Math 100: Survey of Mathematics
3 credits (CRN 60119)
TTh 10:00 am – 11:15 am

INSTRUCTOR: Professor Clayton K. Akatsuka
OFFICE: Mana 101
OFFICE HOURS (times students may drop in for help):
TELEPHONE: (808) 236-9279 EMAIL: akatsuka@hawaii.edu
EFFECTIVE DATE: Spring 2019

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 the Ko‘olau region of O‘ahu and beyond with liberal arts, career and lifelong learning in a supportive and challenging environment — inspiring students to excellence.

CATALOG DESCRIPTION

An introduction to quantitative and logical reasoning for the nonscience/nonmathematics major. The question, “What is mathematics?” is explored, while focusing on mathematical systems or models, cultivating an appreciation for mathematics as an aesthetic art, and developing skills in problem solving and analysis. (3 hours lecture)

Pre-Requisite(s): C or better in MATH 25, 26, 28, 29, 75X or higher or equivalent, co-requisite enrollment in Math 78, satisfactory math placement test score, or consent of instructor.

Activities Required at Scheduled Times Other Than Class Times
(1) Homework. (2) Preparation for exams.

STUDENT LEARNING OUTCOMES
As a result of taking this course, students can expect to attain the following outcomes:

1. Utilize basic properties and/or operations related to the topics covered in the course
2. Employ symbolic/mathematical techniques to solve applied problems
3. Utilize precise mathematical language and symbols to effectively communicate mathematics in written and/or oral form
FOUNDATION Symbolic Reasoning HALLMARKS

Math 100 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 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.

FOUNDATION Quantitative Reasoning HALLMARKS

Math 100 also fulfills 3 credits of the General Education requirements (Foundations Quantitative) for both the AA degree at WCC and a Bachelor’s degree at UH Manoa. Consequently, it meets the hallmarks of the quantitative reasoning requirement.

The course will:

1. Provide students with theoretical justifications for, and limitations of, mathematical or statistical methods, and the formulas, tools, or approaches used in the course.
2. Include application of abstract or theoretical ideas and information to the solution of practical quantitative reasoning problems arising in pure and applied research in specific disciplines, professional settings, and/or daily and civic life.
3. Provide opportunities for practice and feedback that are designed to help students evaluate and improve quantitative reasoning skills by including a course component at least once per week with a maximum 30:1 student-to-teaching ratio.
4. Be designed so that students will be able to
   a. Identify and convert relevant quantitative information into various forms such as equations, graphs, diagrams, tables, and/or words;
   b. Select appropriate techniques or formulas, and articulate and evaluate assumptions of the selected approaches;
   c. Apply mathematical tools and perform calculations (including correct manipulation of formulas);
   d. Make judgments, create logical arguments, and/or draw appropriate conclusions based on the quantitative analysis of data, the assumptions made, the limitations of the analysis, and/or the reasonableness of results;
   e. Effectively communicate those results in a variety of formats.
COURSE CONTENT

Concepts or Topics (What students should know or understand)

- Personal Finance: Annuities, Methods of Savings, Investments, Cars, Cost of Home Ownership, Credit Cards. *(FQ)*

- Logic: Statements, compound statements, truth values, truth tables and applications, Euler diagrams and applications *(FS & FQ)*

- Graphs, linear functions, quadratic functions *(FS & FQ)*

- Counting and Probability: Combinations, permutations, Fundamental Counting Principle, odd *(FS & FQ)*

- Statistics: Sampling, graphs, measures of central tendency, measures of dispersion, normal distributions and applications *(FS & FQ)*

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. 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:

*Windward Community College is an equal opportunity, affirmative action institution.*
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 may be accepted with penalty.

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.

3. **Unit Exam.** There are three unit exams and one unit quiz given in class. A unit exam will be approximately 75 minutes in length and will be scored on a 100 point scale, and the unit quiz will be scored on a 50 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.** A basic 5-function calculator is recommended for homework and is necessary for chapters 11 and 12. Calculator use is allowed on some exams. The following is NOT allowed on exams: graphing calculators, iPods, cell phones or any other electronic device not solely designated as a calculator, or sharing of calculators.

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>
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<tbody>
<tr>
<td>A</td>
<td>earns 90% - 100% of the cumulative points possible.</td>
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<tr>
<td>B</td>
<td>earns 80% - 89% of the cumulative points possible.</td>
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<tr>
<td>C</td>
<td>earns 70% - 79% of the cumulative points possible.</td>
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<tr>
<td>Cr</td>
<td>earns 70% - 100% of the cumulative points possible.</td>
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<tr>
<td>D</td>
<td>earns 60% - 69% of the cumulative points possible.</td>
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<tr>
<td>NC</td>
<td>earns less than 70% of the cumulative points possible.</td>
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<tr>
<td>F</td>
<td>earns less than 60% of the cumulative points possible.</td>
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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:**
  Although not required, a Student Solution Manual is also available.
- Basic Calculator: Must have a square root function
Learning Resources:
  o Supplemental Instruction Leader: TBA
  o Testing Center: La`akea (Library Learning Commons) Room 228
    Phone number: 235-7498
    http://windward.hawaii.edu/Testing_Center/index.php
  o WCC Math Lab: La`akea (Library Learning Commons) Room 222
    http://windward.hawaii.edu/Math_Lab/
  o Brainfuse Online Tutoring: http://windward.hawaii.edu/brainfuse/
  o OLA (UH Online Tutoring): http://manoa.hawaii.edu/ola/
  o Kahn Academy Videos: 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.

DISABILITIES ACCOMMODATIONS
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 `Ākoakoa 213
for more information.

TITLE IX
Title IX prohibits discrimination on the basis of sex in education programs and activities that
receive federal financial assistance. Specifically, Title IX prohibits sex discrimination; sexual
harassment and gender-based harassment, including harassment based on actual or perceived
sex, gender, sexual orientation, gender identity, or gender expression; sexual assault; sexual
exploitation; domestic violence; dating violence; and stalking. For more information regarding
your rights under Title IX, please visit: https://windward.hawaii.edu/Title_IX/.

Windward Community College is committed to the pursuit of equal education. If you or
someone you know has experienced sex discrimination or gender-based violence, Windward CC
has resources to support you. To speak with someone confidentially, contact Karla Silva-Park,
Mental Health Counselor, at 808-235-7468 or karlas@hawaii.edu or Kaahu Alo, Designated
Confidential Advocate for Students, at 808-235-7354 or kaahualo@hawaii.edu. To make a
formal report, contact the Title IX Coordinator at 808-235-7393 or wcctix@hawaii.edu.
ACADEMIC INTEGRITY
Work submitted by a student must be the student’s own work. The work of others should be explicitly marked, such as through use of quotes or summarizing with reference to the original author.

Students can upload papers to http://www.TurnItIn.com to have papers checked for authenticity, highlighting where the paper potentially fails to appropriately reference sources.

In this class, students who commit academic dishonesty, cheating or plagiarism will have the following consequence(s):

Students will receive a failing grade for plagiarized assignments.

All cases of academic dishonesty are referred to the Vice Chancellor for Student Affairs.

ALTERNATE CONTACT INFORMATION
If you are unable to contact the instructor, have questions that your instructor cannot answer, or for any other issues, please contact the Academic Affairs Office:

Location: Alakai 121
Phone: 808-235-7422
Email: wccaa@hawaii.edu
## Tentative Schedule – Spring 2019

**Math 100 Intro. to Math Reasoning** (CRN 60119)  
Instructor: Clayton K. Akatsuka  
Office: Manao 112  
e-mail: akatsuka@hawaii.edu

### Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Jan 15</td>
<td>Last day to register/add/drop and to receive 100% refund of tuition</td>
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<tr>
<td>Jan 30</td>
<td>Last day for 50% refund of tuition and to withdraw without a “W” grade</td>
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<tr>
<td>Mar 25</td>
<td>Last day to withdraw with a “W” grade or choose CR/NC grade option</td>
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### Tuesday

<table>
<thead>
<tr>
<th>Jan 8</th>
<th>In Class:</th>
<th>Jan 10</th>
<th>In Class:</th>
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<tbody>
<tr>
<td></td>
<td>• Introduction/Course Overview</td>
<td></td>
<td>• Review/Collect Assignment</td>
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<tr>
<td></td>
<td>• 7.1 Graphing and Functions</td>
<td></td>
<td>• 7.6 Quadratic Functions and</td>
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<td></td>
<td>• 7.2 Linear Functions</td>
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<td>Exponential Functions</td>
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<tr>
<td>Assignment:</td>
<td>7.1 Read pp. 408-417</td>
<td>Assignment:</td>
<td>7.6 Read pp. 462-473</td>
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<td>77, 78, 85; and</td>
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<td></td>
<td>7.2 Read pp. 420-429</td>
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<td></td>
<td>Do pp. 430-432 #8, 12, 16, 17, 19,</td>
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<td>40, 57-59, 63, 65, 66.</td>
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<th>In Class:</th>
<th>Jan 17</th>
<th>In Class:</th>
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<tbody>
<tr>
<td></td>
<td>• Review/Collect Assignment</td>
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<td>• Review/Collect Assignment</td>
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<tr>
<td></td>
<td>• 8.5 Annuities, Methods of Savings,</td>
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<td>• 8.6 Cars</td>
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<tr>
<td></td>
<td>and Investments</td>
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<tr>
<td>Assignment:</td>
<td>8.5 Read pp. 523-535</td>
<td>Assignment:</td>
<td>8.6 Read pp. 539-545</td>
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<tr>
<th>Jan 22</th>
<th>In Class:</th>
<th>Jan 24</th>
<th>In Class:</th>
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<tbody>
<tr>
<td></td>
<td>• Review/Collect Assignment</td>
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<td>• Review/Collect Assignment</td>
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<tr>
<td></td>
<td>• 8.7 The Cost of Home Ownership</td>
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<td>• Review Ch. 7 and Ch. 8</td>
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<td>• 8.8 Credit cards</td>
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<tr>
<td>Assignment:</td>
<td>8.7 Read pp. 548-555</td>
<td>Assignment:</td>
<td>Do: Ch. 7 Test pp.483-485 #2, 5, 6, 7,</td>
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<td></td>
<td>Do: pp. 555-557 #1, 8, 27; and</td>
<td></td>
<td>8, 11, 23, 25; and</td>
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<td></td>
<td>8.8 Read pp. 557-563</td>
<td></td>
<td>Do: Ch. 8 Test pp.572-574 #15, 19-25,</td>
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<td></td>
<td>Do: pp.563-565 #1, 6, 8.</td>
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<td>25, 27.</td>
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<tr>
<th>Jan 29</th>
<th>In Class:</th>
<th>Jan 31</th>
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<tr>
<td></td>
<td>• Collect Assignment</td>
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<td>• Collect Assignment</td>
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<td>• Exam I Prep.</td>
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<tr>
<td>Assignment:</td>
<td>Do: Ch. 7 Test pp.483-485 #2, 5, 6, 7,</td>
<td>Assignment:</td>
<td>Exam I (Ch. 7 and Ch. 8)</td>
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<td></td>
<td>8, 11, 23, 25; and</td>
<td></td>
<td>(Ch. 7 and Ch. 8)</td>
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<tr>
<td></td>
<td>Do: Ch. 8 Test pp.572-574 #15, 19-25,</td>
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<td>Assignment:</td>
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<td></td>
<td>25, 27.</td>
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<td>None</td>
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<td>Date</td>
<td>In Class:</td>
<td>Assignment:</td>
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| Feb 5 | • Review Exam I results  
       • 3.1 Statements, Negations, and Quantified Statements  
       • 3.2 Compound Statements and Connections | 3.1 Read pp. 114-119  
Do pp. 120-121 #1-57, 59-66, 80; and  
3.2 Read pp. 122-131  
| Feb 7 | • Review/Collect Assignment  
       • 3.3 Truths Tables for Negation, Conjunction, and Disjunction | 3.3 Read pp. 135-147  
Do pp. 148-150 #22, 24, 28-30, 42, 45, 49, 53, 55, 57, 81-84, 100. |
| Feb 12| • Review/Collect Assignment  
       • 3.4 Truth Tables for the Conditional and the Biconditional | 3.4 Read pp. 150-158  
Do pp. 159-161 #7, 13, 16, 23, 26, 32-34, 41, 57, 83-86. |
| Feb 14| • Review/Collect Assignment  
       • 3.5 Equivalent Statements  
       • 3.6 Negations; De Morgan's Law | 3.5 Read pp. 162-169  
Do p.170 #3-15 odds, 19, 22, 29, 31; and  
3.6 Read pp. 172-176  
Do pp. 178-179 #3, 5, 9, 15, 22, 26, 29, 38-40, 46, 47, 53, 55-60. |
| Feb 19| • Review/Collect Assignment  
       • 3.7 Arguments and Truth Tables  
       • 3.8 Arguments and Euler Diagrams | 3.7 Read pp. 180-189  
Do pp. 190-192 #3, 9, 15, 21, 27, 33, 39, 42, 45, 51, 59, 63-74; and  
3.8 Read pp. 195-201  
Do pp. 203-204 #5, 10, 15, 20, 25, 30, 35, 37, 47-49. |
| Feb 21| • Review/Collect Assignment  
       • Review for Exam II (Ch 3) | Chapter 3 Test p. 209 #1-29. |
| Feb 26| • Collect Assignment | **EXAM II (Ch 3)**  
Assignment: None |
| Feb 28| • Review Exam II results  
       • 11.1 Fundamental Counting Principle  
       • 11.2 Permutations | 11.1 Read pp. 688-692  
Do pp.693-694 #5, 10,15, 20, 29, 30; and 11.2 Read pp. 694-700  
Do pp. 700-701 #5-55 multiples of five. |
<table>
<thead>
<tr>
<th>Date</th>
<th>In Class:</th>
<th>Assignment:</th>
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</table>
| Mar 5   | • Review/Collect Assignment  
• 11.3 Combinations  
• 11.4 Fundamentals of Probability | 11.3 Read pp. 702-706  
Do pp. 707-708 #1-5, 10, 15, 20, 23, 28,30, 35, 40, 44, 50, 57, 61-68; and  
11.4 Read pp. 709-715  
Do pp. 715-716 #11-20, 27-48, 55-60. |
| Mar 7   | • Review/Collect Assignment  
• 11.5 Probability | 11.5 Read pp. 718-722  
Do pp. 723-724 #1, 4, 5, 7-11, 16. |
| Mar 12  | • Review/Collect Assignment  
• 11.6 Events Involving Not and Or; Odds | 11.6 Read pp. 725-733  
Do pp. 734-735 #1-7, 11, 12, 25-34, 41-48. |
| Mar 14  | • Review/Collect Assignment  
• 11.7 Event Involving And, Conditional Probability | 11.7 Read pp. 737-745  
Do pp. 746-747 #11-22, 49-60 |
| Mar 26  | Holiday  
Kuhio Day |  |
| Mar 28  | • Review/Collect Assignment  
• Review for Exam III (Ch 11) | Chapter 11 Test pp. 762-763  
#1-19, 22-26 |
| Apr 2   | • Review/Collect Assignment  
• Exam III Prep |  |
| Apr 4   | • Collect Assignment  
Exam III (Ch 11) |  |

March 18 – March 22  
Spring Break
<table>
<thead>
<tr>
<th>Date</th>
<th>In Class:</th>
<th>Assignment:</th>
</tr>
</thead>
</table>
| Apr 9 | • Review Exam III results  
• 12.1 Sampling, Frequency Distribution, and Graphs  
• 12.2 Measures of Central Tendency | 12.1 Read pp. 766-775  
Do pp. 776-778 #9-17, 22-29, 31, 33-37; and  
12.2 Read pp. 780-790  
Do pp. 791-793 #5, 10, 15, 20, 25, 30, 40, 43, 50, 52, 54, 62. |
| Apr 11 | • Review/Collect Assignment  
• 12.3 Measures of Dispersion | 12.3 Read pp. 794-799  
Do pp. 800-801 #25, 30, 32, 37. |
| Apr 16 | • Review/Collect Assignment  
• 12.4 Normal Distribution | 12.4 Read pp. 802-812  
| Apr 18 | • Review/Collect Assignment  
• 12.5 Problem Solving with the Normal Distribution | 12.5 Read pp. 816-820  
Do pp. 820-821 #4, 8, 12, 15, 17, 20, 25, 31-36. |
| Apr 23 | • Review/Collect Assignment  
• Review for Quiz (Ch 12) | Chapter 12 Test pp. 837-838 #1-20. |
| Apr 25 | • Collect Assignment  
• Ch. 12 Quiz | Final Exam Review Sheet |
| May 2 | • Review for Final Exam | Final Exam Review Sheet |

**Final Exam**

10:00 am – 12:00 pm