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

1. TYPE OF ACTION
   A. Addition  X  Regular  [ ] Experimental  [ ] Other (specify)
   B. Deletion  [ ]
   C. Modification  [ ] in credits  [ ] in title  [ ] in number or alpha  [ ] in prerequisites  [ ] Other (specify)

2. NEW ALPHA, NUMBER AND TITLE
   Math 203: Calculus for Business & the Social Sciences

3. CREDITS

4. OLD ALPHA, NUMBER AND TITLE

5. CREDITS

6. NEW CATALOG DESCRIPTION
   Basic mathematical concepts, topics in differentiation, and introductory integration of algebraic, exponential and logarithmic functions. Related applications to management, finance, economics and the social sciences will be considered.

7. PREREQUISITES
   Grade of C or better in Math 135 or equivalent; or satisfactory math placement test score; or consent of instructor.

8. STUDENT CONTACT HOURS PER WEEK
   Lecture 3  Lecture/Lab  __  Lab  __  Other (specify) __

9. PROPOSED DATE OF FIRST OFFERING
   Summer 1997

10. THIS COURSE
    [ ] IS REQUIRED  X  IS AN ELECTIVE FOR THE WCC AA PROGRAM/CORE
    [ ] CAN FULFILL Quantitative/Logical Reasoning REQUIREMENT (Please specify)

11. THIS COURSE
    [ ] INCREASES  [ ] DECREASES  [ ] MAKES NO CHANGE IN NUMBER OF CREDITS REQUIRED FOR THE PROGRAM/CORE

12. SIMILAR COURSES OFFERED ELSE WHERE:
    College(s):
    UH Manoa
    UHM-College of Arts & Sciences - Core requirement-Quantitative/Logical Reasoning
    Leeward CC, Honolulu CC
    QM 122: Mathematics for Decisionmaking II

13. THIS COURSE IS
    [ ] ALREADY ARTICULATED with
    [ ] APPROPRIATE FOR ARTICULATION with UHM, UH H, UHCC
    [ ] NOT YET APPROPRIATE FOR ARTICULATION
    (Provide details of existing or desired articulation (date, college(s), purposes, pre-major or major, etc.) UHCC-AA degree req. UHM-College of Arts & Sciences - Core requirement-Quantitative/Logical Reasoning UHCC-College of Business-Quantitative/Logical Reasoning UH H-College of Arts & Sciences-1B (other)

14. REASON FOR INITIATING, MODIFYING OR DELETING COURSE OR OTHER PERTINENT COMMENT:
    To provide for the needs of those students who plan to obtain a bacc. degree in Business or Social Sciences.
    To provide diversity in course offerings in mathematics for Quant/Logical Reasoning Req.

REQUESTED BY: [Signature]
Department Chairperson
Date: 1-21-97

APPROVED BY: [Signature]
Curriculum Committee
Date: 11/29/97

Faculty Senate
Date: 6/27/97

Dean of Instruction
Date: 2-7-97

Provost
Date: 3/19/97

Change recorded by Catalog Preparer
### Levels of Review of Course Proposals at WCC

<table>
<thead>
<tr>
<th>Signatures</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subject Area (one or more instructors in the area)</td>
<td>1/15/97</td>
</tr>
<tr>
<td>[Signatures]</td>
<td>1/15/97</td>
</tr>
<tr>
<td>[Signatures]</td>
<td>1/21/97</td>
</tr>
<tr>
<td>[Signatures]</td>
<td>1/21/97</td>
</tr>
<tr>
<td>2. Department</td>
<td>1-21-97</td>
</tr>
<tr>
<td>[Signatures]</td>
<td>1-21-97</td>
</tr>
<tr>
<td>Department Chairperson</td>
<td>1-21-97</td>
</tr>
<tr>
<td>Was this course discussed in a dept. mtg.</td>
<td>Yes</td>
</tr>
<tr>
<td>[Signatures]</td>
<td>1-21-97</td>
</tr>
<tr>
<td>3. Division</td>
<td>1-22-97</td>
</tr>
<tr>
<td>[Signatures]</td>
<td>1-22-97</td>
</tr>
<tr>
<td>Assistant Dean of Instruction</td>
<td>1-22-97</td>
</tr>
<tr>
<td>4. Curriculum Committee Review</td>
<td></td>
</tr>
<tr>
<td>Approved</td>
<td>X</td>
</tr>
<tr>
<td>Disapproved</td>
<td></td>
</tr>
<tr>
<td>Reason:</td>
<td></td>
</tr>
<tr>
<td>[Signatures]</td>
<td>1/29/97</td>
</tr>
<tr>
<td>Curriculum Committee Chairperson</td>
<td>1/29/97</td>
</tr>
</tbody>
</table>
COURSE ARTICULATION FORM

ORIGINATING CAMPUS: Windward CC
COURSE ALPHA & NUMBER: Math 203
COURSE TITLE: Calculus for Business & the Social Sciences
DATE OF OUTLINE: Spring Year 1997

1. Articulation committee to review this course:
   A. Standing Committees
      - Written Communication
      - Mathematical & Logical Thinking
      - World Civilizations
      - Languages
      - Arts & Humanities
      - Natural Science
      - Social Science
   B. Special Discipline/Program Committee
      Specify discipline/program

2. In the opinion of the originating campus, this course is equivalent to the following and/or meets the criteria for the indicated core categories:

<table>
<thead>
<tr>
<th>Receiving Campus</th>
<th>Equivalent Course (Alpha and Number)</th>
<th>Core Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>UH Hilo</td>
<td>Math 115</td>
<td>1B Other/1B Math</td>
</tr>
<tr>
<td>UH Manoa</td>
<td>Math 297</td>
<td>ML</td>
</tr>
<tr>
<td>UH West Oahu</td>
<td>Unknown</td>
<td>NS</td>
</tr>
<tr>
<td>Hawaii CC</td>
<td>Math 122</td>
<td>OLR</td>
</tr>
<tr>
<td>Honolulu CC</td>
<td>QM 122</td>
<td>ML</td>
</tr>
<tr>
<td>Kapiolani CC</td>
<td>Unknown</td>
<td>ML</td>
</tr>
<tr>
<td>Kauai CC</td>
<td>Unknown</td>
<td>OLR</td>
</tr>
<tr>
<td>Leeward CC</td>
<td>QM 122</td>
<td>ML</td>
</tr>
<tr>
<td>Maui CC</td>
<td>Unknown</td>
<td>OR</td>
</tr>
<tr>
<td>Windward CC</td>
<td>Unknown</td>
<td></td>
</tr>
</tbody>
</table>

3. Notes

Revised 1/29/93
WOC FORM FOR NEW COURSE PROPOSALS

Course Math 203 Submitted by J. Okumura Date 1/15/97

1. How is this course related to the educational needs and goals of the College/Department/Community as reflected in the EDP?
   This course is related to the ADP goal of enriching the Liberal Arts Transfer Program. There are a number of WCC students who indicate a desire to obtain a bacc. degree in Business. This course would help them to meet their quantitative/logical reasoning req. in a shorter time period because students will be able to take this course immediately after Math 135. In addition, it would diversify the courses available in mathematics at WCC.

2. Provide details of any additional staff, equipment, facilities, library/media material, faculty preparation and other financial support that would be required to implement this course. (Include an estimate of the actual cost of supplies and equipment.) What has been done to provide for these additional costs for the proposed date of offering? Who will teach the course?
   No additional staff is needed. Current math faculty are qualified to teach the course. No additional equipment or library/media materials are needed to implement this course.

3. Is a similar course taught elsewhere in the UH system? yes
   If yes, provide details of how this course differs from existing similar courses.
   It is equivalent to Math 297 at UHM, Math 115 at UHH, QM 122 at HonCC and LCC, Math 115 at HawCC. It is similar to QM 252 at KapCC and MauCC except that it has coverage of the topic: Calculus of Several Variables.

4. Is this course experimental and/or unique to Windward Community College? NO
   If yes, provide rationale and details of its impact on the College curriculum.

5. Is a similar course taught on the upper division level by a 4-year UH college? NO
   If yes, explain why this course is appropriate at the lower division or how it differs from its upper division counterpart.

6. Please attach a complete course outline. Your course outline should address all the items listed in the Guidelines for Course Outlines.

7. If this course is numbered 100 or above or appropriate for transfer to a 4-year college, complete and attach WOC Form for Transfer Courses (blue). (See attached criteria for transfer courses.)
WCC FORM FOR TRANSFER COURSES
(To be completed for articulation with any 4-year UH campus)

Course Math 203 Submitted by J. Okumura Date 1/15/97

1. List the counter part to this course on any 4-year UH campus. Describe the relationship between the course and any related baccalaureate program area.
   UHManoa - Math 297-Satisfies Quantitative/Logical Reasoning Req. for College of Arts & Sciences and College of Business
   UHHilo - Math 115-Satisfies Requirement 1B (other)
   UHWest Oahu - Satisfies Natural Sciences Req.

2. Is this course taught or accepted by major accredited colleges or universities? Give one or two examples.
   Yes.
   Oregon State University: Math 241: Calculus for Management & Social Sciences
   Univ. of North Carolina at Chapel Hill: Math 22: Calculus for Business & Social Sci.

3. Please attach a complete course outline, if you have not done so already. Your course outline should address all the items listed in the Guidelines for Course Outlines.

WCC 9/91
WINDWARD COMMUNITY COLLEGE
OUTLINE OF COURSE OBJECTIVES

COURSE NAME: CALCULUS FOR BUSINESS AND THE SOCIAL SCIENCES
COURSE NUMBER: MATH 203
COURSE CREDITS: 3 credits
CATALOG DESCRIPTION: Basic mathematical concepts, topics in differentiation, and introductory integration of algebraic, exponential and logarithmic functions. Related applications to management, finance, economics and the social sciences will be considered.
PREREQUISITES: Grade of C or better in Math 135, PreCalculus-Elementary Functions, or equivalent; or satisfactory math placement test score; or consent of instructor.
REQUIREMENTS COURSE SATISFIES AT WCC: Satisfies the mathematical and/or quantitative reasoning requirement for the associate degree.
POSSIBLE TEXT: Calculus, 5th Ed. by Bittinger
READING LEVEL OF TEXT: 13 (Approximately)
ACTIVITIES REQUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIMES: Homework; Additional learning activities in the Math Lab or TLC, as necessary.
EFFECTIVE DATE: SPRING 1997
A. Goals of the Course

1. To engender the learning of the fundamental precepts, concepts and properties of differential calculus and integral calculus.

2. To nurture the student’s problem solving skills.

3. To facilitate the student’s comprehension of the nature of proofs through logical, deductive means, and to simultaneously augment the student’s understanding through intuitive means.

4. To inculcate the relevance of calculus through applications in management, finance, economics and the social sciences.

5. To prepare the business or social science student for endeavors which have calculus as a prerequisite.

B. Objectives of the Course

Upon the completion of the course, the student will be able to:

1. Calculate derivatives of (non-trigonometric) elementary functions and their sums, products, quotients and compositions.

2. Intuitively understand limits and continuity.

3. Apply methods of differential calculus to business and/or social science problems such as marginal analysis, optimization of profit and cost functions and inventory control.

4. Evaluate integrals using basic formulas and substitution.

5. Apply methods of integral calculus to business problems such as marginal analysis, growth problems and surplus problems.
C. Mode of Instruction

The mode of instruction is primarily discussion-problem solving where the initial portion of the class meeting may be utilized to discuss and clarify any questions from the preceding class session and/or assignment, and the remaining portion is used to discuss new material. After the completion of each unit of instruction, a review and an exam will be conducted.

D. Method of Grading

The student will demonstrate competency in the objectives by turning in assignments as requested, by taking in-class unit exams and quizzes and by taking a final exam over concepts and skills covered in the entire course. Assignments may be problems from the text and/or on handouts. Assignments may also include other activities such as journals (writing assignments) or oral presentations. Exams and quizzes are to be taken within the classroom environment and without any references unless otherwise stipulated by the instructor.

It will be the student's responsibility to obtain and complete all assignments which are given in any class meeting for which the student in unable to attend. Unless permission is granted by the instructor, assignments, texts and quizzes must be completed and submitted to the instructor at the specified date and time.

Points will be assigned to each exam, graded quiz and assignment that counts toward the student's grade. Additional work, active student participation in class discussions, positive attitude about learning and responsible actions regarding the class may be used to help determine "borderline" cases.

Each letter grade for the course will be assigned according to the level of achievement as provided in the table below:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90% - 100% of the cumulative points possible</td>
</tr>
<tr>
<td>B</td>
<td>80% - 89% of the cumulative points possible</td>
</tr>
<tr>
<td>C</td>
<td>70% - 79% of the cumulative points possible</td>
</tr>
<tr>
<td>D</td>
<td>60% - 69% of the cumulative points possible</td>
</tr>
<tr>
<td>F</td>
<td>Less than 60% of the cumulative points possible</td>
</tr>
<tr>
<td>Cr</td>
<td>70% - 100% of the cumulative points possible</td>
</tr>
<tr>
<td>NC</td>
<td>Less than 70% of the cumulative points possible</td>
</tr>
<tr>
<td>W</td>
<td>Official Withdrawal</td>
</tr>
<tr>
<td>I</td>
<td>Incomplete - given when a student has failed to complete a small part of the course due to circumstances beyond his/her control.</td>
</tr>
</tbody>
</table>

Note: Cr/NC grades require written instructor consent. Students must apply for Cr/NC grading option at the Admissions Office by the 10th week of classes. If a student does not officially apply for Cr/NC grading option by the required deadline and if s/he does not withdraw, a letter grade (A, B, C, D, F) will be assigned for the course.

Note: W grade is given only when the student officially withdraws from the course at the Admissions Office by the 10th week of classes.
SYLLABUS FOR MATH 203

1. Introduction, Limits, and Continuity (1 - 1.5 weeks)

2. Differentiation (3 weeks)
   Average rate of change, the derivative, differentiation rules, differentials, implicit differentiation. Applications to cost, revenue, profit, elasticity of demand.

3. Curve Sketching (1.5 - 2 weeks)
   Increasing and decreasing functions, concavity, extreme values, optimization, inventory control.

4. Exponential and Logarithm Functions (2 weeks)
   Functions, derivatives, applications, growth, compound interest.

5. Integration (2 - 2.5 weeks)
   Antiderivatives, areas, Fundamental Theorem of Calculus, integration by substitution, consumers' and producers' surpluses, continuous cash flows.

6. Functions of Several Variables (2 weeks)
   Functions of two variables, partial derivatives, relative maxima and minima, applications.