Syllabus for: (name of class)	
Math 15-V4755 (034755) *Elementary Statistics*	
Semester & Year:	Summer 2013
Course ID and Section Number:	Math 15-V4755 (034755)
Number of Credits/Units:	4 units (72 contact hours)
Day/Time:	6/03/2013-8/08/2013 Days TBA, Times TBA
Location:	Room TBA (The class is online.)
Instructor's Name:	Teresa ("Tami") Matsumoto
Contact Information:	Office location and hours: PS 102
	Phone: (707)476-4543
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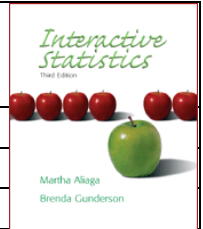
Course Description (catalog description as described in course outline):

MATH-15 Elementary Statistics - (4 units lecture)

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 frequency distributions, graphs, measures of relative standing, measures of central tendency, measures of variability, correlation, and linear regression to explore descriptive statistics. Students will use the laws of probability and statistical tests (t-tests, chi-square, ANOVA, and regression analysis) to make decisions via hypothesis testing and estimate parameters using confidence intervals.

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

Prerequisite: Math 120 or Math 194 with grade of "C" or better

Recommended Preparation: English 150

Student Learning Outcomes (as described in course outline) :

What should the student be able to do as a result of taking this course?

Some objectives in terms of specific, measurable student accomplishments are:

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.

Refer to http://msenux.redwoods.edu/mathdept/outlines/current/math15.php

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.

Academic Misconduct: Cheating, plagiarism, collusion, abuse of resource materials, computer misuse, fabrication or falsification, multiple submissions, complicity in academic misconduct, and/ or bearing false witness will not be tolerated. Violations will be dealt with according to the procedures and sanctions proscribed by the College of the Redwoods. Students caught plagiarizing or cheating on exams will receive an "F" in the course.

The student code of conduct is available on the College of the Redwoods website at:
http://www.redwoods.edu/District/Board/New/Chapter5/Ap5500.pdf

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.

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 just 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 the 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 that particular case.

Some statistics students feel like the whole class is full of word problems and sometimes even students with excellent algebraic skills struggle with the 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
    - What the Different Formulas are
    - 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

Materials you will need:

- **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 Division office PS101.
- **Something like a Bound Notebook with Grid Paper**: 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.
- **Supplemental Handouts**. There will be a lot of supplementary material. It is your responsibility to make sure that you get a copy of all supplemental material, even if you miss class.
- **Time. Lots!!** In your own weekly schedule please make sure that you have blocked out at least 20 to 25 hours per week to devote to this 10-week class. We cover 15 chapters in 10 weeks and it's about 700 pages! Do the math!

- **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.
- **Technology for submitting homework electronically:** Examples include digital camera, smart phone, scanner.

- **Computer Access** for:
    - **Email:** I expect you to have access to a computer and 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; you can set it up to autoforward those emails to another email address if you prefer.
    - **"myCR" course management system**. Our "home base" for course materials will be the "myCR" course system. (This is a separate thing from your email but you need access to a computer for this also.)
    - **Other online resources**. We will have other resources online in addition to "myCR."

How this online course will work:

Learning Units: The course material is divided up into six Learning Units. Each Learning Unit includes textbook material to read, textbook exercises to do, outside reading, discussion forum assignments, and a data project. You will also all contribute to the class wiki in myCR. There is more information below, but, briefly, the six Learning Units are:
- Unit 1: Laying the Foundation and "Framing the House" (Chapters 1, 4, 5)
- Unit 2: Probability in Sampling and Modeling Variables (Chapters 2, 6, 7)
- Unit 3: Sampling Distributions and Making Conclusions about Means and Proportions(Chapters 8, 9, 10)
- Unit 4: Comparing Two or More Populations (Chapters 3, 11, 12)
- Unit 5: Regression Analysis (Chapter 13)
- Unit 6: Categorical and Non-Normal Variables (Chapters 14, 15)

Lessons in myCR: Each Learning Unit is broken up into five or six Lessons which you access in myCR. Each Lesson is intended to have the amount of material that would be covered in approximately 1.5 hours of "instruction" if this were a face-to-face class, along with approximately 3 to 5 hours of corresponding "homework" and related study. There are approximately four Lessons per week. It is ok to work ahead of the schedule, but it is not ok to get behind. Read instructions for each Lesson carefully — This will tell you which pages to read. This class covers a LOT of information and since we only meet twice a week each session covers a lot; 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 about 75 pages each week.

Homework: Each Lesson has a homework assignment associated with it. The homework assignments will be listed in the Lesson information in myCR.

Turning in Assignments: To turn in assignments, one option is to create them electronically and submit them into the DropBox in myCR. Another option is to submit scanned copies into the myCR DropBox. A third option is to submit an electronic photo file (.jpg) of your work.

Quizzes and Exams: Each Learning Unit will have a Unit Exam. Some will be untimed ("take-home") and some will be timed (1 hour). There will also be occasional short quizzes for you to complete. More details will follow.

Participation: Participation in and attending to class activities are essential to the learning process. Furthermore, everyone benefits from your input and participation, including you! One important aspect of this course is the incorporation of active learning in class; this requires everyone's participation, particularly during collaborative activities. Also, the best way to insure having a successful experience in any course is to keep up with the material and do all the assignments.

I realize that sometimes things come up and completing work on time may be impossible. In those cases, just communicate with me as soon as you possibly can. This is especially important if you are missing class on a day we are scheduled to have an exam!

Note that ALL students remain responsible for ALL assignments given and that those assignments are expected to be submitted ON TIME. If you get behind, the assumption is that you will get the necessary information to complete any assignments by their due dates and be prepared to continue in the normal flow of the course.

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**CAUTION: the material builds from one week to the next and so
IT IS STRONGLY URGED THAT ALL STUDENTS STRIVE TO STAY ON TOP OF EVERYTHING.**

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Problem Sets, assigned from the textbook: Problems will be assigned from the textbook. There will be "Basic" problems and "Advanced" problems. If you are not aiming for a course grade of "B" or "A" then you do not need to do the "Advanced" problems – some of which are genuinely more difficult, and others of which are merely time-consuming. I recognize that most people have other things in their lives besides this one class, and that sometimes life gets in the way of devoting all of your energy to one class, and at times, it is all a person can do just to pass, and this is why there are "Basic" and "Advanced" problems (see also the grading information).

Show your work, and work neatly and legibly. There will not be time for every problem to be graded carefully, so it is very important that you check your own work before turning it in, and ask questions if you want to make sure you are on the right track.

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.

Other assignments: There will be assignments other than problems from the book. These will be explained, but I want you to be aware that there is more to "homework" than just problems in the book.

Reference Book: Each student is required create his/her own personal Statistics Reference Book throughout the term. It should be made in a bound notebook. It should have a title page at the front, followed by a table of contents. The contents should include material learned in the course. For the most part, it is up to you to decide exactly what to include, though there will be a few items I will direct you to be sure to include. Each page should be its own separate topic. Each week or so I will ask for photos of whatever you have in your Reference Book so far.

Exams: There will be an exam after each learning unit and a Final Exam during Finals Week. Each of the tests amid the term will cover material since the previous test. The Final Exam will be comprehensive and will be given in parts so that you do not have to do it all in one sitting. You do not need a scantron for any of these tests.

Final exam date: <u>Thursday August 8, 2013.</u> The Final Exam will be available and is to be completed on that date.

HELP?!   If you have questions, please get help! It is ***your*** responsibility to seek help if you need it. I will answer some questions in class, but unfortunately, we will not have enough time to answer all of everyone's questions.

DUE DATES and LATE WORK: Caveat on "due dates": While we are, by necessity, confined within a certain time framework, it is important to me that you understand the material – given that, if you have made progress on an assignment but are having trouble completing it by the due date, communicate with me to make appropriate arrangements.

<u>**Recommendation**</u>: Sign up for The Math Lab (**Math 52**) for virtually-free drop-in tutoring at CR's Eureka campus. Register for either the 0.5 unit or the 1.0 unit section. You can attend any time during Math Lab Open Hours: M-Th 8:15-1:15. The Eureka Math Lab is in the ASC in the LRC.

Math 15 Learning Units — *What material will we cover?*

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

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). *See detailed instructions before starting. Three possible ideas will be due June 5, with the final work due June 13.* Unit 1 Exam: Tuesday, June 11
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: Bivariate Quantitative Data, 2 variables from 1 Population (Due June 24) Unit 2 Exam: Thursday June 20
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 (Due July 3) Unit 3 Exam: Tuesday July 2
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 (Due July 10) Unit 4 Exam: Thursday July 11
5	Chapter 13: Regression Analysis (pp 807-901) Data Assignment #5: Use bivariate data set from previous data collection (Due July 22) Unit 5 Exam: Tuesday July 23
6	Chapter 14: Analysis of Count Data (pp 921-966) Chapter 15: Nonparametric Statistics (pp 977-1002) Data Assignment #6: Multinomial Data (Categorical), 1 categorical variable from 1 population (Due July 31) Unit 6 Exam: Thursday August 1

Note: Comprehensive Final Exam on Units 1-6 on Thursday August 8.

Math 15 GRADING CRITERIA – *What do you have to do to earn an "A" (or just to pass the class)?*

To pass the class (i.e., not get an "F"), all the following requirements must be met:

- Homework Exercises assigned from the textbook:
    - complete a majority of the "basic" exercises assigned, in a legible, satisfactory way
- Create your own Statistics Reference Book
- Quizzes and Exams –at least 60% correct
- Data Projects – complete a majority of assignments
- Other Assignments – complete a majority of assignments

To get at least a "C-" you must do all of the following:

- Homework Exercises assigned from the textbook:
    - complete at least 80% of the "basic" exercises assigned, in a legible, satisfactory way
- Create your own Statistics Reference Book with at least basic content from the course
- Quizzes and Exams –at least 65% correct
- Data Projects – at least two-thirds
- Other Assignments – at least two-thirds

To get at least a "B-" you must do all of the following:

- Homework Exercises assigned from the textbook:
    - complete all the "basic" exercises assigned, in a legible, satisfactory way
    - work on at least one-fourth of the "advanced" exercises
- Create your own Statistics Reference Book with a Title Page, Table of Contents, and (more than minimal) definitions of terms from each Learning Unit
- Quizzes and Exams –at least 75% correct
- Data Projects – at least 80%
- Other Assignments – at least 80%

To get at least an "A-" you must do all of the following:

- Homework Exercises assigned from the textbook:
    - complete all the "basic" exercises assigned, in a legible, satisfactory way
    - work on more than half of the "advanced" exercises
- Create your own excellent Statistics Reference Book with a Title Page, and Table of Contents, including up-to-date definitions of terms from each Learning Unit, with color, accompanied by graphs and examples.
- Quizzes and Exams –at least 85% correct
- Data Projects – at least 90%
- Other Assignments – at least 90%

CAVEAT:	The above procedures are subject to change.