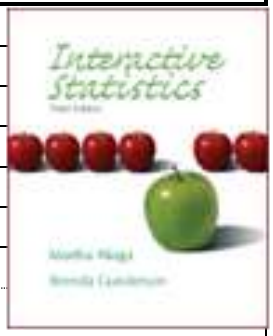
Syllabus for [*name of class here*] **Math 15-E3945** ***Introduction to Statistics*** – College of the Redwoods – Eureka Campus



Semester & Year	Summer 2017	
Course ID and Section #	Math 15-E3945	
Instructor's Name	Tami Matsumoto	
Day/Time	MTWTh 11:00am-1:10pm, 5/22/17-7/13/17	
Location	SC 204, at College of the Redwoods Eureka Campus	
Number of Credits/Units	4 units	
Contact Information	*Office location*	SC 205B, CR Eureka Campus
	Office hours	MW 1:30-2:30 after class, plus by chance and by appointment. Note: Generally, I'll be available before and after each class.
	Phone number	Office: (707) 476-4543
	Email address	tami-matsumoto@redwoods.edu
Textbook Information	*Title & Edition*	***Interactive Statistics***, 3rd Edition
	Author	Aliaga & Gunderson
	ISBN	ISBN-10: 0-13-149756-1; ISBN-13: 978-0-13-149756-6

Course Description

Math 15 Introduction to Statistics

The study of statistical methods as applied to descriptive statistics and inferential statistics. An emphasis on the meaning and use of statistical significance will be central to the course. Students will use probability techniques to make decisions via hypothesis testing and will estimate parameters using confidence intervals. Topics include descriptive statistics; probability and sampling distributions; statistical inference; correlation and linear regression; analysis of variance, chi-square and t-tests; and application of technology for statistical analysis including the interpretation of the relevance of the statistical findings. The course includes applications using data from disciplines including business, social sciences, psychology, life science, health science, and education.

Special Note: A TI-83 or TI--84 graphing calculator is required.

Prerequisite: Math 120, or Math 194, or Math 102

Recommended Preparation: Engl 150 or Engl 102

Student Learning Outcomes

1. Accurately communicate statistical ideas using correct statistical notation, graphs, and vocabulary.

2. Use descriptive and inferential statistics to solve real-world problems.

3. Demonstrate appropriate use of technology in making decisions based upon real-world data.

4. Read and interpret information that contains statistical analysis and be able to communicate these results.

5. Judge the validity of research reported in the mass media and peer reviewed journals.

Special Accommodations

College of the Redwoods complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request at least one week before the first test so that necessary arrangements can be made. No last-minute arrangements or post-test adjustments will be made. If you have a disability or believe you might benefit from disability related services and may need accommodations, please see me or contact Disabled Students Programs and Services. Students may make requests for alternative media by contacting DSPS at 707-476-4280.

Academic Support

Academic support is available at Counseling and Advising and includes academic advising and educational planning, Academic Support Center for tutoring and proctored tests, and Extended Opportunity Programs & Services, for eligible students, with advising, assistance, tutoring, and more.

Math Lab
Drop-in help is available during Math Lab Open Hours (which vary in summer) for students registered in any of the Math Lab courses, such as Math 15L (0.5 unit or 1.0 unit) or Math 252 (0 units).

Academic Honesty

In the academic community, the high value placed on truth implies a corresponding intolerance of scholastic dishonesty. In cases involving academic dishonesty, determination of the grade and of the student's status in the course is left primarily to the discretion of the faculty member. In such cases, where the instructor determines that a student has demonstrated academic dishonesty, the student may receive a failing grade for the assignment and/or exam and may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website at: http://www.redwoods.edu/board/Board-Policies/Chapter-5-Student-Services, and scroll to AP 5500. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the college catalog and on the College of the Redwoods website.

Disruptive Classroom Behavior

Student behavior or speech that disrupts the instructional setting will not be tolerated. Disruptive conduct may include, but is not limited to: unwarranted interruptions; failure to adhere to instructor's directions; vulgar or obscene language; slurs or other forms of intimidation; and physically or verbally abusive behavior. In such cases where the instructor determines that a student has disrupted the educational process a disruptive student may be temporarily removed from class. In addition, he or she may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website at: http://www.redwoods.edu/board/Board-Policies/Chapter-5-Student-Services and scroll to AP 5500. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the college catalog and on the College of the Redwoods website.

Emergency Procedures for the Eureka campus:

Please review the campus evacuation sites, including the closest site to this classroom (posted by the exit of each room). The Eureka **campus emergency map** is available at: (http://www.redwoods.edu/aboutcr/Eureka-Map; choose the evacuation map option). For more information on Public Safety, go to http://www.redwoods.edu/publicsafety. In an emergency that requires an evacuation of the building:

- Be aware of all marked exits from your area and building.
- Once outside, move to the nearest evacuation point outside your building:
- Keep streets and walkways clear for emergency vehicles and personnel.
- Do not leave campus, unless it has been deemed safe by the Incident Commander or campus authorities. (CR's lower parking lot and Tompkins Hill Rd are within the Tsunami Zone.)

RAVE – College of the Redwoods has implemented an emergency alert system. In the event of an emergency on campus you can receive an alert through your personal email and/or phones at your home, office, and cell. Registration is necessary in order to receive emergency alerts. Please go to https://www.GetRave.com/login/Redwoods and use the "Register" button on the top right portion of the registration page to create an account. During the registration process you can elect to add additional information, such as office phone, home phone, cell phone, and personal email. Please use your CR email address as your primary Registration Email. Your CR email address ends with "redwoods.edu." Please contact Public Safety at 707-476-4112 or security@redwoods.edu if you have any questions.

College of the Redwoods is committed to equal opportunity in employment, admission to the college, and in the conduct of all of its programs and activities.

Math 15 Elementary Statistics

The following information is organized in these sections:

1. **About Learning Statistics**
2. **Materials you will need**
3. **Learning Units —** *What material will we cover?*
4. **ASSIGNMENTS —** What exactly do you have to do?
5. **Creating Your Own Personal STATISTICS REFERENCE BOOK**
6. **Homework —** *What, When, Why, How*
7. **Course Grading**

1. About Learning Statistics

To learn statistics, you must learn a lot of new terminology (including "old" vocabulary with new meanings), special symbols, formulas, relationships, and concepts. And that's not all! You also must learn how and when to apply which formulas, and how to interpret your statistical results. It isn't enough to know how to do the algebraic manipulations, or how to find things on your calculator. You will need to learn which are the correct formulas (or statistical tests), that are appropriate to use in a given situation. Also, unlike the majority of your previous math experience, there often is not just one "right" answer. You will need to understand the assumptions behind the different answers and how to assess which you feel is best for a particular case.

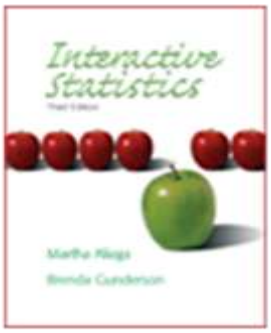
In statistics classes, sometimes students feel like the whole class is full of word problems and sometimes even students with excellent algebraic skills struggle with statistical concepts and interpretations.

On the other hand, some people who have had bad prior experiences with math classes really enjoy the way statistics is much more real and meaningful and applicable to the real world.

You will need to learn (a la Bloom):

- Knowledge
    - Definitions
    - Types of Graphs
    - Different Formulas
    - Main Ideas
- Comprehension
    - How related things compare (similarities, differences)
    - What different things mean or tell us
    - How to interpret summary information
    - How to make predictions based on limited information
- Application
    - How to apply what you know to new situations
    - How to use information (statistics or data, for instance)
    - How to solve problems, using what you have learned
- Analysis
    - How to make inferences from analysis of complex information
    - Recognizing importance and significance of component parts
- Synthesis
    - How to understand a situation and pull together all that you have learned, to construct an appropriate statistical test and make valid conclusions and inferences
- Evaluation
    - How to look back and assess what was done (by you or others) and compare and evaluate the results

2. Materials you will need:



YOU SHOULD HAVE:

- **Required Text**: *Interactive Statistics*, 3rd Edition, by Aliaga & Gunderson. Published by Prentice Hall. 2006.

- **Graphing Calculator**: A TI-83 or TI-84 graphing calculator is required. A limited number are available **for rent** from the Math Lab in the ASC.

- **Bound Notebook with Grid Paper**: Something like Roaring Spring #77475 or Ampad #26-251 (about $2 - $6), for example. It should be **bound** and have **graph paper** in it. You will use this throughout the course to build yourself a reference book.

ALSO:

- **Supplemental Handouts**. There will be a lot of supplementary material. It is your responsibility to make sure that you get and read all supplemental material.

- **Time. Lots!!** In your own weekly schedule it is strongly recommended that you have blocked out 20 to 30 hours *per week* to devote to this class. We cover 15 chapters in less than 8 weeks and the book is about 1000 pages! Note that some people believe summer classes to be easier, but in reality, summer classes go faster and require much more of your time per week. The main advantage can be if you are not taking other classes and not working too much and can concentrate on this one class for 8 weeks, then you can complete this class faster.

- **Paper**: Homework Paper and scratch paper, lots of it! It is fine with me if you RE-USE paper. Paper that's only been used on one side is still fine (in general) on the other side. You will also need some graph paper. Get it in a pad or a package of loose-leaf sheets (rather than stuck in a notebook), or print it from the web. Many people find it helpful to get graph paper with heavier lines on every fifth line to make counting easier.
- **Pencils**: Lots. Math problems should be done in pencil in this class (as in math classes in general). If you like softer lead (I find it writes darker easier) then you might like "2B" mechanical pencil lead (I prefer “2B” to "HB" which I find not as easy to work with).
- **Erasers**: At least one.
- **A ruler**: Important for drawing tables and graphs carefully and correctly.

- **Online Access** for:
  - **Email:** I expect you to have access to a computer and I expect to be able to contact you easily. The College uses your "*mycr.redwoods.edu*" email address to communicate with you so it is important that you receive those email messages anyway. Note that you can set it up to autoforward those emails to another email address if you prefer. Instructions for autoforwarding are available online.
  - **Canvas course management system**. Our "home base" for course materials will be Canvas. (This is separate from your email but you need regular access to this also.)
  - **Other online resources**. We will have other resources online too.

3. Learning Units — *What material will we cover?*

The course material is organized into six Learning Units. Many Units includes two or three Chapters. At the end of each Unit, there will be a Unit Exam and a grade update.

Unit	Chapters and Data Collection Assignment
1	Chapter 1: How to Make Decisions with Statistics (pp 1-52, 62-66) Chapter 4: Summarizing Data Graphically (pp 211-284) Chapter 5: Summarizing Data Numerically (pp 299-333, 344-5) Data Assignment #1: Quantitative Data, 1 variable from 2 related populations; turn in graphs for comparisons and summary statistics for comparisons (will use same data again later in Unit 4) Unit 1 Exam: Monday June 5 (45 minutes)
2	Chapter 6: Using Models to Make Decisions (pp 357-397) Chapter 7: Probability (pp 409-439, 454-470, 478-489) Chapter 2: Sampling Designs (pp 83-135) Data Assignment #2: *Probability* Unit 2 Exam: Tuesday June 13
3	Chapter 8: Sampling Distributions (pp 499-545, 555-7) Chapter 9: Making Decisions About Population Proportions (pp 563-594, 602-7) Chapter 10: Making Decisions About Population Means (pp 613-33, 639-53, 657-8) Data Assignment #3: *Proportion*: Binomial data, 1 categorical variable from 1 population Unit 3 Exam: Tuesday June 20
4	Chapter 3: Observational Studies & Experiments (pp 145-196) Chapter 11: Comparing Two Treatments (pp 669-727) Chapter 12: Comparing Many Treatments (pp 743-761, 791-3) Data Assignment #4: Use same data from Data Assignment #1; use T-Test and Confidence Intervals to compare Unit 4 Exam: Tuesday June 27
5	Chapter 13: Regression Analysis (pp 807-901) Data Assignment #5: Bivariate Quantitative Data, 2 variables from 1 Population Unit 5 Exam: Monday July 3
6	Chapter 14: Analysis of Count Data (pp 921-966) Chapter 15: Nonparametric Statistics (pp 977-1002) Data Assignment #6: look back: assess and evaluate results Unit 6 Exam: Tuesday July 11

Note: **Comprehensive Final Exam** on Units 1-6 on Thursday July 13

4. ASSIGNMENTS — *What exactly do you have to do?*

The course material is organized into six Learning Units. Except Unit 5, each Unit includes more than one Chapter. At the end of each Unit, there will be a Unit Exam.

1. **Attend Class** — For summer, the entire semester course is jammed into a furious ***8*** short weeks. Attendance is extremely important at every class session so you participate and keep up. We cover 15 chapters in 28 days* and it's nearly 1000 pages! That's about 35 pages per day, on average.

2. **Textbook**

   - **Reading** — Read instructions for each Learning Unit carefully — This will tell you which pages to read. This class covers a LOT of information and we go faster during the summer session; it is extremely important that you keep up. There will be a few parts of the textbook that we will skip, but we will cover nearly 140 pages each week.

   - **Homework Exercises** — Read instructions for each assignment carefully — This will tell you which problems are assigned. Doing homework exercises is an important part of the process by which you learn the material. It is recommended that you also work through the examples as you read, and work additional problems besides those assigned. Try to finish the homework before the next class, but if you have questions, you will be allowed to turn in your homework the following class meeting. Homework exercises will be designated in three categories: "Practice Problems" and then Written Problems as "Basic" or "Advanced." Everyone is expected to do all the "Practice Problems." To pass the class, you must do most "Basic" problems but you only need to do "Advanced" problems if you want a grade of "A" or "B" (or A- or B+ or B-) for the course.

3. **Statistics Reference Book** — You will be constructing your own personal "Statistics Reference Book" throughout the course (see "Bound Notebook with Grid Paper" under "Materials you will need"). Follow the separate instructions. There will be some specific directions prescribing some of the contents, and you will also have freedom to include other pertinent information, definitions, examples, notes, that you think will be helpful for you as reference material. ***Create a Reference Book that helps You!***

4. **Quizzes and Exams**
   - **Short Quizzes** — We will have short quizzes often. Some will be online and some will be in class. These quizzes are important for letting us know how you are doing and what needs further work (important for both you and me to know). Some will be "Reference Book Quizzes" – ones where you will be allowed to use your Reference Book (but NOT your text or other notes) to help you with the quiz.
   - **Unit Exams** — There will be six Unit Exams, each approximately 40 minutes, each of which will focus on the material from that Unit.
   - **Final Exam** — Comprehensive Final Exam on the last day of class: Thursday, July 14.

5. **Data Projects** — There will be several short assignments for you to do that involve analyzing data, and turning in written assignments. Details will be provided separately.

6. **Other Assignments** — Other assignments will pertain to reading statistical results in newspaper or magazine articles and interpreting them, or analyzing data given to you, and asking you to think critically. One of the main goals of this course is for you to learn to think critically and analyze statistical claims on a more educated level, so we will practice doing that throughout the course.

*Meeting 4 days/week for 8 weeks should be 32 days, but we have 2 holidays, plus the last week we review for the cumulative Final Exam, which leaves 28 days to cover the material.

5. Creating Your Own Personal STATISTICS REFERENCE BOOK

During the course, you will create your own personal Statistics Reference Book. In your Reference Book, you should write definitions, examples, and instructions of things that you learn in this class. The idea is for you to make your own book that will be useful to you throughout this course, and especially in courses you take after this one!

You will be allowed to use your Reference Book on our "Reference Book Quizzes" as well as when you are studying and working on your homework.

- **Get a bound notebook with grid paper** in it (sometimes called "quad ruled"). Composition books are about $2 to $4 dollars and are sold at the CR bookstore, Staples, and other places.
- **Make a Title Page**. Make the ***first*** page into a title page (use a right-side page). Create a title for your book, and include identifying information so it could be returned to you if you ever lose it.
- **Start the Table of Contents**. On the top of the next page (***right*** side) write "Table of Contents" and reserve *the next several pages* for your Table of Contents to grow into. Skip at least 4 pages – more if your writing is large or if you anticipate entering particularly detailed information in your "T O C."
- **Page 1**. The first page (right side) that you write actual content on should be numbered "1".
- **Number the following pages**. Number the pages, either odd and even on front and back, or you might prefer to number just the right-side pages 1, 2, 3, and so on, leaving the left sides blank.
- **Enter information regularly as you study and do your homework**. Keep one topic on each page, even if you don't fill up every page. The important thing to remember is to make this useful for yourself, so that a year from now (for example), you will be able to find whatever you look for.
- **What to write**: At times, I will direct you to include specific information in your Reference Book. Also, as you study, go over your class notes and read corresponding material in the text, synthesize important information and put it into your Reference Book. Definitions and explanations ***in your own words*** will be easier for you to understand later. Include examples and diagrams/sketches.

Your Reference Book will be graded several times during the term. Correctness will be spot-checked (due to lack of time – not for lack of interest!). The Reference Books are graded on three areas: completeness, general correctness, and presentation.

To get an "A-" or "A" your Statistics Reference Book must have the following:

- Title Page, Table of Contents, excellent up-to-date definitions of terms from each Learning Unit, accompanied by graphs and examples, with appropriate use of color

For a B/B-/B+

- Title Page, Table of Contents, and (more than minimal) definitions of terms from each Learning Unit, with examples

For a C/C-/C+

- Title Page, Table of Contents, and at least minimal definitions of basic terms from each Learning Unit

For a D

- a Statistics Reference Book

If you have no Statistics Reference Book, your grade is an F

6. Homework — *What, When, Why, How?*

There will be homework assignments associated with essentially each class meeting. In general, work to finish your homework before the next class meeting, but if you have questions, you will be allowed to turn in your homework two classes after it is assigned. Since this could result in overlaps of assignments, you must be very careful to keep your assignments labeled clearly, but this system allows you to ask for help, if needed, so that you can then finish up that assignment and still turn it in – and understand it.

The purpose of having you do homework exercises is

(1) to give you practice with a variety of problems, and

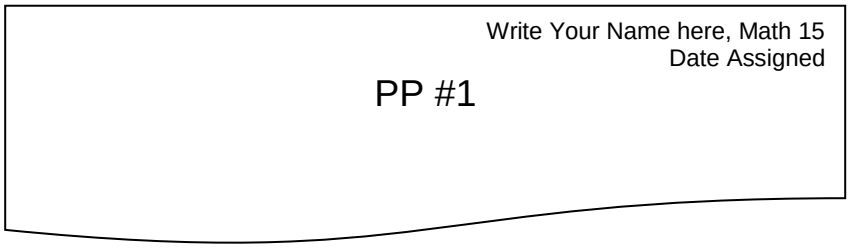
(2) to help you to learn to write responses correctly, and

(3) to help you get some feedback and check comprehension as you go.

I will usually assign problems that have answers in the back of the book so that you can check your work as you go along and get help when you need to. Generally, we will be able to discuss a few problems in class, but if you still have more questions, then please be sure to seek out help, outside of class time.

There will be "Practice Problems" (PP) and two categories of "Written" homework assigned: "Basic" and "Advanced." You must do the "Basic" problems to pass the class, but you only need to do "Advanced" problems if you want a grade of B- or higher. (See grading information sheet.)

Here are some very general instructions for how I want you to do your homework:



1. When you turn in your homework, if there are multiple pages, please make sure they are in the correct order. Also do not run problems into each other – each problem should be clearly marked and easy to find.
2. Label each homework assignment clearly in the center at the top with the assignment number, such as "**PP #1**" (Practice Problems) or "**Basic #1**" or whatever *number* it is.
3. At the top right side of the page, write **your name** and "**Math 15**" and the **date**.
4. Please **use pencil**, and erase carefully, when necessary.
5. Label problems clearly.
   - Label "Practice Problems" and do them all together on the same page(s). These are for practice and it's ok if they look like "scratch" work, but number each problem clearly. For "Practice Problems," it's ok to just turn in the answers, if no written work is needed.
   - Label "Written" problems (Basic and Advanced) and turn them in separately from Practice Problems. For these, ***paraphrase the question*** – you do not need to copy all the words of the question exactly as in the book, but you should write enough so that anyone looking at it (who does not have the book in front of them) can tell what it was that you were supposed to do. Show your work – ***do not just turn in a list of answers***.
6. Work down the page (two columns is OK) – Each problem should be below the previous (**not** next to it).
7. **Check all your answers in the back of the book before** turning it in. It is your responsibility to check your work and get help if and when you have questions.

7. Course Grading (*subject to change with fair notice*)

NOTE: The "Gradebook" in Canvas is NOT your official grade and is for informational purposes only.

	In-class Assignments*	Data Projects	Reference Book	Homework	Exams/Quizzes
For A-/A	At least 90% completed satisfactorily	At least 90% average	Excellent Reference Book, with all or most topics covered, with corresponding table of contents	• Do all Practice Problems • at least 90% of "Basic" problems completed in a legible, satisfactory way; • good work done on majority of "Advanced" problems	At least 85% average
For B-/B/B+	At least 80% completed satisfactorily	At least 80% average	Good Reference Book, covering majority of course content with corresponding table of contents	• Do all Practice Problems • at least 80% of "Basic" problems completed in a legible, satisfactory way; • good work done on at least some "Advanced" problems	At least 75% average
For C-/C/C+	At least 70% completed satisfactorily	At least 70% average	Basic Reference Book has basic topics covered	• Do 70% of Practice Problems • at least 70% of "Basic" problems completed in a legible, satisfactory way	At least 65% average
For D	At least 60% completed satisfactorily	At least 60% average	Reference Book must have at least one page of content	• Do majority of Practice Problems • Majority of "Basic" problems completed in a legible, satisfactory way	At least 50% average

For determination of +/- grades, the entire class spread will be considered at the end of the term.

*regarding in-class work, there can be exceptions if arrangements are made in advance

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CAVEAT: The above procedures are subject to change.