Math 103 – College Algebra
4 credits

Section 60340       MWF 1:00 pm – 2:15 pm       Mana 101

INSTRUCTOR:        Clayton K. Akatsuka, Professor, Mathematics
OFFICE:            Mana 112
OFFICE HOURS:      MW 9:45 am - 10:45 am, 2:15 pm – 2:45 pm;
                    TTh 2:15 pm - 2:45 pm;
                    or by appointments.
TELEPHONE:         236-9279
e-mail:            akatsuka@hawaii.edu
EFFECTIVE DATE:    FALL 2015

WINDWARD COMMUNITY COLLEGE MISSION STATEMENT

Windward Community College is committed to excellence in the liberal arts and career
development; we support and challenge individuals to develop skills, fulfill their potential, enrich
their lives, and become contributing, culturally aware members of our community.

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, or visit http://windward.hawaii.edu/Disabilities/

CATALOG DESCRIPTION

Linear equations, inequalities, systems of equations, polynomials, functions, fractional expressions
and equations, exponents, powers, roots, quadratic equations and functions; rational, exponential
and logarithmic functions.

Pre-requisite: Grade of “C” or better in Math 25, Math 29 or equivalent, satisfactory math
placement test score, or consent of instructor.

WCC: FS
STUDENT LEARNING OUTCOMES

The student learning outcomes are:
1. Demonstrate proficiency in writing math expressions into different forms.
2. Employ algebraic techniques to find the solutions to equations and/or inequalities using complex numbers where appropriate.
3. Use algebraic techniques to analyze and solve applied problems.
4. Interpret equations geometrically and use geometrical information to obtain the equation of lines and circles.
5. Utilize introductory function concepts and draw the graphs of selected functions.
6. Utilize the definition of a logarithm and the properties of logarithms to simplify expressions or to solve logarithmic and exponential equations.
7. Demonstrate proficiency in solving systems of linear and second degree equations and inequalities.
8. Utilize precise mathematical language and symbols to effectively communicate mathematics in written and/or oral form.

Note: All SLO assessments are embedded in class activities, homework, quizzes, or exams.

FOUNDATION HALLMARKS

Math 103 fulfills 3 credits of the General Education requirements (Foundations: Symbolic) for an A.A. degree at WCC. Consequently, it meets the 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 rule 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

- A Review of Basic Algebra
- Equations and Inequalities
- The Rectangular Coordinate System and Graphs of Equations
- Functions
- Exponential and Logarithmic Functions
- Linear Systems
- Conic Sections and Quadratic Systems

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. Reading the text carefully and making use of other learning materials whenever necessary;
4. Seeking assistance from the instructor, the Math Lab personnel, Supplemental Instruction(SI) Leader, or online resources whenever necessary;
5. Completing assignments by the designated date;
6. Regular class attendance, participation and maintaining accurate class notes.
COURSE TASKS

The mode of instruction is primarily lecture-discussion-class activities 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. It is strongly recommended that students read sections prior to each class meeting. After the completion of each unit of instruction, a review and an exam will be conducted. 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, completing and turning in all assignments, class activities, and special projects requested, by taking unit exams and quizzes, and by taking a comprehensive final exam.

It is 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.

Points will be assigned to each assignment, activity, quiz and exam that counts toward the student’s grade as follows:

1. **Homework.** Homework sets will be graded on a 0 – 3 point scale. Assignments are due at the next class meeting. Work must be shown neatly and completely. Late homework will be accepted with penalty – less one point per day late.

2. **Class Activity.** Class activities are done in class and will be graded on a 0 – 2 point scale. There is no make-up for a missed class activity. Students must be present in class to participate. Completed class activities must be turned in no later than the next class meeting. Failure to do so will result in a score of 0.

3. **Unit Exam.** There are four unit exams given in class. A unit exam will be approximately 75 minutes in length and will be scored on a 100 point scale. There is no retest.

4. **Make-up Policy.** If you are unable to attend class on an exam day, discuss your situation with the instructor as soon as possible before the exam day. It may be possible for you to take the exam earlier than the specified day/time. If you unexpectedly must be absent on an exam day, notify me by 4:00 pm via e-mail or voicemail. If the notification is received and the reason is justified then a make-up exam will be scheduled. The instructor reserves the right to request documentation to determine whether the absence is justifiable. For each student, NO MORE THAN ONE make-up exam may be taken.

5. **Final Exam.** The final exam will cover the concepts and skills in the entire course. The final exam is 2 hours in length and will be scored on a 200 point scale. There is no retest. There is no make-up.

6. **Calculators.** Calculator use is NOT allowed on exams.
Each letter grade for the course will be assigned according to the level of achievement as provided in the table below:

**Letter Grade**
- A earns 90% - 100% of the cumulative points possible.
- B earns 80% - 89% of the cumulative points possible.
- C earns 70% - 79% of the cumulative points possible.
- Cr* earns 70% - 100% of the cumulative points possible.
- D earns 60% - 69% of the cumulative points possible.
- NC* earns less than 70% of the cumulative points possible.
- F earns less than 60% of the cumulative points possible.

*Note: Students must apply for the Cr/NC grading option at the Admissions Office. Check your Schedule of Classes for deadline.

**LEARNING RESOURCES**

**Required materials:**
- Textbook: *College Algebra Essentials*, by Julie Miller
  - Although not required, a Student Solution Manual is also available.

**Learning Resources:**
- Supplemental Instruction Leader: TBA
- Testing Center: La`akea (Library Learning Commons) Room 228
  - Phone number: 235-7498
- WCC Math Lab: La`akea (Library Learning Commons) Room 222
  - [http://windward.hawaii.edu/Math_Lab/](http://windward.hawaii.edu/Math_Lab/)
- Brainfuse Online Tutoring: [http://windward.hawaii.edu/brainfuse/](http://windward.hawaii.edu/brainfuse/)
- Kahn Academy Videos: [http://www.khanacademy.org](http://www.khanacademy.org)

**Additional Information**

1. Grading on homework, class activity, quiz or exam. To receive full marks for problems done on any graded activity, you must show your work neatly and completely. Partial credit may be awarded.

2. Absences. It is your responsibility to attend class. Even if you are absent, you are responsible for those topics and examples covered in the class that you missed. Furthermore, you are responsible for obtaining any important announcements and assignments given during the class that 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. Absence and tardiness to class can have a negative impact on your success in this course. Frequent or long periods of absence require a professional note justifying the absence.
# Tentative Schedule - Fall 2015

## Math 103 (CRN 60340)

**College Algebra**  
MWF 1:00 pm - 2:15 pm  
Mana 101

Instructor: Clayton K. Akatsuka  
Office: Manoa 112  
Office Phone: 236-9279  
e-mail: akatsuka@hawaii.edu

<table>
<thead>
<tr>
<th>Important Dates</th>
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<tbody>
<tr>
<td>Aug 28</td>
<td>Last day to register/add/drop and to receive 100% refund of tuition</td>
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<tr>
<td>Sept 14</td>
<td>Last day for 50% refund of tuition and to withdraw without a “W” grade</td>
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<tr>
<td>Oct 30</td>
<td>Last day to withdraw with a “W” grade or choose CR/NC grade option</td>
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<tr>
<th>Date</th>
<th>Monday</th>
<th>Wednesday</th>
<th>Friday</th>
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<tr>
<td>Aug</td>
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| 24           | In Class:  
|              | • Introduction  
|              | • R.1 Sets and the Real Number Line |
|              | Assignment:  
|              | R.1 Read pp. 2-13  
|              | Do pp. 14-16 #41-115 odds, 137-140 |
| 26           | In Class:  
|              | • Review/Collect HMK  
|              | • R.3 Integer Exponents & Scientific Notation |
|              | Assignment:  
|              | R.3 Read pp. 27-35  
|              | Do pp. 36-38 #15, 20, 25, 31, 43, 47, 49, 61, 69, 71, 73, 81, 83, 93, 96, 97-105 odds |
| 28           | In Class:  
|              | • Review/Collect HMK  
|              | • R.4 Rational Exponents & Radicals |
|              | Assignment:  
|              | R.4 Read pp. 39-49  
|              | Do pp. 49-51 #1, 20, 26, 29, 36, 40, 43, 54, 55, 57, 58, 71, 81, 87, 90, 96, 97-105 odds |
| Aug/Sept     | 31      |           |        |
|              | In Class:  
|              | • Review/Collect HMK  
|              | • R.5 Polynomials & Multiplication of Radicals |
|              | Assignment:  
|              | R.5 Read pp. 53-60  
|              | Do pp. 61-63 #23-37 odds, 43, 49, 53, 73, 79, 88, 97, 103 |
| 2            | In Class:  
|              | • Review/Collect HMK  
|              | • R.6 Factoring |
|              | Assignment:  
|              | R.6 Read pp. 65-74  
|              | Do pp. 74-75 #15, 19, 27, 34, 41, 52, 55, 63, 68, 76, 81, 85, 89, 91 |
| 4            | In Class:  
|              | • Review/Collect HMK  
|              | • R.7 Rational Expressions & More Operations on Radicals |
|              | Assignment:  
|              | R.7 Read pp. 76-86  
|              | Do pp. 87-91 #17, 21, 23, 26, 27, 34, 35-41 odds, 49, 51, 58, 61, 65, 66, 67, 69, 76, 84, 89, 105, 115, 123, 131, 132 |
| Sept         | 7       |           |        |
|              | Holiday  
|              | Labor Day |
| 9            | In Class:  
|              | • Review/Collect HMK  
|              | • 1.1 Linear Equations & Rational Equations |
|              | Assignment:  
|              | 1.1 Read pp. 100-108  
|              | Do pp. 109-111 #19, 31, 37, 43-47 odds, 51, 59, 63, 66, 81, 88 |
| 11           | In Class:  
|              | • Review/Collect HMK  
|              | • 1.2 Apps & Modeling with Linear Equations |
|              | Assignment:  
|              | 1.2 Read pp. 113-120  
<p>|              | Do pp. 120-124 #17, 27, 31, 37, 40, 45, 51, 59, 63, 79 |</p>
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<tr>
<th>Date</th>
<th>Pages</th>
<th>Assignments</th>
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| 14   |       | • Review/Collect HMK  
|      |       | • Review for Exam I (R.1 – 1.2) |
| 16   |       | **Exam I**  
|      |       | **(R.1 – 1.2)** |
| 18   |       | • 1.3 Complex Numbers  
|      |       | Assignment:  
|      |       | 1.3 Read pp. 125-131  
|      |       | Do pp. 132-134 #9-16, 30, 34, 49, 53, 55, 57, 62, 63, 71, 73, 80, 82, 91, 93, 101, 111, 117 |
| 21   |       | • Review/Collect HMK  
|      |       | • 1.4 Quadratic  
|      |       | Equations  
|      |       | Assignment:  
|      |       | 1.4 Read pp. 135-144  
|      |       | Do pp. 145-147 #18, 22, 25, 33, 57, 64, 67, 109, 116, 137, 140 |
| 23   |       | • Review/Collect HMK  
|      |       | • 1.5 Apps of  
|      |       | Quadratic Equations  
|      |       | Assignment:  
|      |       | 1.5 Read pp. 148-154  
|      |       | Do pp. 155-157 #17, 25, 29, 34, 39 |
| 25   |       | • Review/Collect HMK  
|      |       | • 1.6 More Equations  
|      |       | and Apps  
|      |       | Assignment:  
|      |       | 1.6 Read pp. 158-165  
|      |       | Do pp. 166-168 #11, 14, 17, 19, 25, 28, 34, 40, 45, 54, 57, 59, 63, 67 |
| 28   |       | • Review/Collect HMK  
|      |       | • 1.7 Linear  
|      |       | Inequalities &  
|      |       | Compound  
|      |       | Inequalities  
|      |       | Assignment:  
|      |       | 1.7 Read pp. 168-75  
|      |       | Do pp. 175-179 #15, 23, 41, 45, 53, 59, 61, 72 |
| 30   |       | • Review/Collect HMK  
|      |       | • 1.8 Absolute Value  
|      |       | Equations and  
|      |       | Inequalities  
|      |       | Assignment:  
|      |       | 1.8 Read pp. 179-184  
|      |       | Do pp. 184-186 #20, 23, 26, 35, 44, 46, 55, 61, 69 |
| 4     |       | • Review/Collect HMK  
|      |       | • 2.1 Rectangular  
|      |       | Coordinate System  
|      |       | Assignment:  
|      |       | 2.1 Read pp. 196-202  
|      |       | Do pp. 203-205 #11, 17, 20, 22, 31-34, 56, 65, 71 |
| 5     |       | • Review/Collect HMK  
|      |       | • 2.2 Circles  
|      |       | Assignment:  
|      |       | 2.2 Read pp. 208-210  
|      |       | Do pp. 212-213 #15, 17, 20, 25, 29, 31, 35, 43, 46, 48 |
| 7     |       | • Review/Collect HMK  
|      |       | • Review for Exam II  
|      |       | (Sections 1.3 – 2.2)  
| 9     |       | **Exam II**  
|      |       | *(Sections 1.3 – 2.2)*  
| 12    |       | • 2.3 Functions &  
|       |       | Relations  
|       |       | Assignment:  
|       |       | 2.3 Read pp. 214-222  
|       |       | Do pp. 222-226 #7-15, 17, 19-41, 44, 56, 57, 61-68, 73, 76, 87, 91, 98, 105, 109 |
| 14    |       | • 2.4 Linear Equations  
|       |       | in Two Variables &  
|       |       | Linear Functions  
|       |       | Assignment:  
|       |       | 2.4 Read pp. 228-238  
| 16    |       | • Review/Collect HMK  
|       |       | • 2.5 Apps of Linear  
|       |       | Equations & Modeling  
|       |       | Assignment:  
|       |       | 2.5 Read pp. 244-253  
|       |       | Do pp. 254-256 #17, 23, 25, 29, 33, 34, 35, 37, 41, 45, 53, 57, 63 |
| Oct 19 | In Class:  
|---|---|
| • Review/Collect HMK  
• 2.8 Algebra of Functions & Composition | Assignment:  
2.8 Read pp. 295-302  
Do pp. 303-305 #15-24, 37, 39, 48, 51-63, 89, 93-100 |
| Oct 21 | In Class:  
|---|---|
| • Review/Collect HMK  
• 3.1 Quadratic Functions & Apps | Assignment:  
3.1 Read pp. 320-326  
Do pp. 329-330 #23, 25, 27, 29, 35, 40, 41, 43 |
| Oct 23 | In Class:  
|---|---|
| • Review/Collect HMK  
• 3.3 Division of Polynomials  
• 3.5 Intro to Rational Functions | Assignment:  
3.3 Read pp. 348-350  
Do pp. 357-358 #17, 19, 23, 27;  
3.5 (I) Read pp. 377-379  
Do pp. 393 #23, 25 |
| Oct 26 | In Class:  
|---|---|
| • Review/Collect HMK  
• 3.5 Rational Functions | Assignment:  
3.5 Read pp. 377-392  
Do pp. 394-395 #65, 67, 71, 75, 81 |
| Oct 28 | In Class:  
|---|---|
| • Review/Collect HMK  
• 3.6 Polynomial & Rational Inequalities | Assignment:  
3.6 Read pp. 399-407  
Do pp. 407-410 #11, 13, 18, 27, 51, 55, 57, 63, 69, 81 |
| Oct 30 | In Class:  
|---|---|
| • Review/Collect HMK  
• 3.7 Variations | Assignment:  
3.7 Read pp. 413-417  
Do pp. 418-419 #29, 32, 39, 44 |
| Nov 2 | In Class:  
|---|---|
| • Review/Collect HMK  
• Review for Exam III (Sections 2.3 – 3.7) |  
| | **Exam III**  
(Sections 2.3 – 3.7) |
| Nov 4 | In Class:  
|---|---|
| • Review/Collect HMK  
• 4.2 Exponential Function  
• 4.3 Logarithmic Function (I) | Assignment:  
4.2 Read pp. 444-450  
Do p. 454 #25, 27;  
4.3(I) Read pp. 458-461  
Do pp. 468-469 #19, 23, 26, 27, 29, 33, 68, 71 |
| Nov 9 | In Class:  
|---|---|
| • Review/Collect HMK  
• 4.3 Logarithmic Function (II) | Assignment:  
4.3(Ii) Read pp. 460-467  
Do p. 469 #35-53 odds, 59-67 odds |
| Nov 11 | In Class:  
|---|---|
| Holiday  
Veterans’ Day | Assignment:  
6.3 Read pp. 474-478  
Do pp. 481-482 #17-43 odds, 49, 55, 57, 59, 69, 75, 77 |
| Nov 13 | In Class:  
|---|---|
| • 4.4 Properties of Logarithms | Assignment:  
6.3 Read pp. 474-478  
Do pp. 481-482 #17-43 odds, 49, 55, 57, 59, 69, 75, 77 |