UNIVERSITY OF HAWAII COMMUNITY COLLEGES
PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE
EXHIBIT II
CCCM #6100
(July 28, 1979)

TYPE OF ACTION (circle appropriate)
A. Addition
B. Deletion
C. Modification
1. in credits
2. in title
3. in number or alpha
4. in prerequisites
5. Other Content (specify)

2. NEW ALPHA, NUMBER AND TITLE
Math 135 Pre-Calculus: Elementary Functions

4. OLD ALPHA, NUMBER AND TITLE
Math 130 Pre-Calculus: College Algebra

6. NEW DESCRIPTION
An analysis of elementary functions. A synthesis of polynomial, rational, exponential and logarithmic functions. Topics also include graphing techniques, transformations, applications, sequences, series, math induction, binomial theorem and related topics. Emphasis is placed on topics which will...

8. PREREQUISITES OR RECOMMENDED PREPARATION
Math 27; satisfactory math placement test score; or consent of instructor.

10. THIS COURSE IS (REQUIRED) (ELECTIVE) FOR THE AA PROGRAM

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

12. SIMILAR COURSES OFFERED ELSEWHERE
College(s):
All UH Community Colleges (except perhaps Hawaii CC)

13. THIS COURSE IS (ALREADY ARTICULATED) (APPROPRIATE FOR ARTICULATION) (NOT APPROPRIATE FOR ARTICULATION)

14. REASON FOR INITIATING, MODIFYING OR DELETING COURSE OR OTHER PERTINENT COMMENT:

1. UHM will no longer offer Math 130 and will no longer accept Math 130 as a course satisfying the quantitative/logical reasoning requirement for the College of Arts & Sciences. Moreover, Math 130 will no longer be accepted as a prerequisite for Math 140. It is desirable to maintain both articulations for Math 13

2. All community college math representatives met, except for Hawaii CC, with a representative of the Chancellor's office and agreed to propose Math 135 in lieu of Math 130. The proposed course is college level and it has been agreed that it is a necessary and beneficial course to prepare students for calculus

REQUESTED BY

APPROVED BY

PROVOST

WCC 7/85 * See next page.
prove useful to students planning to take calculus and also to those who are interested in pursuing math related careers.
WCC FORM FOR COURSE MODIFICATIONS

Course Math 135 Submitted by Jean Okumura Date 2/17/87

1. What change is proposed in the course? Provide specific information comparing both the "new" and "old" course.

The "new" course will be numbered Math 135 instead of Math 130. The new course will have a slightly revised course content as compared to the previous Math 130. Basic concepts, properties and equations of a remedial nature will not be discussed in Math 135. Higher degree polynomial functions, transformation of graphs, graphing techniques, the theory of real zeroes of polynomial functions and applications will be examined in more detail than in Math 130.

2. Is the course articulated with any 4-year program? Math 130 is articulated. If yes, give details of the agreement(s) and explain any impact the proposed modifications may have on articulation.

Math 130 is accepted as a course that satisfies the quantitative / logical reasoning requirement for the BA degree. Furthermore, students who complete Math 130 at a community college then transfer to UHM do not need to take the placement test and can register for Math 140. It is desirable to maintain both articulation for the "new" Math 135 course. Math 130 is articulated until the end of Summer 1987.

3. Provide details of any additional staff, equipment, facilities, library/media material and other financial considerations that would be required to implement this course modification. What has been done to provide for these additional costs?

No additional costs for changing the Math 130 number to Math 135.

4. Will this course modification result in any alterations in the number of hours required to attain a certificate or degree? No If yes, provide details and justification for these alterations.

5. Will the content of the "old" course be modified? Yes If yes, attach a course outline for the "new" course. Your course outline should address all the items listed in the Guidelines for Course Outlines.
WCC FORM FOR TRANSFER COURSES

(To be completed for articulation with any 4-year UH campus)

Course Math 135 Submitted by Jean Okumura Date 2/17/87

1. List the counterpart to this course on any 4-year UH campus. Describe the relationship between the course and any related baccalaureate program area.

There will be no counterpart to this course at UHM beginning Fall '87.

2. Is this course taught or accepted by major accredited colleges or universities?

Yes.

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.
COURSE NAME: PRECALCULUS: Elementary Functions
COURSE NUMBER: MATH 135
COURSE CREDITS: 4 credits
CATALOG DESCRIPTION: An analysis of elementary functions. A synthesis of polynomial, rational, exponential and logarithmic functions. Topics also include graphing techniques, transformations, applications, sequences, series, math induction, binomial theorem, and related topics. Emphasis is placed on those topics which will prove useful to students planning to take calculus and also to those who are interested in pursuing math related careers.
PREREQUISITES: Math 27, Intermediate Algebra, or equivalent; or satisfactory math diagnostic/placement test score; or consent of the instructor.
REQUIREMENTS COURSE SATISFIES AT:
   WCC: Satisfies the mathematical and/or quantitative reasoning requirement for the associate degree.
   UHM: May satisfy the quantitative and logical reasoning requirement, which is one of the six general education core requirements for the bachelor’s degree.
TEXTBOOKS AND OTHER ASSIGNED INSTRUCTIONAL MATERIALS:
REQUIRED TEXT(S): Algebra and Trigonometry with Applications, 2nd Edition by Munem and Foulis
READING LEVEL OF TEXT(S): 13 (approximately)
ACTIVITIES REQUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIMES:
(1) Homework
MATH RESOURCE CENTER: Lono 103
INSTRUCTOR: Jean Okumura
OFFICE: Mahi 112
OFFICE HOURS: To be announced in class
PHONE: 235-7482 - direct to my office, Mahi 112
       235-0077 - Main switchboard; Messages can be left with the operator to be forwarded to the instructor.
       235-7485 - Math Resource Center
EFFECTIVE DATE: Fall 1987
A. Goals of the Course
1. To provide the student with mathematical skills and with an understanding of functional concepts which are prerequisite for further studies in mathematics and/or the sciences.
2. To enhance the student's mathematical reasoning ability.
3. To extend the student's frame of reference in comprehending and applying complex concepts.
4. To nurture the growth of the student's problem-solving ability within the domain of mathematics.
5. To promote a greater appreciation of mathematics in the contemporary society both as a service tool and as an aesthetic structure.

B. Objectives of the Course
Upon the completion of the course, the student will be able:
1. To define, discuss, develop and apply the concepts, types, properties and graphs of relations and functions.
2. To investigate particular types of polynomial functions (linear and quadratic functions).
3. To utilize algebraic techniques and theorems in the analysis of higher degree polynomial functions, their solutions and properties.
4. To discuss, define, apply and sketch the composite and inverse of functions.
5. To derive and apply sequences, summation notation, progressions, mathematical induction, combinations and permutations, binomial theorem and probabilities.
6. To be able to employ various techniques to graph functions, including transformation techniques.
7. To discuss, define, apply, and sketch exponential and logarithmic functions.

The student shall demonstrate competency in the preceding course objectives through assignments, quizzes and exams. Exams and quizzes are to be performed within the classroom environment and without any references unless otherwise stipulated.
C. Expectations of students
Success in this course will be enhanced by:
1. a positive, inquiring attitude toward mathematics;
2. setting aside adequate time for studying;
3. setting aside adequate time for working on problems;
4. seeking assistance from the instructor or the math resource center personnel whenever necessary;
5. class attendance and participation;
6. maintaining accurate class notes.

D. Mode of Instruction
The mode of instruction is primarily lecture-discussion where the initial portion of each class period may be utilized to discuss and clarify any questions from the preceding class meeting, and the remaining portion is used to present and discuss new material. After the completion of each unit of instruction, a review and an exam will be conducted.

A student may apply to the instructor for independent study. If approved, the student works on the materials independently contingent upon a contract between the student and the instructor. Please see the instructor for further details concerning this mode of instruction.

E. 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.

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

Points will be assigned to each graded assignment, exam and quiz. 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 registrar's office by the 10th week of classes (5th week of classes for 8 wk courses). This grading option is not available in all courses and will not be offered to majors in required courses.

Note: W grade is given only when the student officially withdraws from the course at the registrar's office by the 10th week of classes (5th week of classes for 8 wk courses).

F. Other information

1. A diagnostic test, which will be used only for advising and not for grading the student, will be administered sometime during the first week of classes.
Week 1
0. Preliminary Concepts
   a. Inequalities (quadratic, rational)
   b. Absolute value equations & inequalities
   c. Interval Notation

Weeks 2-4
1. Functions and Relations
   a. Domains and Ranges
   b. Odd and Even Functions
   c. Continuous & Discontinuous Function (piecewise functions)
   d. Composite and Inverse Functions
   e. Increasing/Decreasing Functions
   f. Algebra of Functions

Weeks 5-10
2. Algebraic Functions
   a. Linear Functions
   b. Quadratic Functions
   c. Higher Degree Polynomial Functions
   d. Rational Functions
   e. Other Algebraic Functions
   f. Asymptotes
   g. Techniques of Graphing (translations, other transformations)
   h. Real Zeros of Polynomial Functions
   i. Partial Fraction Decomposition

Weeks 11-12
3. Exponential & Logarithmic Functions
   a. Exponential Functions
   b. Logarithmic Functions
   c. Properties of Logarithms
   d. Equations & Applications
**Week 13-15**

4. Sequences, Series, and Other Topics
   a. Arithmetic & Geometric Sequences and Series
   b. Intuitive Limits
   c. Mathematical Induction
   d. Binomial Theorem
   e. Permutation/Combinations
   f. Probability