APPLICANT: Brent Rubio

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COURSE ALPHA and NUMBER: CHEM 161L

COURSE TITLE: General Chemistry I Laboratory

ESTIMATED NUMBER OF SECTIONS:
Fall: 1
Spring: 1

APPLICATION IS FOR:
☐ New Course ☐ Modified Course ☑ Existing Course ☐ Re-designation

☐ Certification ☑ Re-Certification. Date of last certification:

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

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

**DY.1: uses the laboratory methods of biological or physical sciences**

SLO 1. To develop skills in employing the scientific method.
SLO 2. To introduce the student to the techniques and concepts of laboratory experimentation.
SLO 3. To learn the limitations of measurements and the importance of careful observations
SLO 4. To perform experiments which demonstrate the chemicals, reactions, and principles discussed in the lecture course (Chem 161)

This laboratory class is an extremely hands on class that requires the students to set up, run, design, and clean up after their own experiments. From the first day, students are learning how to handle lab equipment that is universal to the biological and physical sciences like eye washes, sinks, fumehoods, showers, balances, and Bunsen burners (SLO 1, 2). Scientific method is used in almost every experiment and each experiment introduces a new laboratory method from gravity filtration, sublimations, titrations and more in which the student is collecting and processing data (SLO 4). As each laboratory method is taught, it doesn’t hold back in also letting the students discover the strengths and weakness of different chemical principles and methods (SLO 3)

**DY.2: involves processes and issues of design, testing, and measurement**

SLO 1. To develop skills in employing the scientific method.
SLO 2. To introduce the student to the techniques and concepts of laboratory experimentation.
SLO 3. To learn the limitations of measurements and the importance of careful observations

In this lab, the students are taught how to test a hypothesis by designing (SLO 1), experimenting (SLO 2) and collecting data via measurements, analysis and conclusions (SLO 3). As the students analyze their data, the realize that even the best process have design and measurement issues (SLO 2).

**DY.3: Demonstrates the strengths and limitations of the scientific method**

SLO 1. To develop skills in employing the scientific method.
SLO 2. To introduce the student to the techniques and concepts of laboratory experimentation.
SLO 3. To learn the limitations of measurements and the importance of careful observations
SLO 4. To perform experiments which demonstrate the chemicals, reactions, and principles discussed in the lecture course (Chem 161)

Part of the limitations in science is how effective the measurements are with regard to precision, error and accuracy (SLO 1), which all demonstrate the strengths and limitations of the scientific method used in each experiment. This lab reinforces the concepts of scientific method taught at the beginning of Chem 161 lecture (SLO 2, 3), which includes the strengths and limitations of the scientific method, like with the Lewis Dot Theory (SLO 4).
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.

Formative Assessments come in terms of performance evaluations during the experimentation itself (SLO 4). This is used to ensure safety and sustainability as the foremost concerns (SLO 2). This also allows the instructor to dock points if a student is acting unsafely or if the student does something that may cause environmental damage, with special attention to hazardous waste management.

Summative Assessments are made in forms of lab reports. Lab reports assess both the current weeks lab and the previous weeks lab. This ensures safety and preparation by the student, forcing them to read the lab handouts prior to coming class, making sure they understand the lab material before the start of the class, and that they pay attention during the lab, understand all the key concepts (SLO 1). In the lab reports, the student must demonstrate complete understanding of the concepts by answering the questions in the handout and record data that demonstrates their physical understanding of the principles (SLO 3).

Instructor assessments come in forms of student evaluations given at the end of the semester, where students have the opportunity to voice their opinions on the course, material, pace and instructor. This gives direct feedback on the course.

There is only one instructor for this course per term. If there is more than one in a term, then the instructors will all meet once a week to ensure courses are congruent and that assessment items are equivalent to ensure consistency across the board (experiments, reports, quizzes).

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.

Assessment of the formative assessments is done on the spot. If the instructor assesses a mishandling of chemicals or equipment, adjustments and corrections can be made to improve the current experiment. Further, as hazardous waste management goes, these assessments can be used to create a safer experiment for the lab and the environment as a whole and can be carried on in the next term.

Assessment of the summative assessments are done on a semester basis, and the quizzes and lab report scores can be reviewed to see which labs were better understood or not by the students. This way the labs that are not as successful can be adjusted or replaced on a semester by semester basis.

Additionally, student evaluations assessed at the end of each semester, will help determine which experiments should be adjusted or removed.
DIVERSIFICATION BOARD DECISION:

☑ Approved
Re-Certification Due: Fall 2017

☐ Not approved
If not approved, reasons for disapproval:

Diversification Board Chair Signature: [Signature]
Date: 9/14/12
Chem 161 L
Course Outline


General Description of Course:

This course is to supplement the general chemistry course. Its objective is to familiarize the student with some basic laboratory techniques. The laboratory will be a regime where the scientific method will meet a practical application.

Note: this course is meant to parallel Chem 161, so the laboratory experiments will parallel the course.

Student Learning Outcomes:

1. To develop skills in employing the scientific method.
2. To introduce the student to the techniques and concepts of laboratory experimentation.
3. To learn the limitations of measurements and the importance of careful observations
4. To perform experiments which demonstrate the chemicals, reactions, and principles discussed in the lecture course (Chem 161)

Articulation:

This course fulfills the physical science lab requirement for Honolulu Community College for the AA degree and a DY requirement for the University of Hawaii – Manoa.

Course Content:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>Aug 20</td>
<td>Safety</td>
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<td>Aug 27</td>
<td>Measurements</td>
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<tr>
<td>Sep 04</td>
<td>Physical and Chemical Properties</td>
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<tr>
<td>Sep 10</td>
<td>Moles</td>
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<tr>
<td>Sep 17</td>
<td>Study Period</td>
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<tr>
<td>Sep 24</td>
<td>Chemical Equations – Baking Soda</td>
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<td>Oct 01</td>
<td>Heat of Neutralization</td>
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<td>Oct 08</td>
<td>Diffusion</td>
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<td>Oct 15</td>
<td>Spectroscopy</td>
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<tr>
<td>Oct 22</td>
<td>Formula for Hydrates</td>
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<tr>
<td>Oct 29</td>
<td>Study Period</td>
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<tr>
<td>Nov 05</td>
<td>Formula of a Hydrate</td>
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<tr>
<td>Nov 12</td>
<td>Heat of Fusion</td>
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<tr>
<td>Nov 19</td>
<td>Periodic Trends</td>
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<td>Nov 26</td>
<td>Molecular Models</td>
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<tr>
<td>Dec 03</td>
<td>Evaluations</td>
</tr>
</tbody>
</table>
Grading:

The student's grades will be determined by the laboratory reports and a grade for safety and environmental consciousness. Laboratory reports are due a week after the experiment at the beginning of lab. Late labs will be docked a letter grade per day late. More than two unexcused absences from a lab will result in the failure of the course. If a student has a reasonable, documented excuse, a make-up in terms of a project or paper will be assigned. The project must be submitted electronically. Any types of academic dishonesty including cheating or plagiarism will result in the failure of the course.

Special note on safety: this is a laboratory course; so safe lab practices must always be in effect. Students participating in unsafe lab practices like improper personal protective equipment or mishandling of chemicals may either be docked 1-5% of the semester grade, be expelled from the lab with no chance of a make up and/or face other sanctions decided by the instructor. Every participant in the lab must have personal protective equipment when chemicals are present in the laboratory. If a student does not have proper personal protective equipment at the start of class he or she will be asked to leave the laboratory. Personal protective equipment includes safety glasses, closed toe shoes, pants (covering the knee) and shirts with sleeves.

10% of the semester grade will be tied to safety and environmental consciousness. A student will receive all marks unless he or she engages in unsafe behavior. In order to care for the Earth, environmental consciousness will also be a part of the lab grade. Improper disposal of laboratory waste will result in a loss of marks.

20% of the lab grade will be tied to 10 laboratory quizzes. The quiz will follow the lecture materials. The quizzes will be open book. Quizzes take place at the start of the lab.

Course Grades:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent</th>
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<tbody>
<tr>
<td>A</td>
<td>100-90%</td>
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<tr>
<td>B</td>
<td>89-80%</td>
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<tr>
<td>C</td>
<td>79-70%</td>
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<tr>
<td>D</td>
<td>69-60%</td>
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<tr>
<td>F</td>
<td>Below 60</td>
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Due to department policy, students must complete at least 8 labs to pass the course.

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 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.

'Ike – Knowledge, Awareness and/or Understanding