UNIVERSITY OF HAWAI'I COMMUNITY COLLEGES
PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE
CCCH /6100
(July 26, 1983)

1. NAME OF COURSE (circle appropriate)
   ☐ Modification
   ☐ Additions
   ☐ Regular
   ☐ Experimental
   ☐ Other

2. ARTICULATION (specify)

3. OLD ALPHA, NUMBER AND TITLE
   CHEM 161 General Chemistry

4. NEW ALPHA, NUMBER AND TITLE
   CHEM 161 General Chemistry

5. CREDITS
   3

6. CREDITS
   NA

7. PREPARATION FOR ADEQUATE COURSE \( y \) FOR \( p \) ADEQUATE \( p \) COURSE I (OLD) \( n \) FOR \( n \) ADEQUATE \( n \) COURSE I (NEW)
   3 Lecture \( y \) Lab \( n \)

8. STUDENT CONTACT HOURS PER WEEK
   3

9. PROPOSED DATE OF FIRST OFFERING
   Fall 1983

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

THIS COURSE (XX) (XX) (XX) (XX) (XX) (MAKES NO CHANGE) IN THE NUMBER OF CREDITS REQUIRED FOR THE PROGRAM.

SIMILAR COURSES OFFERED ELSEWHERE
   College(s) UH Manoa
   Alpha, Number, Title: CHEM 161 General Chemistry

THIS COURSE IS (XXX) (XXX) (XXX) (XXX) (XXX) (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 offerings at UH Manoa

REQUESTED BY
   MATH / SCIENCE
   Chairperson
   Date: 28-1-83

APPROVED BY
   Phil Hunt
   Curriculum Committee
   Date: 1-21-83

   Roy H. Hymada
   Dean of Instruction
   Date: 3-1-84

Provost
   Date

Other required campus signature
   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:

1. To provide the student planning a career in the physical or life sciences with a suitable background in chemical concepts and skills.
2. To enable the student to understand basic chemical concepts and to use these principles to solve problems.
3. To familiarize the student with an overall perspective of unifying themes in chemistry.

2. 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 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 supply of consumable materials.
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 text book
   - Studying lecture notes
   - Completing problem sets
   - Participating in optional learning activities such as computer-assisted instruction

4. Rationale for articulation with UH General Education Core—attach Windward Community College Form 3 for transfer course criteria, if appropriate:
   This course is the same as CHEM 161: 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.

The student course outline submitted with this form provides the information required here.
TRANSFER COURSE CRITERIA

Course: CHEM 161 General Chemistry

Rate of Student Progress: Chemical calculations, atomic structure, chemical bonding, phases of matter, gas laws, solution chemistry.

See attached course outline for details of course schedule.

Basic Skills Needed:
13th grade reading level registration or credit in college algebra.

Amount of Skills and Independent Work Required:
Must be able to read a college level general 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.

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.

Conceptual Course Level:
College level chemical concepts and principles applied in problem solving situations.

Background Knowledge Prerequisite:
4 yrs. high school algebra, plane geometry, high school chemistry, and a satisfactory score on a screening exam. Or credit in CHEM 151.

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

Counterpart in 4 Year Campus:
CHEM 161 General Chemistry at UI-Mecca

Course Use in Mainland Accredited Systems:
This is a standard first year college chemistry course that is taught in all colleges and universities.
CHEM 161: General Chemistry

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: NA

7. AUXILIARY MATERIALS: See attached student course outline
COURSE NAME: General Chemistry

COURSE ALPHABET: CHEM 161

CREDIT HOURS: 3

CATALOG DESCRIPTION: Basic principles of chemistry. Introduction to concepts of chemistry including electronic structure, chemical bonding, solutions, chemical calculations.

REQUIREMENTS COURSE SATISFIES:

At WCC: Meets AA degree science requirements

At UN HAWAII: May meet science requirement

PREREQUISITES: 2 yrs. of high school algebra, 1 yr. of plane geometry, high school chemistry, satisfactory score on a screening exam, or CHEM 151.

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: 235-3077 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 Average of three Mid-term Exams will be graded on a curve</td>
<td>40</td>
<td></td>
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<tr>
<td>Average of problem sets</td>
<td>50-69</td>
<td>70-86</td>
<td>60-74</td>
<td>50-59</td>
<td>40</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Graded on a curve</td>
<td>20</td>
<td></td>
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</tbody>
</table>

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 88-100% on objectives 1-3
B - weighted average of 75-87% on objectives 1-3
C - weighted average of 60-74% on objectives 1-3
D - weighted average of 40-59% on objectives 1-3
E - weighted average of 20-39% on objectives 1-3
F - 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/discussion's 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 Island 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.

E. Textbook - (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>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>The Science of Chemistry</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Stoichiometry</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Electrical and Nuclear Nature of Atoms; Electronic Structure of Atoms</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Periodicity; Atomic Spheres; Energy Levels</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>Quantum Mechanical Description of Atoms</td>
</tr>
<tr>
<td>6</td>
<td>1-4</td>
<td>Ionic and Covalent Bonding, Lewis Structures</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>Molecular and Condensed Phase; Directed Valence</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>Atoms and Chemical Bonding, Valence and Energy</td>
</tr>
<tr>
<td>9</td>
<td>8-9</td>
<td>Chemical Reactions in Aqueous Solution</td>
</tr>
</tbody>
</table>

Please turn to the next page...
Course Schedule (cont.)

<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>7</td>
<td>Gases and Gas Laws</td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>States of Matter and Intermolecular Forces</td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>Nature of Solutions; Concentration</td>
</tr>
<tr>
<td>13</td>
<td>10</td>
<td>Colligative Properties</td>
</tr>
<tr>
<td>14</td>
<td>9</td>
<td>The Periodic Table Revisited</td>
</tr>
<tr>
<td>15</td>
<td>14</td>
<td>Acid Base Nomenclature; Strength; Lewis Theory</td>
</tr>
</tbody>
</table>
MEMORANDUM

TO: Undergraduate Advisers in Programs Requiring Chemistry

FROM: J.L. Ihrig, Chairman

SUBJECT: Lab Course to Accompany Chemistry 161

March 7, 1986

Beginning this coming fall semester, we will phase in separate laboratory work to complement our one-year general chemistry course: CHEM 161-162. The first increment is a new course (1 CR) called CHEM 161L which is designed to accompany CHEM 161, the lecture course. It requires 161 credit or concurrent registration.

Students taking either CHEM 162 or 171 this Fall 1986 should take the 171L lab course just as before. There will be a separate 162L ready for students taking CHEM 162, the lecture course in the Spring 1987 semester.

Please call me at x7480 or Tom Bopp at x7463, if you have questions.

ATC