APPLICANT: Michael Ferguson

E-MAIL: mferguson@hawaii.edu

COURSE ALPHA and NUMBER: Chem 105C

COURSE TITLE: Cosmetic chemistry

ESTIMATED NUMBER OF SECTIONS:
   Fall: 1
   Spring: 1

APPLICATION IS FOR:
   x New Course  □ Modified Course  □ Existing Course  □ Re-designation

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

<table>
<thead>
<tr>
<th>DP.1 uses the terminology of the physical sciences;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLO 1. Demonstrate an understanding of the scientific method.</td>
</tr>
<tr>
<td>SLO 2. Demonstrate an understanding of the elements and principles of chemistry.</td>
</tr>
<tr>
<td>SLO 3. Demonstrate an understanding the scientific concepts behind the methods and procedures used in treating hair, skin, and fingernails.</td>
</tr>
<tr>
<td>SLO 4. Recognize the chemical nature of the compounds in hair, skin, fingernails, and cosmetic preparations.</td>
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</tbody>
</table>

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 vocabulary the students must learn are included in SLO 2. Similar to the argument for SLO 2, SLO 3, and SLO 4 requires the students to expand their vocabularies to include the terminology of the physical sciences.

<table>
<thead>
<tr>
<th>DP.2 involves knowledge and theories relating to processes in the physical sciences;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLO 1. Demonstrate an understanding of the scientific method.</td>
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</table>

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 3 and SLO 4 can be interpreted as applications of SLO 2. Continuing the example with atomic theory, applications such as the chemical constituents of cosmetic products and the chemical nature of hair and skin show that all points are validated in this hallmark.
DP.3 demonstrates inquiry that involves observation/experiment and reasoning and mathematics.

SLO 1. Demonstrate an understanding of the scientific method.

SLO 3. Demonstrate an understanding the scientific concepts behind the methods and procedures used in treating hair, skin, and fingernails.

SLO 4. Recognize the chemical nature of the compounds in hair, skin, fingernails, and cosmetic preparations.

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 3 and SLO 4 takes the principles of chemistry and applies it to the specific field of cosmetology. For instance, the hair and skin need to be at a specific pH to be healthy, and products need to be formulated such that the skin does not get damaged by the products. That example involves experimental data and how those data are analyzed.

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 75% 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 cosmetology, etc. I will also do demonstration-like chemical experiments where the students will have to observe a chemical or physical phenomenon and then analyze it. This will correspond to a quarter of the class assessment.

At the end of the term, course evaluations are performed 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. Even though cosmetology would seem like a terminal degree without the consideration of students seeking a graduate degree, I did have a student who was extremely business savvy and intended on opening her own salon. I would not be surprised if she went on for an MBA. In personal discussions with other students, I know that some of them seek other degrees like nursing and pharmacy.

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.

Since this is a support class, I also work with the cosmetology department to ensure that the content of the course meets the needs of the program. We periodically have informal discussions and will continue to do so.
DIVERSIFICATION BOARD DECISION:

☑ Approved
Re-Certification Due: Fall 2018

☐ Not approved
If not approved, reasons for disapproval:

Diversification Board Chair Signature: [Signature]
Date: 12/17/2013
Course Alpha & No.: Chem 105C  
Proposer: Michael Ferguson  
Effective Term: Fall 2014

PROPOSAL SUMMARY (Include reasons for adding course, and similar courses offered elsewhere, i.e. college, alpha, number, title):

This course is a support course for the cosmetology program. It is a chemistry course that is specifically designed to supplement the cosmetology program. The students will not only learn about chemistry, but also about the chemical contents and hazards associated with the profession of cosmetology.

SIGNATURES

Proposal:  
Initiator / Date:  
General Education Board (if applicable) / Date:  

Approval:  
Division Curriculum Committee Chair / Date:  
Program Dean / Date:  
Committee on Programs & Curricula Chair / Date:  

Vice Chancellor of Academic Affairs / Date:  
Chancellor / Date:  

### Course Details

**Course Alpha & No.:** Chem 105C  
**Effective Term:** Fall 2014

**Course Type:** Regular  
**Experimental Course Expiration Date:**

| Title: | Cosmetic Chemistry |
| Banner Title (30 characters): | Cosmetic Chemistry |

**Is this course certified to meet Career & Technical Education (AS/ AAS/ ATS) GEN ED Requirements?**  
**If "YES", select GEN ED below:**

- Communications (ASCM)  
- Quantitative or Logical Reasoning (ASQL)  
- Humanities and Fine Arts (ASGD)  
- Natural Sciences (ASGA)  
- Social Sciences (ASGC)

**Is this course certified to meet Liberal Arts (AA) GEN ED Requirements &/or UHM GEN ED Core Articulation?**  
**If "YES", select GEN ED below:**

<table>
<thead>
<tr>
<th>LBART FOUNDATION</th>
<th>LBART DIVERSIFICATION</th>
<th>LBART OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA UHM</td>
<td>AA UHM</td>
<td>AA UHM</td>
</tr>
<tr>
<td>Written Communication (FW)</td>
<td>Arts [Click To Select] (DA)</td>
<td>AA Speech</td>
</tr>
<tr>
<td>Symbolic Reasoning (FS)</td>
<td>Humanities (DH)</td>
<td>AA Elective (AAEL)</td>
</tr>
<tr>
<td>Global/Multicultural Perspectives (FG)</td>
<td>Literature and Language (DL)</td>
<td>Foreign/Hawaiian Language</td>
</tr>
<tr>
<td>[Click To Select]</td>
<td>Biological Sciences (DB)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Biological Sciences Lab (DY)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physical Sciences (DP)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Physical Sciences Lab (DY)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Sciences (DS)</td>
<td></td>
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</table>

### Course Information

- **Class Length:** 17 weeks  
- **Credits:** 3 credits  
- **Repeat & Credit Limit:** Students may enroll _ time(s) for a maximum of _ credit(s)

**Schedule Type:** LEC (Lecture)

**Weekly Student Contact Hrs:**  
- 3 Hours Lecture per Week  
- Hours Lab per Week  
- 3 Total Contact hrs per Week

**Grading Option:** Letter Grade Only

**Enrollment Maximum:** 24  
**Major Restriction:** Cosme  
**Recommended Prep:**  
**Special Approval:** None

**Cross-Listed Courses:**

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*Rev. Sept. 2012*
**Course Alpha & No.:** Chem 105C  
**Effective Term:** Fall 2014

<table>
<thead>
<tr>
<th>Prerequisite: *</th>
<th>Prerequisite: &quot;C&quot; or higher in ENG 19 and/or ENG 21, OR ESL 13 &amp; 14, OR Placement in ENG 22/60 or ESL 23; &quot;C&quot; or higher in MATH 9, OR Placement in MATH 24/50/53</th>
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<tbody>
<tr>
<td>Prerequisite or Co-requisite:</td>
<td></td>
</tr>
<tr>
<td>Co-requisite:</td>
<td>Cosme 30 and 31L</td>
</tr>
</tbody>
</table>

**Catalog Course Description:**
Application of chemical principles to cosmetology. The course content will include: atomic structure, chemical bonding, acids and bases, hair structure, shampoos, bleaches and tints, waving and hair straightening.

**Additional Information to print with Catalog Course Description:**

**Class Availability Comment (Web viewable):**

**Course SLOs:** (Attach Course Outline Form)

**Course Outline:** (Attach Course Outline Form)

**IMPACT**

- **YES ☐ NO** Are any PROGRAMS impacted by this proposal? (i.e. Program Credits, Courses, Prerequisites, Requirements, Electives, etc.)
  - *If “Yes” attach Program Modification Form(s) and briefly explain below.*

- **YES ☐ NO** Are any COURSES impacted by this proposal? (i.e. Course Prerequisites, Co-requisites, Recommended Prep, Cross-Lists, etc.)
  - *If “Yes” attach Course Modification Form(s) and briefly explain below.*

- **YES ☐ NO** Were the affected Programs/Departments consulted and notified of the proposed changes?

- **Describe impact on Programs and/or Courses (Attach appropriate Program Modification and Course Modification Forms.**

**MISC.**

- **YES ☐ NO** Does this proposal require additional resources? (i.e. staff, equipment, facilities, etc.) If yes, provide details below.

**Additional Information:**
## Course Outline

See Instructions for information on each item.

### Course Alpha & No.: Chem 105C  
Semester Credit Hours: 3  
Effective Term: Fall 2014

<table>
<thead>
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<th>Cosmetology Chemistry</th>
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<td>Prerequisites or Co-requisite:</td>
<td></td>
</tr>
<tr>
<td>Major Restriction:</td>
<td>Cosme</td>
</tr>
<tr>
<td>Instructor Approval or other Approval:</td>
<td></td>
</tr>
</tbody>
</table>

### Catalog Course Description:
Application of chemical principles to cosmetology. The course content will include: atomic structure, chemical bonding, acids and bases, hair structure, shampoos, bleaches and tints, waving and hair straightening.

### Student Learning Outcomes:
Upon successful completion of this course, a student will be able to:
1. Demonstrate an understanding of the scientific method.
2. Demonstrate an understanding of the elements and principles of chemistry.
3. Demonstrate an understanding the scientific concepts behind the methods and procedures used in treating hair, skin, and fingernails.
4. Recognize the chemical nature of the compounds in hair, skin, fingernails, and cosmetic preparations.

### Means by which the assessment of the SLOs will be accomplished:
Summative tests.

### Program Learning Outcomes addressed by this course:
- List safety and sanitation procedures for use of equipment, implements, and treatments
- Perform the basic analytical skills to determine proper makeup, hairstyle, and color application for the client's overall image
- Apply learned theory, technical information and related matter to assure sound judgments, decisions, and procedures
- Apply learned theory, manipulative skills and analytical skills to obtain licensure and competency in entry-level positions in cosmetology or a related career field.

### Method(s) of Instruction:
Lecture

### Method(s) of Evaluation:
Summative tests

### Course Content:
- Module 1. Chemistry and atoms
- Module 2. Atomic structure and chemical bonding
- Module 3. Chemical accounting and intermolecular forces
- Module 4. Acids/bases and oxidation/reduction
- Module 5. Biochemistry
- Module 6. Safety
- Module 7. Shampoos, conditioners, and hair aids

### Possible Texts:
Chemistry for Changing Times

### Reference and/or Auxiliary Materials (if any):
Class notes

### Resource Requirements (if applicable):
<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>11.</td>
<td>Relationship to other courses in the program (if applicable):</td>
</tr>
<tr>
<td>12.</td>
<td>General Education or other requirement(s) satisfied:</td>
</tr>
<tr>
<td></td>
<td>Natural Sciences</td>
</tr>
<tr>
<td>13.</td>
<td>Articulation (if applicable):</td>
</tr>
<tr>
<td></td>
<td>DP</td>
</tr>
<tr>
<td>14.</td>
<td>Additional information of importance:</td>
</tr>
</tbody>
</table>
Chem 105C
Course Outline

Instructor: Michael J. Ferguson Ph.D.
Office: 5-208A
e-mail: mferguso@hawaii.edu
AIM: HIChemistry
Skype: hichemistry
Phone: 845-9494
Class times: MW 1:30-2:45
Website: https://laulima.hawaii.edu/portal

Textbooks

Chemistry for Changing Times, 12th edition, John W. Hill and Doris Kolb, Pearson, NJ.

General Description of Course

Application of chemical principles to cosmetology. The course content will include: atomic structure, chemical bonding, acids and bases, hair structure, shampoos, bleaches and tints, waving and hair straightening.

This course fulfills the DP diversifications for degree requirements.

Student Learning Outcomes

1. Demonstrate an understanding of the scientific method.
2. Demonstrate an understanding of the elements and principles of chemistry.
3. Demonstrate an understanding the scientific concepts behind the methods and procedures used in treating hair, skin, and fingernails.
4. Recognize the chemical nature of the compounds in hair, skin, fingernails, and cosmetic preparations.

Course Content

Module 1. Chemistry and atoms
Module 2. Atomic structure and chemical bonding
Module 3. Chemical accounting and intermolecular forces
Module 4. Acids/bases and oxidation/reduction
Module 5. Biochemistry
Module 6. Safety
Module 7. Shampoos, conditioners, and skin products

Grading:
The student’s grade in the course will be decided by laboratory exercises and 2 exams. The laboratory exercises will be chemical demonstrations and subsequent analysis. Any types of academic dishonesty including cheating or plagiarism will result in the failure of the course.

Relative weights:

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm exam</td>
<td>30%</td>
</tr>
<tr>
<td>Final exam</td>
<td>45%</td>
</tr>
<tr>
<td>Lab Reports (9)</td>
<td>25%</td>
</tr>
</tbody>
</table>

Midterm exam Mod 1-5
Final exam Mod 1-7

Videos online:

To aid the students, lessons and prelabs are also posted online on youtube. These will aid students who wish to emulate a classroom experience. The name of the youtube page is HIChemistry.

Course Grades:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>100-90%</td>
</tr>
<tr>
<td>B</td>
<td>89-80%</td>
</tr>
<tr>
<td>C</td>
<td>79-70%</td>
</tr>
<tr>
<td>D</td>
<td>69-60%</td>
</tr>
<tr>
<td>F</td>
<td>Below 60</td>
</tr>
</tbody>
</table>

Curving may be employed if necessary.

**Student ACCESS:**

**Web Site:** [http://hono.lulu.hawaii.edu/disability](http://hono.lulu.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.

'Ike – Knowledge, Awareness and/or Understanding