## UNIVERSITY OF HAWAII COMMUNITY COLLEGES

### EXHIBIT II

**PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE**

**CCC# 6100**

*(July 26, 1979)*

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### TYPE OF ACTION (circle appropriate)
- Addition
- Deletion
  - Regular
  - Experimental
  - Other [TEMPORARY ONLY FOR SPRING 87]

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### NEW ALPHA, NUMBER AND TITLE

| MATH 111 "Mathematics for Prospective Elementary School Teachers"

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### OLD ALPHA, NUMBER AND TITLE

- **CREDIT**

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### NEW DESCRIPTION

Study of concepts and properties of number systems. Prospective elementary education majors only; not applicable to Arts & Sciences core requirements.

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### PREREQUISITES OR RECOMMENDED PREPARATION

Math 27, satisfactory math diagnostic/placement test score or consent of instructor.

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### STUDENT CONTACT HOURS PER WEEK

- **3 Lecture**
- **1 Lab**
- Other [SPECIFY]

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### PROPOSED DATE OF FIRST OFFERING

Spring 1987

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### THIS COURSE IS (REQUIRED) (ELECTIVE) FOR THE AA PROGRAM

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

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### SIMILAR COURSES OFFERED ELSEWHERE

<table>
<thead>
<tr>
<th>College(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>UHM Math 111 &quot;Mathematics for Prospective Elementary School Teachers&quot;</td>
</tr>
<tr>
<td>LCC Math 111 &quot;Mathematics for Prospective Elementary School Teachers&quot;</td>
</tr>
</tbody>
</table>

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### THIS COURSE IS (ALREADY ARTICULATED) (APPROPRIATE FOR ARTICULATION) (NOT APPROPRIATE FOR ARTICULATION)

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### PROVIDE DETAILS OF EXISTING OR DESIRED ARTICULATION (Date, college(s), purposes, pre-major or major, etc.):

Desired Articulation: Spring 1987 College of Education pre-education Quantitative/Logical Reasoning requirement for elementary and secondary education programs.

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

1. To provide more alternatives for students in mathematics.
2. To service the needs of students who desire to major in elementary education and whose needs are not currently being met by WCC's existing curricula.
3. To address concerns that have been expressed by faculty of UHM College of Education.

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### REQUESTED BY

Math/Science Department/Division: [SPECIFY]

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### APPROVED BY

Chairperson: [SIGNATURE]

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### DEAN OF INSTRUCTION

[SIGNATURE]

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### DATE

REQUESTED: [DATE]

APPROVED: [DATE]
WCC FORM FOR NEW COURSE PROPOSALS

Course Math 111 Submitted by Jean Okumura Date 9/26/86

1. How is this course related to the educational needs and goals of the College/Department/Community as reflected in the EDP?
   
   It is intended to meet the needs of individuals intending to transfer to a four-year college to earn a bachelor's degree. In addition to the above, it services students interested in acquiring skills and knowledge needed for employment in selected occupational fields. (See EDP for reference)

2. Provide details of any additional staff, equipment, facilities, library/media material 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?

   No additional staff needed. It is planned to offer the course once per year in the Spring semester.

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.

   There may be a slight variation of topics within the general heading of number systems. This course will be taught in a lecture/discussion mode rather than a total discussion mode that is used at UHM and LCC.

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 appropriate for transfer to a 4-year UH college, complete and attach WCC Form for Transfer Courses (blue).
WCC FORM FOR TRANSFER COURSES

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

Course Math 111 Submitted by J. Okumura Date 9/26/86

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.

Math 111 at UHM: Satisfies Quantitative/Logical Reasoning pre-education requirement for elementary and secondary education programs in the College of Education.

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.
WINDWARD COMMUNITY COLLEGE
OUTLINE OF COURSE OBJECTIVES

COURSE NAME: Mathematics for Prospective Elementary School Teachers
COURSE NUMBER: Math 111
COURSE CREDITS: 3 credits
CATALOG DESCRIPTION: Study of concepts and properties of number systems. Prospective elementary education majors only; not applicable to Arts & Sciences core requirements.
PREREQUISITES: Math 27, satisfactory math diagnostic/placement test score or consent of instructor

REQUIREMENTS COURSE SATISFIES AT:

WCC: May be used as an elective for the AA or AS degree.
UHM: Satisfy Quantitative/Logical Reasoning pre-education requirement for elementary and secondary education programs in the College of Education.

TEXTBOOKS AND OTHER ASSIGNED INSTRUCTIONAL MATERIALS:

REQUIRED TEXT(S): The Nature of Mathematics by Karl J. Smith (latest edition)

And supplementary materials

READING LEVEL OF TEXT(S): 13th grade

ACTIVITIES REQUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIMES:

Homework, Math Resource Center Activities

MATH RESOURCE CENTER: Lono 103

Hours to be posted at the beginning of the semester

INSTRUCTOR: Jean Okumura
OFFICE: Mahi 112
OFFICE HOURS: To be announced in class
OFFICE 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: Spring 1987
OUTLINE OF COURSE OBJECTIVES

A. Goals of the course

The goals of this course are:

1. To expose the student to mathematical systems and to mathematical problem-solving.
2. To expose the student to the concept of a mathematical model, system, or structure so that the areas of pure and applied mathematics may be more clearly comprehended.
3. To cultivate in the student an appreciation for mathematics.
4. To increase the student’s awareness of the diversity, power, and relevance of mathematics as a service tool to a broad spectrum of disciplines as well as to realize the limitations of mathematics in quantifying qualitative phenomena.
5. To nurture the growth of the student’s problem-solving ability through the utilization of mathematical models.

B. Objectives of the course

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

1. To observe a phenomena or problem; determine its salient features or characteristics; delimit its parameters or constraints; define the assumptions; delineate or select a model, structure an alternative which will enable the student to achieve a solution; apply the model and properties of this model to obtain a solution, and evaluate and analyze the preceding procedures.
2. To define and delineate the components of a mathematical structure system, or model and to derive and verify conjectures within a mathematical system, structure, or mode.
3. To construct diagrams which will facilitate the visual conception of a phenomena or problem.
4. To efficiently and effectively communicate one’s observation, strategies for solving a problem and method of solution.
5. To demonstrate competency in the principles and concepts of probability, statistics, functions, and number theory.
C. Mode of Instruction
There will be some lecture/discussion conducted by the instructor. However, the class will primarily involve student directed discussions or problem solving discussions.

D. Method of Grading
The student will demonstrate competency in the objectives by turning in assignments as requested, by taking in-class 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, tests and quizzes 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. The student must achieve a minimum of 50% of the possible points for each exam. Furthermore, the student must achieve a minimum of 50% of the possible points for the final exam. Without these two minimum requirements, a passing grade for the course is not possible.

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>
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<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>50% - 69% of the cumulative points possible</td>
</tr>
<tr>
<td>F</td>
<td>Less than 50% of the cumulative points possible or less than 50% on any exam</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 or less than 50% on any exam</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>
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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).
MATH 111: TENTATIVE COURSE SCHEDULE

WEEK 1 - 2  PROBLEM SOLVING
Theoretical and practical analyses of problems and problemsolving. General problemsolving methods or the subject of heuristic.

WEEK 3 - 4  INDUCTIVE REASONING
EXAM ONE

WEEK 5 - 6  DEDUCTIVE REASONING

WEEK 7 - 8  SETS, NUMERATION, COUNTING, AND NUMBER SYSTEMS
Operations with sets, sets, and set language. Methods of numeration, and historical numeration systems. Number bases. Rational, irrational, and real numbers and their properties.
EXAM TWO

WEEK 9 - 10  PROBABILITY

WEEK 11 - 12  STATISTICS
Statistical graphs. Interpreting statistical data. Measures of central tendency and variation. Statistical distributions and their applications, such as normal distributions, binomial distribution, etc.
EXAM THREE

WEEK 13 - 14  NUMBER THEORY
Exploration of elementary number theory with applications.

WEEK 15 - 16  MATHEMATICAL MODELLING, RELATIONS, AND FUNCTIONS
Cartesian products. Graphs. Algebra of functions, such as composition and inverses. Illustrations of mathematical modelling.
EXAM FOUR

WEEK 17  REVIEW AND CUMULATIVE FINAL EXAM
OUTLINE OF COURSE OBJECTIVES

A. Goals of the course
The goals of this course are:
1. To involve the student in thinking about mathematical ideas.
2. To develop the student's ability to convey mathematical thoughts and ideas clearly and concisely to others in the oral and written form.
3. To expose the student to mathematical systems and to mathematical problem-solving.
4. To engender the learning (or relearning) of elementary precepts, concepts and properties of real numbers and other number systems, probability, statistics and functions.
5. To cultivate in the student an appreciation for mathematics.
6. To nurture the growth of the student's problem-solving ability through the utilization of mathematical models.

B. Objectives of the course
Upon completion of this course, the student will be able:
1. To observe a phenomenon or problem; determine its salient features or characteristics; delimit its parameters or constraints; define the assumptions; delineate or select a model, structure an alternative which will enable the student to achieve a solution; apply the model and properties of this model to obtain a solution, and evaluate and analyze the preceding procedures.
2. To define and delineate the components of a mathematical structure system, or model and to derive and verify conjectures within a mathematical system, structure, or model.
3. To construct diagrams which will facilitate the visual conception of a phenomena or problem.
4. To efficiently and effectively communicate one's observation, strategies for solving a mathematical problem and method of solution.
5. To demonstrate competency in the principles and concepts of probability, statistics, functions, and number theory.

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.

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.

D. Mode of Instruction
There will be some lecture/discussion conducted by the instructor. However, the class will primarily involve student directed discussions or problem-solving discussions. Class participation is a major part of this course. More information on class activities will be provided in class.

E. Method of Grading
The student will demonstrate competency in the objectives by turning in assignments as requested, by taking two in-class exams and quizzes and by taking a final exam over concepts and skills covered in the entire course. The grade for the course will be determined primarily by the student's level of achievement on the unit objectives. However, optional work, class attendance, and active student participation in class discussions will help to determine "borderline" cases.

Points will be assigned to each graded assignment, exam and quiz. The student must achieve a minimum average of 50% of the possible points for all exams. Second, the student must complete and submit all assignments. Without these two minimum requirements, a passing grade for the course is not possible. Each letter grade for the course will be assigned according to the level of achievement as provided in the following table:

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**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.
2. There is no make-up for missed quizzes.
3. Make-up opportunities for the midterms and final exam will be possible only upon presentation of a serious and documented explanation of the student's absence from the class exam. The instructor has the right to determine if the absence from the exam is justified. The make-up examination must be taken within a week of the class exam date unless otherwise specified by the instructor.
4. The student can determine how well s/he is doing during any part of the term by dividing his/her cumulative score by the cumulative points possible and applying the table above.
MATH 111 - TENTATIVE SCHEDULE

WEEK 1 - 2  PROBLEM SOLVING
  Theoretical and practical analyses of problems and problem solving.
  General problem solving methods or the subject of heuristic.

WEEK 3 - 4  INDUCTIVE AND DEDUCTIVE REASONING
  Mathematics in the making as an experimental, inductive science.
  Mathematics "in statu nascendi," in the process of being invented.
  Scientific method, Logical connectives. Rules of inference, Properties
  of logical systems. Nature of proof.

EXAM ONE

WEEK 5 - 6  SETS, NUMERATION, COUNTING AND NUMBER SYSTEMS
  Operations with sets and set language. Methods of numeration, and
  historical numeration systems. Number bases. Rational, irrational and
  real numbers and their properties.

WEEK 7 - 9  PROBABILITY AND STATISTICS
  Permutations, combinations. Probability experiments. Sample spaces
  and populations. Composite events and conditional probability. Expected
  values. Random numbers. Statistical graphs. Interpreting statistical
  data. Measures of central tendency and variation. Statistical
  distributions and their applications, such as normal distributions, etc.

EXAM TWO

WEEK 10 - 12  NUMBER THEORY
  Exploration of elementary number theory with applications.

WEEK 13 - 15  MATHEMATICAL MODELLING, RELATIONS, AND FUNCTIONS
  mathematical modelling.

WEEK 16  REVIEW AND FINAL EXAM