UNIVERSITY OF HAWAII COMMUNITY COLLEGES
PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE

(July 26, 1973)

TYPE OF ACTION (circle appropriate)
A. Addition X
B. Regular
C. Experimental
3. Other ARTICULATION (specify)

B. DELETION

NEW ALPHA, NUMBER AND TITLE
CHEM 162 General Chemistry

OLD ALPHA, NUMBER AND TITLE
NA

NEW DESCRIPTION Basic principles of chemistry. Introduction to concepts including thermochemistry, kinetics, equilibrium

PRELIMINARY OR RECOMMENDED 3. STUDENT CONTACT HOURS PER WEEK 9. PROPOSED DATE OF
PREPARATION 3 Lecture Lab 9 FIRST OFFERING
credit in CHEM 161 Other (specify) Fall 1983

THIS COURSE IS (REQUIRED) (ELECTIVE) FOR THE Arts and Science PROGRAM

THIS COURSE (CREASES) (DECREASES) (MAKES NO CHANGE) IN THE NUMBER OF CREDITS REQUIRED FOR THE PROGRAM

SIMILAR COURSES OFFERED ELSEWHERE
○ College(s) UH Manoa

Alpha, Number, Title:
CHEM 162 General Chemistry

This course is (required for articulation) (appropriate for articulation)

Provide details of existing or desired articulation (date, college(s), purposes, pre-major or major, etc.): Fall 1983 UH Manoa for students in the College of Arts & Sciences. This course meets a core requirement in natural science and is required for many science related degrees.

REASON FOR INITIATING, MODIFYING OR DELETING COURSE OR PERTINENT COMMENT:

To articulate with the change in the chemistry course offerings at UH Manoa

REQUESTED BY MATH/SCIENCE

APPROVED BY Phyllis Omatrout

Curriculum Committee

Date

Dean of Instruction

Date

Provost

Date
A. Information Needed for Processing ALL Course Proposals

Course Title: General Chemistry

Transfer X Non-transfer

Submitted Pearl Takeuchi Date January 17, 1983

1. Course Objectives:
   a. Provide a suitable background in chemical concepts and skills for students planning careers in the physical and life sciences.
   b. To enable the student to understand chemical concepts and use them to solve problems.
   c. To familiarize students with an overall perspective of unifying themes in chemistry.
   d. To provide the student with an understanding of how principles of chemistry can be applied in specific fields of interest.

2. Provide details of additional staff, equipment facilities, library/media material and equipment, other financial support that would be required to implement the new course or the course modification.

Has this additional cost been included in the budget for the proposed date of offering? Include in estimate of actual cost of supplies and equipment in addition to cost already budgeted by the discipline.

No additional costs are required since this course is part of a redesign of the freshman chemistry course to cover the same material in a two semester format rather than in the present one semester format. All of the necessary staff, facilities, equipment and media are in place. The departmental budget is adequate to maintain the needed supplies.
C. Information Needed to Process New Course Proposals

1. Course relation to EDP of the College:
   This course relates to the college's goal of serving the needs of individuals who are seeking to meet baccalaureate program requirements for four-year colleges in Hawaii and in other locales.

2. Program course in (Please give some information concerning the status of the program and the relation of the course to the program):
   In the college of Arts and Science at UH Manoa, this course meets a core requirement in natural science and is required for many science related degree programs.

3. Independent work by students:
   - Reading textbook
   - Studying lecture notes
   - Completing problem sets
   - Participating in optional learning activities such as computer assisted instruction.

4. Rationale for articulation with UHM General Education Core—attach Windward Community College Form 3 for transfer course criteria, if appropriate:
   This course is the same as CHEM 162: General Chemistry that is offered by the chemistry department at UH Manoa.

5. If similar to an upper division course, explain community college application:
   NA

6. If course is experimental and unique to Windward Community College, indicate additional rationale and impact on college curriculum, if appropriate:
   NA

D. Attach Course Outline for New Course Proposals or for Course Modifications that involve changes in content, syllabus, or time schedule. Use the Windward Community College Form 2: General Course Outline for Proposed Course. A student course outline may be submitted, if it indicates the syllabus, content, and time schedule of the proposed course.
TRANSFER COURSE CRITERIA

Course: CHEM 162 General Chemistry

New: X    Modified: 

Submitted by: Pearl Takahashi    Date: January 17, 1983

1. RATE OF STUDENT PROGRESS: Thermochemistry, thermodynamics, kinetics, equilibrium, acid-base equilibria, precipitation equilibria, electrochemistry, descriptive chemistry, nuclear chemistry.

   See attached course outline for details of the course schedule.

2. BASIC SKILLS NEEDED:

    13th grade reading level
    registration or credit in college algebra

3. AMOUNT OF SKILLS AND INDEPENDENT WORK REQUIRED:

   Must be able to read a college level chemistry textbook with understanding. Must be able to solve problems involving chemical concepts that require mathematical skills at the level of college algebra. Must be able to visualize and manipulate abstract concepts relating chemical properties to the structure of matter.

4. REASONING REQUIRED:

   Must be able to interpret experimental data and relate this to theories and models that explain these observations. Must be able to solve problems that require the application of chemical principles and mathematical skills.

5. CONCEPTUAL COURSE LEVEL:

   Concepts and principles applied in problem solving situations.

6. BACKGROUND KNOWLEDGE PREREQUISITE:

   Credit in CHEM 161

7. MASTERY LEVEL EXPECTED:

   Ability to achieve at a satisfactory level on a series of examinations designed to test mastery of the concepts covered.

8. COUNTERPART IN 4 YEAR CAMPUS:

    CHEM 162 or 161

9. COURSE USE IN MAINLAND ACCREDITED SYSTEMS:

    This is a standard lower division college chemistry course that is taught at all colleges and universities.
WCC CURR. FORM 2

GENERAL OUTLINE FOR PROPOSED COURSE.

Course: CHEM 167: General Chemistry
Transfer: X Nontransfer: New: X Modified: _______

1. COURSE DESCRIPTION:
   See attached student course outline

2. HOURS PER WEEK: LEC: 3 LAB: OTHER: _______ TOTAL: 3

3. PREREQUISITIES: See attached student course outline
   COREQUISITIES: See attached student course outline
   RECOMMENDED PREPARATION: See attached student course outline

4. SPECIFIC COURSE OBJECTIVES: See attached student course outline

5. TEXTBOOK AND MATERIALS: See attached student course outline

6. REFERENCE MATERIAL SAMPLES: See attached student course outline

7. AUXILIARY MATERIALS: See attached student course outline
COURSE NAME: General Chemistry
COURSE ALPHA: CHEM 162
CREDIT HOURS: 3

CATALOG DESCRIPTION: Basic principles of chemistry. Introduction to concepts of chemistry including thermochemistry, kinetics, equilibrium.

REQUIREMENTS COURSE SATISFIES:

At UCC: Meets AA degree science requirements

At UH MANOA: May meet science requirement

PREREQUISITES: credit in CHEM 162

RECOMMENDED SPECIAL PREPARATION: None

RECOMMENDED BASIC SKILLS LEVELS:

Reading level of text: 13th grade
Credit or registration in MATH 120

ACTIVITIES REQUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIMES: None

INSTRUCTOR: Pearl Takeuchi
OFFICE: Iolani 107
OFFICE PHONE: 235-0077 ext. 183
EFFECTIVE DATE: Fall semester 1983
A. Goals of the Course:

1. To provide a suitable background in chemical concepts and skills for students planning careers in the physical and life sciences.

2. To enable the student to understand basic chemical concepts and to use those principles to solve problems.

3. To familiarize the student with an overall perspective of unifying themes in chemistry.

4. To provide the student with an understanding of how principles of chemistry can be applied in specific fields of interest.

B. Objectives of the Course:

1. The student will demonstrate an understanding of the basic concepts of chemistry and the ability to apply them to solve appropriate problems by scoring a satisfactory grade on three Mid-Term Exams that will be given throughout the semester. These Mid-Term Exams will be multiple choice tests covering the materials discussed in three or four topics. There will be no opportunities for retakes on these Mid-Term Exams. The Mid-Term Exams will be graded on a curve, unless the standard curve (90%-100% = A) is more favorable to the students.

2. The student will demonstrate the ability to apply chemical principles to solve appropriate problems by submitting the solutions to all assigned problem sets. These solutions must indicate that the student has reached the minimum level of achievement of the relevant objectives as stated for each problem set. The student is encouraged to discuss these problem sets with the instructor and peers. The solutions may be resubmitted once in order to achieve a higher level of understanding of the objectives involved.

3. The student will demonstrate the ability to synthesis and apply basic chemical concepts by achieving a minimum score of 40% on the final examination that includes all of the objectives of the course.

C. Method of Grading:

<table>
<thead>
<tr>
<th>Grade</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>% of semester grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective</td>
<td>Average of three Mid-Term Exams will be graded on a curve.</td>
<td>40</td>
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<tr>
<td>Mid-Term Exam</td>
<td>83-100</td>
<td>75-74</td>
<td>60-74</td>
<td>40-59</td>
<td>40</td>
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<tr>
<td>Average of problem sets</td>
<td>Graded on a curve</td>
<td>70</td>
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</tbody>
</table>

1. In calculating the semester grade, the average of the unit test grades will represent 40%, the average of the grade on the problem set will represent 40%, and the result of the final exam will represent 20% of the semester grade.
2. The course grades will be assigned as follows:

   A - weighted average of 60-100% on objectives 1-3
   B - weighted average of 70-87% on objectives 1-3
   C - weighted average of 60-74% on objectives 1-3
   D - weighted average of 50-59% on objectives 1-3
   F - weighted average of 0 - 39% on objectives 1-3

I - incomplete, the student agrees to complete the required objectives by the end of the succeeding semester. If this is not done, the I will revert to the contingency grade identified by the instructor.

W - official withdrawal after the third week of the course and prior to the tenth week of the course.

D. Mode of Instruction:

The lecture/discussions mode of instruction will be very important in this course. However, there will be a variety of audio-visual modes, such as movies, film strips, and film loops used as well. Some of these may be used by the individual student in the college library or in the audio tutorial center in the Iolani building. When ever possible, self-paced instructional material will be available to the student. Special problem solving and tutorial sessions may also be arranged to meet specific student needs.

Text book - (Required):

General Chemistry: Principles and Structure, (3rd ed.) by James E. Brady and Gerald E. Humiston

Study Guide - (Optional):

Study Guide and Selected Problem Solutions to Accompany General Chemistry: Principles and Structure, by James E. Brady and Gerald E. Humiston

F. Other Information:

Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>Thermochemistry; Thermodynamics</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>Chemical Kinetics</td>
</tr>
<tr>
<td>3</td>
<td>13</td>
<td>Chemical Equilibrium</td>
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<tr>
<td>4</td>
<td>15</td>
<td>Acid-Base Equilibria</td>
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<tr>
<td>5</td>
<td>16</td>
<td>Hydrolysis, Buffers</td>
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<tr>
<td>6</td>
<td>17</td>
<td>Solubility and Complex Ion Equilibria</td>
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<tr>
<td>7</td>
<td>17</td>
<td>Electrochemistry, Standard Electrode Potentials</td>
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<tr>
<td>8</td>
<td>17</td>
<td>K_a From our Data; Batteries and Fuel Cells</td>
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<tr>
<td>9</td>
<td>18</td>
<td>Chemistry of Representative Metals</td>
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Please turn to next page.
<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>19</td>
<td>Chemistry of Hydrogen, Carbon, Oxygen, Nitrogen</td>
</tr>
<tr>
<td>11</td>
<td>20</td>
<td>Chemistry of Phosphorus, Sulfur, Halogens, Noble Gases, Silicon</td>
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<tr>
<td>12</td>
<td>21</td>
<td>The Transition Elements</td>
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<td>13</td>
<td>22</td>
<td>Organic Chemistry</td>
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<tr>
<td>14</td>
<td>23</td>
<td>Biochemistry</td>
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<tr>
<td>15</td>
<td>24</td>
<td>Nuclear Chemistry</td>
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