Honolulu Community College
General Education – DIVERSIFICATION DESIGNATION
Certification and Recertification
Application Form
Spring 2012

APPLICANT: Michael Ferguson

E-MAIL: mferguso@hawaii.edu

COURSE ALPHA and NUMBER: BIOC 241

COURSE TITLE: Fundamentals of Biochemistry

ESTIMATED NUMBER OF SECTIONS:
  Fall: 1
  Spring: 0

APPLICATION IS FOR:
  □ New Course  □ Modified Course  □ Existing Course  □ Re-designation
  □ Certification  x Re-Certification. Date of last certification:

DIVERSIFICATION AREA DESIGNATION SOUGHT:
  □ DA (Arts)
  □ DB (Biological Sciences)
  □ DH (Humanities)
  □ DL (Literature and Language)
  x  DP (Physical Sciences)
  □ DS (Social Sciences)
  □ DY (Laboratory)

What percentage of the CONTENT of this course focuses on this diversification area? 90

What percentage of CLASS MEETINGS focuses on this diversification area? 90
Guidelines and explanatory notes for the following questions are located at the end of this document.

1. **Hallmarks and SLOs.** Please explain how course-specific SLOs align with the diversification area’s hallmarks.

   DP.1 uses the terminology of the physical sciences;

   SLO 1. Demonstrate skills in employing the scientific method.

   SLO 2. Predict the properties of atoms and molecules.

   SLO 3. Demonstrate an understanding of pH and chemical equilibrium.

   SLO 4. Name the basic types of organic molecules.

   SLO 5. Demonstrate an understanding of the physical and chemical properties of the major organic functional groups.

   The scientific method uses specific terms such as hypothesis, theory, and law. The application of those terms to physical science is key in the course, which is covered in SLO 1. Chemistry is the study of matter and how matter changes and interacts (or lack thereof) to with itself and energy. Even the past statement requires much terminology like what matter is and is not and how different types of energy such as heat and radiation interact with it. The property predictions that chemistry can enable are covered with this. The vocabulary the students must learn are included in SLO 2. Similar to the argument for SLO 2, SLO 3-5 requires the students to expand their vocabularies to include the terminology of the physical sciences in describing pH, equilibrium, and organic molecules.

   DP.2 involves knowledge and theories relating to processes in the physical sciences;

   SLO 1. Demonstrate skills in employing the scientific method.

   SLO 2. Predict the properties of atoms and molecules.

   SLO 5. Demonstrate an understanding of the physical and chemical properties of the major organic functional groups.

   The scientific method covered in SLO 1 is the process behind all sciences, therefore the process of physical science will be included in all aspects of the course. Included with SLO 2 is a discussion of chemistry topics. Chemistry includes many basic constructs such as atomic theory. The knowledge of atomic theory and how it was derived shows the processes of the physical sciences. SLO 5 can be interpreted as an application of SLO 2. Predicting the properties of SLO 5 show that all points are validated in this hallmark.

   DP.3 demonstrates inquiry that involves observation/experiment and reasoning and mathematics.
1. Demonstrate skills in employing the scientific method.

2. Predict the properties of atoms and molecules.

3. Demonstrate an understanding of the physical and chemical properties of the major organic functional groups.

Observation and experimentation are part of the scientific method, which is covered in SLO 1. This implies that inquiry involving observation and experiment are present. Also, the data are analyzed and conclusions are drawn in the forms of theories and/or scientific laws. Certain scientific laws such as Boyle's Law are mathematical in nature. This shows SLO 1 corresponds to reasoning and mathematics as well. SLO 2 takes the principles of chemistry and applies it to predicting properties. In order to accomplish this, the student must employ reasoning. Similarly for SLO 5, the same reasoning for SLO 2 is applied to organic molecules. These points show how the SLOs meet the hallmark.

2. Assessment strategies. Explain assessment strategies you have used (or plan to use) to measure the degree to which students exit the course with the course-specific SLOs. If there are multiple sections of the course taught by different instructors, please discuss how assessment is (or will be) carried out across instructors.

There is informal feedback in terms of formative assessments during the lecture and summative tests. The informal formative feedback is by a multiple choice question asked during the lecture to see if the students understand the course material. These formative assessments are not graded, but are used to see if the students understand the material. The formative assessments also provide instant feedback to the instructor to see if the students understand the material.

The summative tests are multiple choice and typically correspond to 100% of this course's formal assessment. The test questions are based off of the SLOs, for instance some of the terms in the scientific method are directly tested. There are various types of multiple choice questions that are used in assessment. For instance, some questions simply test knowledge like in defining the terms in the scientific method. Also, there are questions based off of evaluations to determine if a chemical equation is properly balanced. Also there are various other types of questions like comparative questions between different theories, application type problems for chemistry in the environment, etc.

At the end of the term, course evaluations are passed out where the students can assess the course instructor and content. The student evaluations give direct feedback to the course. There is only one instructor teaching this course per term.

3. Assessment of assessment. How have you used (or plan to use) the assessment findings to modify or improve this course? If there are multiple sections of the course taught by different instructors, please discuss how review of assessment results is (or will be) carried out across instructors.
The assessment questions have changed to reflect more standardized type of questions. This is due to discussions I have had with other faculty at UH Manoa who expressed that these types of questions help prepare students to take more formal tests like the GRE or MCAT. The assessments have shown that the students do leave the course understanding the SLOs. Sometimes students will discuss questions after the exams. If the questions are ambiguous, those questions are no longer used.

There is only one instructor teaching this course per term. If there are more than one, then the instructors would meet to make sure the courses are congruent. This would be performed by similar or same questions in exams to see how the students perform across the board.
DIVERSIFICATION BOARD DECISION:

☑ Approved
Re-Certification Due: 8p 2017

☐ Not approved
If not approved, reasons for disapproval:

______________________________

Diversification Board Chair Signature: [Signature]
Date: 5/29/12
BIOC 241
Course Outline

Textbook: Chemistry a molecular approach, Tro, Pearson: 2011

General Description of Course:

BIOC 241 focuses on the fundamentals of general, inorganic, and bioorganic chemistry as they apply to living systems.

This course fulfills a physical science requirement for Honolulu CC for the AA degree, and a DP requirement for UHM

Student Learning Outcomes:

Upon successful completion of BIOC 241 the student will be able to:

1. Demonstrate skills in employing the scientific method.

2. Predict the properties of atoms and molecules.

3. Demonstrate an understanding of pH and chemical equilibrium.

4. Name the basic types of organic molecules.

5. Demonstrate an understanding of the physical and chemical properties of the major organic functional groups.

Grading:

The student’s grade in the course will be decided by 3 exams (20 Multiple Choice each) and online homework.

Students are responsible to properly mark scantron sheets properly. Any fault in improper marking of the scantrons or failure in forgetting to put names on the assessment is owned by the student.

Any types of academic dishonesty including cheating or plagiarism will result in the failure of the course.

Relative weights:

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Course Grades:

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Curving may be employed if necessary.

Course Topics:

• metric system and scientific notation.
• modern theories of atomic structure and radioactivity.
• periodic table and how it is used to predict chemical reactivity.
• chemical bonding.
• chemical formulas and names.
• kinetic molecular theory to explain chemical phenomena.
• mole concept.
• chemical equations.
• stoichiometry.
• equilibrium.
• acid-base theory and pH.
• solution chemistry and the behavior of dissolved substances.
• nomenclature for basic types of organic molecules.
• physical and chemical properties of hydrocarbons.
• physical and chemical properties of the major organic functional groups.

Student ACCESS:

Web Site: http://honolulu.hawaii.edu/disability

Student ACCESS provides coordinated services to help students with documented disabilities achieve their educational goals. Students requiring disability accommodations should submit requests in advance to HCC's Student ACCESS Office with appropriate disability documentation. For more information visit the Student ACCESS web site or call 844-2392 (voice/text).

Academic Dishonesty:

Academic Dishonesty: Academic dishonesty cannot be condoned by the University.
Such dishonesty includes cheating and plagiarism (examples of which are given below), which violate the Student Conduct Code and may result in expulsion from the University.

**Cheating** includes, but is not limited to:

- giving or receiving unauthorized assistance during an examination;
- obtaining unauthorized information about an examination before it is given;
- using inappropriate or unallowable sources of information during an examination;
- falsifying data in experiments and other research;
- altering the record of any grade;
- altering answers after an examination has been submitted;
- falsifying any official University record; or,
- misrepresenting the facts in order to obtain exemptions from course requirements.

**Plagiarism** includes, but is not limited to:

- submitting, in fulfillment of an academic requirement, any document that has been copied in whole or in part from another individual's work without attributing that borrowed portion to the individual;
- neglecting to identify as a quotation another's idea and particular phrasing that was not assimilated into the student's language and style or paraphrasing a passage so that the reader is misled as to the source;
- submitting the same written or oral material in more than one course without obtaining authorization from the instructors involved; or,
- drylabbing, which includes obtaining and using experimental data and laboratory write-ups from other sections of the course or from previous terms, or fabricating data to fit the desired or expected results.

Copies of the Student Conduct Code are available at the HCC Office of the Dean of Student Services.

Native Hawaiian Values

An understanding within the course is that the instructor and students will form a community where the following values will be upheld:

Aloha – Love, compassion, charity etc.

Laulima – To work together, Cooperation. "Many hands make light work"

Lokahi – Unity, Harmony, Agreement etc.

Malama – To take care of, care for, Preserve, Protect etc.

Kuleana – Responsibility, Rights, Privilege etc.
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