to other 100-level science classes intended for majors in the discipline. 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 W.C.C. 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 BIOL 171, 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.

While the student will have lecture outlines (downloadable from the course Laulima site), the student will not succeed in this class without taking careful lecture notes and reading the corresponding material in the textbook. The lecture outlines are not to be used in place of the student’s own note taking. 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 lecture outlines and textbook. The student should carefully review these rewritten lecture notes as often as possible. In addition to reviewing these notes before an exam, it would be useful for the student to try to rewrite these notes from memory.

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). On one side of the card, write the word. On the other side, write the appropriate biological science definition for the word. 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 the lecture outlines 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.

---

**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._
BIOL 172 General Biology II
03 Credits

INSTRUCTOR:  
OFFICE:  
OFFICE HOURS:  
TELEPHONE:  
EMAIL:  
EFFECTIVE DATE:  Fall 2013  
COURSE WEBSITE:  LAULIMA  
LAULIMA URL:  https://laulima.hawaii.edu/portal

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

Continuation of BIOL 171. Topics include: Origin of eukaryotic organisms, their general characteristics, life cycles, systematics and evolution; Anatomy, physiology and classification of higher plants; Anatomy, physiology, behavior and classification of animals; and Basic ecological principles. (3 hrs. lect.)

PREREQUISITE

• Credit in BIOL 171

RECOMMENDED PREPARATION

• Concurrent registration in BIOL 172L  
• Credit or concurrent registration in CHEM 162

STUDENT LEARNING OUTCOMES

By the end of this class, the student should be able to

• Contrast the general characteristics, life cycles, evolution and systematics of eukaryotic organisms.
• Describe the detailed biology of higher plants.
• Describe the detailed biology of animals.
• Explain how interacting environmental factors (physical, chemical and biological) determine the distribution and abundance of living things.

COURSE LECTURE TOPICS

• The Diversity of Life: Protists  
• The Diversity of Life: Fungi
• The Diversity of Life: Primitive Terrestrial Plants
• The Diversity of Life: Seed Plants
• Animal Body Plans
• The Diversity of Life: Invertebrate Animals
• The Diversity of Life: Craniates
• Plant Cell Types
• Plant Structure and Growth
• Plant Transport Processes
• Plant Nutrition
• Plant Reproduction: Development and Growth
• Plant Responses to Internal and External Signals
• Introduction to Animal Architecture and Function
• Thermoregulation
• Feeding, Digestion, and Nutrition in Animals
• Animal Circulation
• Gas Exchange in Animals
• Osmoregulation and Excretion
• The Nervous System: Transmission of Nerve Impulses
• The Nervous System: Anatomy and Function
• The Sense Organs
• Muscular Systems
• The Endocrine System
• Body Defenses and Immunity
• Animal Reproduction
• Animal Development
• Animal Behavior
• Ecological Principles: Abiotic Factors and Biomes
• Ecological Principles: Population Ecology
• Ecological Principles: Community Ecology
• Ecological Principles: Ecosystems
• Human Impacts on the Environment

**MODE OF INSTRUCTION**

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

• Lecture presentations and demonstrations (these may be televised or viewed as downloadable podcasts from the course Laulima site or through the University of Hawai‘i’s Video-On-Demand option).
• Internet-assisted activities and resources (e.g., Laulima and course website).
• Readings from textbook and instructor's lecture outlines and study guides (lecture outlines and study guides downloadable as pdf files from the course Laulima site).

**COURSE TASKS, ASSESSMENT AND GRADING**

**QUIZZES.** The student will take a minimum of ten quizzes (15 points each; 150 points total)
administered through the Internet (Laulima) during specified time periods (but not during class sessions). 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, the quizzes will be timed, the student having only 20 minutes to complete each quiz. 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). The student should also note that quizzes are only reviewable from the course Laulima site if the student has taken them. The student should not expect to be able to review quizzes that the student has not accessed from the course Laulima site during the quiz availability period.

EXAMINATIONS. The student will take two non-cumulative midterm examinations (100 points each) and a cumulative final examination (150 points) to demonstrate understanding of information presented primarily during lectures. The first midterm examination will cover information presented during the first third of the course. The second midterm examination will cover information presented during the second third of the course. Two thirds of the final examination will emphasize the final third of the course, while one third of the final will draw on information covered during the first and second thirds of the course. The closed-book, proctored examinations will be administered through the Internet using Laulima at your campus’ Learning Center. NO RETESTS will be given. A student missing an exam because of a documented illness or emergency may be allowed to take a make-up exam. In such a circumstance, the student should make every reasonable attempt to contact the instructor before the exam is administered to the class (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>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>150</td>
</tr>
<tr>
<td>Midterm Examinations</td>
<td>200</td>
</tr>
<tr>
<td>Final Examination</td>
<td>150</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>

*Letter grades will be assigned as follows:*

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% or above in total points.</td>
</tr>
<tr>
<td>B</td>
<td>80-89.9% of total points.</td>
</tr>
<tr>
<td>C</td>
<td>65-79.9% of total points.</td>
</tr>
<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 <strong>INSTRUCTOR'S OPTION</strong> when student is unable to complete a small part of the course because of circumstances beyond his or her control. It is the <strong>STUDENT'S</strong> 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 <strong>CR/NC</strong> 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 <strong>CR/NC</strong> option (see above and see catalog).</td>
</tr>
<tr>
<td>N</td>
<td><strong>NOT GIVEN BY THIS INSTRUCTOR EXCEPT UNDER EXTREMELY RARE CIRCUMSTANCES</strong> (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>
</tr>
</tbody>
</table>

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


Additional Resources

Lecture outlines & study guides, PowerPoint slides (as pdf files), podcasts of the lectures and other resources may be made available at the course website and/or the course Laulima site.

STUDENT RESPONSIBILITIES

The student is expected to attend and actively participate in all course lectures and activities, and complete all 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 lecture outlines) 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 or on the course Laulima site (Laulima Announcements Page for BIOL 172). It is the student's responsibility to be informed of these changes. Students should visit the course Laulima site at least twice per week.

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).

The student should understand that "INTRODUCTORY" DOES NOT MEAN "EASY". Students should expect a level of difficulty comparable to other 100-level science classes intended for majors in the discipline. 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 W.C.C. 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 BIOL 172, 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.
While the student will have lecture outlines (downloadable from the Laulima site), the student will not succeed in this class without taking careful lecture notes and reading the corresponding material in the textbook. The lecture outlines are not to be used in place of the student’s own note taking. 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 lecture outlines and textbook. The student should carefully review these rewritten lecture notes as often as possible. In addition to reviewing these notes before an exam, it would be useful for the student to try to rewrite these notes from memory.

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). On one side of the card, write the word. On the other side, write the appropriate biological science definition for the word. 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 the lecture outlines 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.

**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 ‘Ākoakoa 213 for more information.
## ATTACHMENT 5: INFO LIT Designation

<table>
<thead>
<tr>
<th>D. Ringuette</th>
<th>INFO Lit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 017</td>
<td>Home Gardening</td>
</tr>
<tr>
<td>AG 020</td>
<td>Plant Science</td>
</tr>
<tr>
<td>AG 022</td>
<td>Soils Technology</td>
</tr>
<tr>
<td>AG 030</td>
<td>Agricultural Business Management</td>
</tr>
<tr>
<td>AG 032B</td>
<td>Plant Disease and Pest Control</td>
</tr>
<tr>
<td>AG 032C</td>
<td>Plant Disease and Pest Control</td>
</tr>
<tr>
<td>AG 032D</td>
<td>Plant Disease and Pest Control</td>
</tr>
<tr>
<td>AG 036</td>
<td>Pesticide Safety</td>
</tr>
<tr>
<td>AG 040</td>
<td>Turfgrass Equipment</td>
</tr>
<tr>
<td>AG 044</td>
<td>Landscape Equipment</td>
</tr>
<tr>
<td>AG 045</td>
<td>Irrigation Principles and Design</td>
</tr>
<tr>
<td>AG 049</td>
<td>Plant Propagation</td>
</tr>
<tr>
<td>AG 052</td>
<td>Orchid Culture</td>
</tr>
<tr>
<td>AG 080</td>
<td>Landscape Maintenance</td>
</tr>
<tr>
<td>AG 082</td>
<td>Turfgrass Management</td>
</tr>
<tr>
<td>AG 092V</td>
<td>Special Topics</td>
</tr>
<tr>
<td>AG 093V</td>
<td>Cooperative Education</td>
</tr>
<tr>
<td>AG 100</td>
<td>Agriculture Orientation: Careers</td>
</tr>
<tr>
<td>AG 120</td>
<td>Plant Science</td>
</tr>
<tr>
<td>AG 132</td>
<td>Plant Disease and Pest Control</td>
</tr>
<tr>
<td>AG 149</td>
<td>Plant Propagation</td>
</tr>
<tr>
<td>AG 152</td>
<td>Orchid Culture</td>
</tr>
<tr>
<td>AG 155</td>
<td>Subtropical Arboriculture</td>
</tr>
<tr>
<td>AG 156</td>
<td>Tree Risk Assessment</td>
</tr>
<tr>
<td>AG 158</td>
<td>Tree Pruning and Felling Equipment</td>
</tr>
<tr>
<td>AG 159</td>
<td>Tree Climbing</td>
</tr>
<tr>
<td>AG 180</td>
<td>Landscape Maintenance</td>
</tr>
<tr>
<td>AG 182</td>
<td>Turfgrass Management</td>
</tr>
<tr>
<td>AG 235</td>
<td>Irrigation Principles and Design</td>
</tr>
</tbody>
</table>

### John/Sam

<table>
<thead>
<tr>
<th>ANSC 141</th>
<th>Introduction to Veterinary Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC 152</td>
<td>Companion Animal Diseases and Nutrition</td>
</tr>
<tr>
<td>ANSC 152L</td>
<td>Companion Animal Nursing</td>
</tr>
<tr>
<td>ANSC 190</td>
<td>Veterinary Assisting Internship</td>
</tr>
<tr>
<td>ANSC 251</td>
<td>Applied Pharmacology for Veterinary Technicians</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>ANSC 252</td>
<td>Diagnostic Imaging for Veterinary Technicians</td>
</tr>
<tr>
<td>ANSC 262</td>
<td>Clinical Procedures for Large Animals</td>
</tr>
<tr>
<td>ANSC 263</td>
<td>Laboratory Animal Procedures</td>
</tr>
<tr>
<td>ANSC151</td>
<td>Animal Science</td>
</tr>
<tr>
<td>ANSC151L</td>
<td>Animal Science</td>
</tr>
<tr>
<td><strong>Dave K.</strong></td>
<td></td>
</tr>
<tr>
<td>BIOL 100</td>
<td>Human Biology</td>
</tr>
<tr>
<td>BIOL 100L</td>
<td>Human Biology Laboratory</td>
</tr>
<tr>
<td>BIOI 101</td>
<td>Biology and Society</td>
</tr>
<tr>
<td>BIOL 124</td>
<td>Environment and Ecology</td>
</tr>
<tr>
<td>BIOL 124L</td>
<td>Environment and Ecology Laboratory</td>
</tr>
<tr>
<td>BIOL 171</td>
<td>General Biology 1</td>
</tr>
<tr>
<td>BIOL 171L</td>
<td>General Biology Lab</td>
</tr>
<tr>
<td>BIOL 172</td>
<td>General Biology 2</td>
</tr>
<tr>
<td>BIOL 172L</td>
<td>General Biology Lab 2</td>
</tr>
<tr>
<td>BIOL 200</td>
<td>Coral Reefs</td>
</tr>
<tr>
<td>BIOL 200L</td>
<td>Coral Reef Laboratory and Field Studies</td>
</tr>
<tr>
<td>BIOL 265</td>
<td>Ecology and Evolutionary Biology</td>
</tr>
<tr>
<td>BIOL 265L</td>
<td>Ecology and Evolutionary Biology Lab</td>
</tr>
<tr>
<td>AQUA 106</td>
<td>Small Scale Aquaculture</td>
</tr>
<tr>
<td>AQUA 106L</td>
<td>Small Scale Aquaculture Laboratory</td>
</tr>
<tr>
<td>AQUA 201</td>
<td>The Hawaii Fishpond</td>
</tr>
<tr>
<td>AQUA 201L</td>
<td>The Hawaii Fishpond Lab</td>
</tr>
<tr>
<td>FSHN 185</td>
<td>Human Nutrition</td>
</tr>
<tr>
<td>ZOOL 254</td>
<td>Wellness and Fitness</td>
</tr>
<tr>
<td><strong>Joe Ciotti</strong></td>
<td></td>
</tr>
<tr>
<td>ASTR 110</td>
<td>Introduction to Astronomy</td>
</tr>
<tr>
<td>ASTR 110L</td>
<td>Introduction to Astronomy Laboratory</td>
</tr>
<tr>
<td>ASTR 130</td>
<td>Archaeoastronomy</td>
</tr>
<tr>
<td>ASTR 180</td>
<td>Planetary Astronomy</td>
</tr>
<tr>
<td>ASTR 181</td>
<td>Stellar Astronomy</td>
</tr>
<tr>
<td>ASTR 250</td>
<td>Observational Astronomy</td>
</tr>
<tr>
<td>ASTR 250L</td>
<td>Observational Astronomy Lab</td>
</tr>
<tr>
<td>ASTR 281</td>
<td>Space Explorations</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>ASTR 294V</td>
<td>Special Topics in Astronomy</td>
</tr>
<tr>
<td>PHYS 122</td>
<td>Introduction to Physical Science</td>
</tr>
<tr>
<td>PHYS 122L</td>
<td>Introduction to Science To Physical</td>
</tr>
<tr>
<td>PHYS 151</td>
<td>College Physics 1</td>
</tr>
<tr>
<td>PHYS 151L</td>
<td>College Physics Laboratory</td>
</tr>
<tr>
<td>PHYS 152</td>
<td>College Physics 2</td>
</tr>
<tr>
<td>PHYS 152L</td>
<td>College Physics Laboratory</td>
</tr>
<tr>
<td>PHYS 170</td>
<td>General Physics 1</td>
</tr>
<tr>
<td>PHYS 170L</td>
<td>General Physics Laboratory 1</td>
</tr>
<tr>
<td>PHYS 272</td>
<td>General Physics 2</td>
</tr>
<tr>
<td>PHYS 272L</td>
<td>General Physics Laboratory 2</td>
</tr>
<tr>
<td>ZOOL 101</td>
<td>Principles of Zoology</td>
</tr>
<tr>
<td>ZOOL 105</td>
<td>Hawaiian Use of Fish and Aquatic Invertebrates</td>
</tr>
<tr>
<td>ZOOL 106</td>
<td>Hawaiian Marine Invertebrates</td>
</tr>
<tr>
<td>ZOOL 107</td>
<td>Identification of Hawaiian Fishes</td>
</tr>
<tr>
<td>ZOOL 141</td>
<td>Human Anatomy and Physiology 1</td>
</tr>
<tr>
<td>ZOOL 141L</td>
<td>Laboratory 1</td>
</tr>
<tr>
<td>ZOOL 142</td>
<td>Human Anatomy and Physiology 2</td>
</tr>
<tr>
<td>ZOOL 142L</td>
<td>Laboratory 2</td>
</tr>
<tr>
<td>ZOOL 200</td>
<td>Marine Biology</td>
</tr>
<tr>
<td>ZOOL 200L</td>
<td>Marine Biology Laboratory</td>
</tr>
<tr>
<td>MET 101</td>
<td>Introduction to Meteorology</td>
</tr>
<tr>
<td>MET 101L</td>
<td>Introduction to Meteorology Lab</td>
</tr>
<tr>
<td>GEOG 101</td>
<td>The Natural Environment</td>
</tr>
<tr>
<td>GEOG 101L</td>
<td>The Natural Environment laboratory</td>
</tr>
<tr>
<td>GG 101</td>
<td>Introduction to Geology</td>
</tr>
<tr>
<td>GG 103</td>
<td>Geology of the Hawaiian Islands</td>
</tr>
<tr>
<td>GG 166</td>
<td>Planetary Geology</td>
</tr>
<tr>
<td>GG 210</td>
<td>Oahu Field Geology</td>
</tr>
<tr>
<td>GG 211</td>
<td>Big Island Field Geology</td>
</tr>
<tr>
<td>GG 212</td>
<td>Maui Field Geology</td>
</tr>
<tr>
<td>GG 213</td>
<td>Molokai, Lanai, and Kahoolawe Field</td>
</tr>
<tr>
<td>GG 214</td>
<td>Kauai and Niihau Field Geology</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>CHEM 100</td>
<td>Chemistry in Society</td>
</tr>
<tr>
<td>CHEM 100L</td>
<td>Chemistry and Man Laboratory</td>
</tr>
<tr>
<td>CHEM 151</td>
<td>Elementary Survey of Chemistry</td>
</tr>
<tr>
<td>CHEM 151L</td>
<td>Elementary Survey of Chemistry Laboratory</td>
</tr>
<tr>
<td>CHEM 152</td>
<td>Survey of Organic and Bio Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 152L</td>
<td>Survey of Organic and Bio Organic Chemistry</td>
</tr>
<tr>
<td>CHEM 161</td>
<td>General Chemistry 1</td>
</tr>
<tr>
<td>CHEM 161L</td>
<td>General Chemistry Laboratory 1</td>
</tr>
<tr>
<td>CHEM 162</td>
<td>General Chemistry 2</td>
</tr>
<tr>
<td>CHEM 162L</td>
<td>General Chemistry Laboratory 2</td>
</tr>
<tr>
<td>CHEM 272</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>CHEM 272L</td>
<td>Organic Chemistry Laboratory I</td>
</tr>
<tr>
<td>CHEM 273</td>
<td>Organic Chemistry 2</td>
</tr>
<tr>
<td>CHEM 273L</td>
<td>Organic Chemistry Laboratory 2</td>
</tr>
<tr>
<td>PHRM 203</td>
<td>General Pharmacology</td>
</tr>
<tr>
<td>BOT 101</td>
<td>General Botany</td>
</tr>
<tr>
<td>BOT 105</td>
<td>Ethnobotany</td>
</tr>
<tr>
<td>BOT 130</td>
<td>Plants in the Hawaiian Environment</td>
</tr>
<tr>
<td>BOT 160</td>
<td>Identification of Tropical Plants</td>
</tr>
<tr>
<td>BOT 199/299</td>
<td>Independent Study</td>
</tr>
<tr>
<td>BOT 205</td>
<td>Ethnobotanical Pharmacognosy</td>
</tr>
<tr>
<td>BOT 210</td>
<td>Phytobiotechnology</td>
</tr>
<tr>
<td>MICR 130</td>
<td>General Microbiology</td>
</tr>
<tr>
<td>MICR 140</td>
<td>General Microbiology Laboratory</td>
</tr>
<tr>
<td>BIOI 275</td>
<td>Cell and Molecular Biology</td>
</tr>
<tr>
<td>BIOL 275L</td>
<td>Cell and Molecular Biology Laboratory</td>
</tr>
</tbody>
</table>