

MATH 112 MATHEMATICS FOR ELEMENTARY TEACHERS II

3 Credits

TTh 11:30 AM – 12:45 PM

INSTRUCTOR:	Kevin A. Takayama, Instructor, Mathematics		
OFFICE:	Hale Mana‘opono 105		
OFFICE HOURS:	MW 9:45 AM – 11:15 AM; TTh 9:30 AM – 10:00 AM; F 9:45 AM – 10:45 AM; or by appointment.		
TELEPHONE:	236-9283	EMAIL:	ktakayam@hawaii.edu
EFFECTIVE DATE:	Spring 2016		

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College offers innovative programs in the arts and sciences and opportunities to gain knowledge and understanding of Hawai‘i and its unique heritage. With a special commitment to support the access and educational needs of Native Hawaiians, we provide O‘ahu’s Ko‘olau region and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

Disabilities Accommodation Statement

If you have a physical, sensory, health, cognitive, or mental health disability that could limit your ability to fully participate in this class, you are encouraged to contact the Disability Specialist Counselor to discuss reasonable accommodations that will help you succeed in this class. Ann Lemke can be reached at 235-7448, lemke@hawaii.edu, or you may stop by Hale `Akoakoa 213 for more information.

CATALOG DESCRIPTION

Math 112 is the second of a two-course sequence designed to give prospective elementary education majors the depth of understanding necessary to teach mathematics in the elementary classroom. Topics include the representation of and operations on the natural numbers and properties of those operations. Emphasis will be on communication, connections and problem solving, representations and reasoning.

STUDENT LEARNING OUTCOMES

The student learning outcomes for the course are:

1. Communicate about arithmetic operations using set theory and counting in written and/or oral form.
2. Explain the relationship between addition and subtraction; and between multiplication and division.
3. Represent operations of addition and multiplication using translations along a line and composition of translations.
4. Interpret new functions created by magnification and reflection.
5. Discuss primes and their relationship to composite numbers.
6. Interpret a rational number as a ratio when connected to probabilities, or as a rate such as speed and averages.
7. Use dimensional analysis to help solve a problem.
8. Define an irrational number and explain the significance of specific irrational numbers such as pi.

FOUNDATION HALLMARKS

Math 112 fulfills 3 credits of the General Education requirements (Foundations: Symbolic) for both an A.A. degree at WCC and a Bachelor's degree at UH Manoa. Consequently, it meets the following hallmarks of the symbolic reasoning requirement

1. Students will be exposed to the beauty, power, clarity and precision of formal systems.
2. Instructors will help students understand the concept of proof as a chain of inferences.
3. Instructors will teach students how to apply formal rules or algorithms.
4. Students will be required to use appropriate symbolic techniques in the context of problem solving, and in the presentation and critical evaluation of evidence.
5. The course will not focus solely on computational skills.
6. Instructors will build a bridge from theory to practice and show students how to traverse this bridge.

COURSE CONTENT

Concepts or Topics

- **Pairing**
- **Number of Elements in a Set**
- **Equivalent Sets**
- **Less Than or Greater Than**
- **Infinite Sets**
- **Addition**
- **Subtraction**
- **Prime Numbers**
- **Transformations**

Skills or Competencies/Responsibilities of Students. Success in this course will be enhanced by:

1. a positive, inquiring attitude towards learning mathematics;
2. setting aside adequate time for studying and working of problems;
3. seeking assistance from the instructor and the Math Lab personnel whenever necessary;
4. completing assignments by the designated date;
5. regular class attendance, participation and maintaining accurate class notes.

COURSE TASKS

The mode of instruction is primarily discussion-problem solving where the initial portion of each class period may be utilized to discuss and clarify any questions from the preceding class meeting and/or assignment, and the remaining portion is used to discuss new material. Lectures, directed student explorations, group work, appropriate technologies, and projects will also be used as appropriate.

ASSESSMENT TASKS AND GRADING

The student will demonstrate competency in the objectives by participating in and completing all class activities, by completing and turning in all assignments as requested, by taking unit tests, and by taking a final exam over concepts and skill covered in the entire course. Class activities, unit tests, and the final exam are to be taken in the classroom and without any references unless otherwise stipulated by the instructor.

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

Points will be assigned to each graded assignment, class activity, and tests as follows:

1. **Homework.** Homework sets will be graded on a 0 - 10 point scale. Assignments are to be turned in at the designated date. *Late homework will not be accepted.*
2. **Weekly Quiz.** Weekly quizzes will be graded on a 0 - 5 point scale and will take place at the last meeting of every week. There is no make-up for a missed weekly quiz. Students must be present in class to participate.
3. **Unit Exam.** Unit exams are given in class. A unit exam will be approximately 60 minutes in length and will be scored on a 100-point scale. There is no retest.
4. **Final Exam.** The final exam will cover the concepts and skills in the entire course. The final exam is one hour, fifty minutes in length and will be scored on a 200-point scale. There is no retest. There is no make-up.

Make-up. Make-up opportunity for a chapter test will be possible only upon a timely presentation of a serious and justified explanation of the student's absence from the class test. The instructor has the right to request documentation of the student's absence from the class and to determine if the absence from the class test is justified. A make-up test must be taken within one week of the in-class test unless otherwise specified by the instructor. **No more than one test may be taken by a student on a make-up basis.**

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

GRADE	DEFINITION
A	90% - 100% of the total possible points
B	80% - 89% of the total possible points
C	70% - 79% of the total possible points
Cr	70% - 100% of the total possible points

NC	Less than 70% of the total possible points
D	60% - 69% of the total possible points
F	Less than 60% of the total possible points

Note: Students must apply for the Cr/NC grading option at the Admissions Office. Consult the WCC Catalog for deadlines.

Note: W grade is given only when the student officially withdraws from the course at the Admissions Office. Consult the WCC Catalog for deadlines.

LEARNING RESOURCES

Required Text: *A Problem Solving Approach to Mathematics for Elementary School Teachers* by Billstein, Libeskind and Lott, Pearson, 11th edition.

TRiO Computer Lab and other activities as needed.

The Math Center: Mana`o pono 103

The Math Lab: La`akea 220

UH Manoa Online Learning Academy: manoa.hawaii.edu/ola/

Additional Information

1. **Grading on Homework, Class Activities, Weekly Quizzes, or Tests.** To receive full marks for problems done on any graded activity, you must show your work neatly and completely as well as provide clear written explanations when it is asked for. Partial credit may be awarded.

2. **Absences.** It is your responsibility to attend every class meeting. Even if you are absent, you are responsible for those topics and examples covered in class that you missed. Furthermore, you are responsible for obtaining any important announcements and assignments given during the class you missed. If you are absent frequently or for an extended period of time, contact the instructor as soon as possible to discuss your situation. Absences and tardiness to class will have a negative impact on your success and overall grade in this course.

3. **Homework.** For each chapter, as you read through each section, it is recommended that you write down the words, phrase or math symbols and their meanings, formulas, and properties/rules that are important for each section. It is important for you to know these.

After reading through each section carefully, try the suggested odd numbered problems in each section. The answers to the odd numbered problems are available at the back of the textbook. Do as many as you feel is necessary to help you learn and understand the material and become comfortable with the concepts and/or properties. If you have difficulty solving problems in the section, review the material in the text and your class notes. Many examples are solved. Review the solutions to these problems. If, after checking these sources and trying to find your mistakes, you are still unable to solve a problem correctly, make a note of the exercise number so that you can ask someone for help with that problem.

Mathematics is not a spectator sport. To succeed in mathematics, you must do problems. It is often necessary to practice a skill more than the instructor requires. For example, a textbook may provide 50 practice problems in a section and the instructor may assign only 25 of them. However, some students may need to do 30, 40, or all problems. If you are an accomplished

athlete, musician, or dancer, you know that long hours of practice are necessary to acquire a skill. Do not cheat yourself of the practice you need to develop skills taught in this course.

4. **Laulima.** The syllabus, course calendar, homework schedule, grades, etc. are all viewable through Laulima. Check Laulima regularly to stay up to date.

5. **Communication.** It is your responsibility to stay in communication with the instructor. If you will be unable to make it to class for any reason, please inform your instructor so it may be determined if the absence is excused. The instructor may need to contact you throughout the semester and will do so via email. It is your responsibility to check your student email on a regular basis.