Math 103 – College Algebra
4 credits

Section 62022      MWF 1:00 pm – 2:15 pm      Mana 101

INSTRUCTOR:       Clayton K. Akatsuka, Professor, Mathematics
OFFICE:           Mana 112
OFFICE HOURS:     M, W, Th 8:50 am - 9:50 am;
                  T 1:30 pm - 2:30 pm;
                  or by appointments.

TELEPHONE:        236-9279
e-mail:           akatsuka@hawaii.edu

Supplemental Instruction Leader: Tiffany Hayler

EFFECTIVE DATE:  Spring 2018

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. 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:

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>earns 90% - 100% of the cumulative points possible.</td>
</tr>
<tr>
<td>B</td>
<td>earns 80% - 89% of the cumulative points possible.</td>
</tr>
<tr>
<td>C</td>
<td>earns 70% - 79% of the cumulative points possible.</td>
</tr>
<tr>
<td>Cr*</td>
<td>earns 70% - 100% of the cumulative points possible.</td>
</tr>
<tr>
<td>D</td>
<td>earns 60% - 69% of the cumulative points possible.</td>
</tr>
<tr>
<td>NC*</td>
<td>earns less than 70% of the cumulative points possible.</td>
</tr>
<tr>
<td>F</td>
<td>earns less than 60% of the cumulative points possible.</td>
</tr>
</tbody>
</table>

*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 Sessions - 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 - Spring 2018

**Math 103  College Algebra**  
Office: Manao 112, Office Phone: 236-9279  
Instructor: Clayton K. Akatsuka  
e-mail: akatsukaihawaii.edu

## Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 12</td>
<td>Last day to register/add/drop and to receive 100% refund of tuition</td>
<td></td>
</tr>
<tr>
<td>Feb 1</td>
<td>Last day for 50% refund of tuition and to withdraw without a “W” grade</td>
<td></td>
</tr>
<tr>
<td>Apr 2</td>
<td>Last day to withdraw with a “W” grade or choose CR/NC grade option</td>
<td></td>
</tr>
</tbody>
</table>

| Jan 8 | Monday | In Class:  
• Introduction  
• Review of Pre-Requisites #1  
Assignment:  
Do pp. 49-51 #20, 26, 29, 36, 40, 43, 54, 57, 58, 71, 81, 87, 97, 99, 101. | 26 |
| 10 | Wednesday | In Class:  
• Review/Collect HMK  
• Review of Pre-Requisites #2  
Assignment:  
Do pp.61-63 #29, 35, 43,49, 53, 73, 79, 88, 97, 103; and pp.74-75 #15,19, 27, 34, 52, 55, 63, 68, 81, 88, 89. |
| 12 | Friday | In Class:  
• Review/Collect HMK  
• Review of Pre-Requisites #3  
Assignment:  
Do pp. 87-91 #17, 26, 34, 39, 41, 51, 56, 58, 65, 69, 76, 84, 89, 105, 115, 123, 132. |

| Jan 15 | Wednesday | Holiday  
Dr. Martin Luther King Jr. Day |  |
| 17 | Wednesday | 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. | 19  
(TPRC – Kauai CC)  
No Class |

| Jan 22 | Monday | In Class:  
• Review/Collect HMK  
• 1.2 Apps & Modeling with Linear Equations  
Assignment:  
1.2 Read pp. 113-120  
Do pp. 120-124 #17, 27, 31,37, 40, 45, 51, 59, 63, 79. | 26 |
| 24 | Monday | In Class:  
• Review/Collect HMK  
• 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. |

<p>| 29 | Monday |  |
| 31 | Monday |  |
| 2 | Monday |  |</p>
<table>
<thead>
<tr>
<th>Date</th>
<th>In Class:</th>
<th>Exam (Review – 1.3)</th>
<th>Assignment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 5</td>
<td>Review/Collect HMK</td>
<td>In Class: Review Exam I results</td>
<td>1.4 Quadratic Equations</td>
</tr>
<tr>
<td></td>
<td>1.5 Apps of Quadratic Equations</td>
<td>1.4 Read pp. 135-144</td>
<td>Do pp. 145-147 #18, 22, 25, 33, 57, 64, 67, 109, 116, 137, 140.</td>
</tr>
<tr>
<td>Feb 7</td>
<td>Review/Collect HMK</td>
<td>Review/Collect HMK</td>
<td>1.7 Linear Inequalities &amp; Compound Inequalities</td>
</tr>
<tr>
<td></td>
<td>1.6 More Equations and Apps</td>
<td>1.6 Read pp. 158-165</td>
<td>Do pp. 166-168 #11, 14, 17, 19, 25, 28, 34, 40, 45, 54, 57, 59, 63, 67.</td>
</tr>
<tr>
<td>Feb 9</td>
<td>Review/Collect HMK</td>
<td>Review/Collect HMK</td>
<td>1.7 Read pp. 168-175</td>
</tr>
<tr>
<td></td>
<td>1.8 Absolute Value Equations and Inequalities</td>
<td>1.8 Read pp. 179-184</td>
<td>Do pp. 184-186 #20, 23, 26, 35, 44, 46, 55, 61, 69.</td>
</tr>
<tr>
<td>Feb 12</td>
<td>Review/Collect HMK</td>
<td>Review/Collect HMK</td>
<td>2.1 Rectangular Coordinate System</td>
</tr>
<tr>
<td></td>
<td>1.8 Absolute Value Equations and Inequalities</td>
<td>2.1 Read pp. 196-202</td>
<td>Do pp. 203-205 #11, 17, 20, 22, 31-34, 56, 65, 71.</td>
</tr>
<tr>
<td>Feb 14</td>
<td>Review/Collect HMK</td>
<td>Review/Collect HMK</td>
<td>2.2 Circles</td>
</tr>
<tr>
<td>Feb 16</td>
<td>Review/Collect HMK</td>
<td>Review/Collect HMK</td>
<td>Exam II Prep</td>
</tr>
<tr>
<td></td>
<td>2.1 Rectangular Coordinate System</td>
<td>Review for Exam II (Sections 1.4 – 2.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.2 Circles</td>
<td>Assignment: pp. 193-194 #12, 17, 22, 23, 29, 33, 36, 37, 38; and pp. 310-311 #2, 6, 11, 13-16.</td>
<td></td>
</tr>
<tr>
<td>Feb 21</td>
<td>Review/Collect HMK</td>
<td>Review/Collect HMK</td>
<td>Exam II Prep</td>
</tr>
<tr>
<td></td>
<td>Review for Exam II (Sections 1.4 – 2.2)</td>
<td>2.2 Circles</td>
<td></td>
</tr>
<tr>
<td>Feb 23</td>
<td>Review/Collect HMK</td>
<td>Review/Collect HMK</td>
<td>Exam II Prep</td>
</tr>
<tr>
<td></td>
<td>Review for Exam II (Sections 1.4 – 2.2)</td>
<td>2.2 Circles</td>
<td></td>
</tr>
<tr>
<td>Day</td>
<td>Details</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mar 5</td>
<td><strong>Exam II</strong> (Sections 1.4 – 2.2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **In Class:** | • Review/Collect HMK  
• 2.4 Linear Equations in Two Variables & Linear Functions |
| **Assignment:** | 2.4 Read pp. 228-238  
| 7 | **In Class:** | • 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. |
| 9 | **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. |
| 12 | **In Class:** | • Review/Collect HMK  
• 3.1 Quadratic Functions & Apps |
| **Assignment:** | 3.1 Read pp. 320-326  
| 14 | **In Class:** | • Review/Collect HMK  
• 3.3 Division of Polynomials  
• 3.5 Intro to Rational Functions (I) |
| **Assignment:** | 3.3 Read pp. 348-350  
| 16 | **In Class:** | • Review/Collect HMK  
• 3.5 Rational Functions |
| **Assignment:** | 3.5 Read pp. 377-392  
| 19 | **In Class:** | • Review/Collect HMK  
• 3.6 Polynomial & Rational Inequalities  
• 3.7 Variations |
| **Assignment:** | 3.6 Read pp. 399-407  
| 21 | **In Class:** | • Review/Collect HMK  
• 3.7 Variations |
| **Assignment:** | 3.7 Read pp. 413-417  
Do pp. 418-419 #29, 32, 39, 44. |
| 23 | **In Class:** | • Review/Collect HMK  
• Review for Exam III (Sections 2.3 – 3.7) |
| **Assignment:** | pp. 315-316 #6-11, 21-28;  
pp. 424-427 #2b-g, 3b-g, 41-44, 49, 57, 60, 63, 65, 74-76. |
<table>
<thead>
<tr>
<th>Date</th>
<th>In Class:</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Review/Collect HMK, Exam III Prep</td>
</tr>
<tr>
<td>28</td>
<td><strong>BREAK</strong></td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

**April**

<table>
<thead>
<tr>
<th>Date</th>
<th>In Class:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Review/Collect HMK, Exam III Prep</td>
</tr>
<tr>
<td>4</td>
<td><strong>Exam III</strong> (Sections 2.3 – 3.7)</td>
</tr>
<tr>
<td>6</td>
<td>Review/Collect HMK, 4.3 Logarithmic Function (I)</td>
</tr>
<tr>
<td>9</td>
<td>Review/Collect HMK, 4.3 Logarithmic Function (II)</td>
</tr>
<tr>
<td>11</td>
<td>Review/Collect HMK, 4.4 Properties of Logarithms</td>
</tr>
<tr>
<td>13</td>
<td>Review/Collect HMK, 4.5 Exponential and Logarithmic Equations</td>
</tr>
<tr>
<td>16</td>
<td>Review/Collect HMK, 5.1 Systems of Linear Equations in Two Variables &amp; Apps</td>
</tr>
<tr>
<td>18</td>
<td>Review/Collect HMK, 5.2 Systems of Linear Equations in Three Variables and Apps</td>
</tr>
<tr>
<td>20</td>
<td>Review/Collect HMK, 5.4 Systems of Nonlinear Equations in Two Variables</td>
</tr>
</tbody>
</table>

**Assignment:**

- **4.2 Exponential Function**
- **4.3 Logarithmic Function (I)**
- **4.3(II) Read** pp. 460-467
  - Do p. 469 #35-53 odds, 59-67 odds.
- **4.4 Read** pp. 474-478
  - Do pp. 481-482 #17-43 odds, 49, 55, 57, 59, 69, 75, 77.
- **5.1 Read** pp. 522-529
  - Do pp. 530-533 #15, 21, 29, 39, 47, 51, 60, 67.
- **5.2 Read** pp. 535-542
  - Do pp. 543-544 #15, 21, 25, 29, 37, 43.
- **5.4 Read** pp. 556-561
<table>
<thead>
<tr>
<th>In Class:</th>
<th>In Class:</th>
<th>In Class:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Review/Collect HMK</td>
<td>• Review/Collect HMK</td>
<td>• Exam IV (4.2 – 5.5)</td>
</tr>
<tr>
<td>• 5.5 Inequalities &amp; Systems of Inequalities in Two Variables</td>
<td>• Review for Exam IV (4.2 – 5.5)</td>
<td>Assignment: Final Exam Review Sheet</td>
</tr>
<tr>
<td>Assignment: 5.5 Read pp. 565-572 Do p. 574 #19, 23, 29, 33, 34, 47, 59, 63.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 30 | 2 (Last Class) | 4 |
| In Class: | In Class: | |
| • Final Exam review | • Final Exam review | |
| Assignment: Final Exam Review Sheet | Assignment: Final Exam Review Sheet | |

<table>
<thead>
<tr>
<th>May</th>
<th>7</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Exam (62267) 10:00 am – 12 noon OR (62022) 1:00 pm – 3:00 pm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>