Syllabus for linked classes Math 15 "Introduction to Statistics"/Math 15s "Support for Statistics"

Course Information

Semester & Year:	Fall 2019	
Course ID & Section #:	**Math 15 E7268 "*Introduction to Statistics*"**	**Math 15s E8403 "*Support for Statistics*"**
Instructor's name:	Tami Matsumoto	
Day/Time:	TTh 1:15pm - 3:20pm	TTh 3:30pm - 4:55pm
Location:	SC Bldg, Room SC204	SC Bldg, Room SC204
Number of units:	4 units	1 unit

THESE ARE LINKED COURSES: Math 15 (E7268) and Math 15s (E8403)

The two courses (Math 15 lecture course and Math 15s Support lab course) are linked. Any student must enroll in both sections together, as identified in Web Advisor. Students may not enroll in one without enrolling in the other, nor may students attend this section of Math 15 (E7268) with *one of the other* Math 15s Support courses – nor vice versa (this Math 15s but a different Math 15). Lack of participation in ***either*** of the courses (Math 15 or Math 15s) may lead to the student being dropped from **both** courses (since they are linked).

Instructor Contact Information

Office location:	SC 205B, behind copier upstairs in SC Bldg
Office hours:	Wed 2:45-3:45; TTh 12:30-1:00. Note: I'll be in MathLab Mondays 3:00-4:30 Also available by chance and by appointment.
Phone number:	Office: (707) 476 – 4543
Email address:	tami-matsumoto@redwoods.edu Note: include "**Math15/15s**" as part of the Subject line
Social Media	https://twitter.com/TamiMathCR, https://www.instagram.com/TamiMathCR/, https://www.facebook.com/TamiMathCR

Required Materials

Textbook Title:	***Interactive Statistics***, 3rd Edition
Edition:	3rd
Author:	Aliaga & Gunderson
ISBN:	ISBN-10: 0-13-149756-1; ISBN-13: 978-0-13-149756-6

Other required materials:

- Book for Math 15s: **Naked Statistics:** *Stripping the Dread from the Data*, by Charles Wheelan
- **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.

Catalog Description

Math 15: An introduction to basic concepts of descriptive and inferential statistics, with emphasis on the meaning and use of statistical significance. Students will use probability techniques to make decisions via hypothesis testing and will estimate parameters using confidence intervals. The course includes applications from a variety of technical and social science fields.	Math 15s: A support course for Math 15, "Introduction to Statistics." Through hands-on activities and group work, students learn skills and explore concepts crucial for success in transfer-level statistics.

Course Student Learning Outcomes *(from course outline of record)*

Math 15:	Math 15s:
1. Accurately communicate statistical ideas using correct statistical notation, graphs, and vocabulary. 2. Use descriptive and inferential statistics to better understand 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.	1. Apply numerical and algebraic techniques to understand and evaluate statistical formulas. 2. Interpret graphs and represent data graphically to support statistical arguments. 3. Implement effective learning strategies.

Evaluation & Grading Policy for Math 15s:

Math 15s is Pass/NoPass. Students must display achievement of outcomes to pass Math 15s.

Evaluation & Grading Policy for Math 15:

Final Course Grade

For "A/A-" you must do all of the following:

- Participate in class with at least 90% of in-class work completed satisfactorily*
- Homework: complete at least 90% of Practice Problems; do 90% of "Basic" problems in a legible, satisfactory way; have good work done on majority of "Advanced" problems.**
- Reference Book: Create your own excellent Statistics Reference Book with Title Page, all or most topics covered with a corresponding Table of Contents.
- Exams/Quizzes: at least 85% average
- Data Projects: at least 90% average

For "B-/B/B+" you must do all of the following:

- Participate in class with at least 80% of in-class work completed satisfactorily*
- Homework: complete at least 85% of Practice Problems; do 80% of "Basic" problems in a legible, satisfactory way; have good work done at least some "Advanced" problems.**
- Reference Book: Create your own good Statistics Reference Book with Title Page, majority of topics covered with a corresponding Table of Contents.
- Exams/Quizzes: at least 75% average
- Data Projects: at least 80% average

For "C-/C/C+" you must do all of the following:

- Participate in class with at least 70% of in-class work completed satisfactorily*
- Homework: at least 70% of Practice Problems; 70% of "Basic" problems in a legible, satisfactory way**
- Reference Book: Create your own basic Statistics Reference Book.
- Exams/Quizzes: at least 65% average
- Data Projects: at least 70% average

For "D" you must do all of the following:

- Participate in class with at least 60% of in-class work completed satisfactorily*
- Homework: complete a majority of Practice Problems and "Basic" problems in a legible, satisfactory way**
- Reference Book: Create your own Statistics Reference Book.
- Exams/Quizzes: at least 50% average
- Data Projects: at least 60% average

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

*regarding in-class work, exceptions are allowed if make-up arrangements are made in advance and missed work is made up

** Homework includes problems from the textbook, along with other handouts and assignments.

Due Dates: Each assignment will have a "due date" associated with it. Homework assignments will generally have a "due date" of the next class; you should try to finish the assignment before the next class, but, if you have questions, you can get help and then finish up the assignment and turn it in at the following class (without being considered late). December 20 is the last day to submit any late work. Work that is returned for revision will have revised "due dates" (and will not be considered "late").

Homework:

General Guidelines:

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.
6. **With textbook homework, check all your answers in the back of the book or in the Solutions Manual before** turning it in. It is your responsibility to check your work and get help if and when you have questions.

There will be three categories of assignments: : "Practice Problems" and "Basic" and "Advanced." Everyone is expected to do "Practice Problems" and "Basic" problems to turn in. You only need to do "Advanced" problems if you want a grade higher than C.

- Label "Practice Problems" clearly and do them all together on the same page(s). These are for practice so it's ok if they look like "scratch" work; number each problem clearly. For "Practice Problems," it's ok to just turn in the answers, if no written work is needed. (Keep the "Basic" and "Advanced" separate from "Practice Problems").
- "Basic" and "Advanced" should be labeled clearly and 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***.

Other than problems in the book, some assignments will be on handouts, and some 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.

Reference Book: — You will be constructing your own personal "Statistics Reference Book" throughout the course (see "Bound Notebook with Grid Paper" under "Other Required Materials"). 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 your future You!***

Exams and Quizzes:

- **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** — Each Unit has a Unit Exam of approximately 45 minutes, focusing on material from that Unit.
- **Final Exam** — Comprehensive Final Exam during Finals Week: Thursday December 19.

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.

Prerequisites/co-requisites/ recommended preparation

For Math 15: Completion of Intermediate Algebra or appropriate placement based on AB 705 mandates.
Math 15s has no prerequisite, but is linked to Math 15.

Institutional Policies

Special accommodations statement (**required for online classes*)

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 accommodations, please see me or contact Disability Services and Programs for Students. Students may make requests for alternative media by contacting DSPS based on their campus location:

- Eureka: 707-476-4280, student services building, 1st floor
- Del Norte: 707-465-2324, main building near library
- Klamath-Trinity: 530-625-4821 Ext 103

Student Access (**required for online classes*)

These standards are required by federal regulation. Students will have access to this course that complies with the Americans with Disabilities Act of 1990 (ADA), Section 508 of the Rehabilitation Act of 1973, and College of the Redwoods policies. Course materials will include a text equivalent for all non-text elements; videos will include closed captioning, images will include alt-tags, hyperlinks will use descriptive/meaningful phrases instead of URLs and audio files will include transcripts. All text will be formatted for use with screen readers and all course materials will be understandable without the use of color.
Students who discover access issues with this class should contact the instructor.

Academic dishonesty

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. 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 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, the student 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. 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.

Policies for this Class

In-Class Participation — For both classes – Math 15 and Math 15s – It is extremely important that you attend each and every class session and participate and keep up. We cover 15 chapters in about 40 classes and it's nearly 1000 pages! That's about 25 pages per day class session, on average. And Math 15 and Math 15s go hand-in-hand. ***If you miss more than four class sessions of either class, you may be dropped from both courses – Math 15 and Math 15s***.

During class we will have "Let's Do It!" activities. Sometimes collaboration via small-group work is allowed (even encouraged and expected), but you are still responsible for completing your own work. We will also often have group discussions, and you are expected to participate both as an active listener and as a contributor. Participation in this fast-

moving class is essential for your success! I plan to record attendance each day and note students who are tardy, or who leave early, or who are not participating. If you have an issue that prevents you from attending (and paying attention) for an entire class period, I would appreciate it if you would advise me of that (I do not need details), and work out a "recovery plan" so that you don't lose out on too much information.

Communication Guidelines

To communicate with me outside of class, email or messaging via Canvas is generally fine. Please know, though, that these methods are not completely reliable; if you have not gotten a response the same day (or within 24 hours), please re-send your message using the other method (so if you emailed, try Canvas next). Phoning is also fine, but if you left a voicemail and have not gotten a timely response, please try another method (such as Canvas messaging) because often voicemail messages are difficult to hear clearly (sometimes due to your cell phone and your location when you call).

For me to communicate with you during this quick-moving course, I expect you all to have online access for email and Canvas, as well as for other online resources. To communicate with the entire class at once, I will generally post an Announcement in Canvas; with more pressing information, I might also send a Canvas "message" to the entire class.

I expect you to have access to email 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. Note that you can set it up to autoforward to another email address if you prefer. Instructions for autoforwarding are available online. Similarly, Canvas messages can be set to autoforward to your personal email, if you prefer.
Regarding student privacy rights: legal rights of students prevent information from being disclosed to anyone (including parents/guardians) without the student's prior written consent.

Time. Plan on devoting Lots!! In your own weekly schedule it is strongly recommended that you have blocked out 12 to 15 hours *per week* to devote to this class. The book is 15 chapters in about 1000 pages!

Information for this Class

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 statistical results. It isn't enough to know how to do algebraic manipulations, or how to find things on your calculator. You will need to learn which are correct formulas (or statistical tests), that are appropriate for 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 assumptions behind different answers and how to assess which answer you feel is best.
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
- Comprehension

    - How related things compare (similarities, differences)
    - How to interpret summary information
    - How to make inferences/predictions based on limited information
- Application
    - How to apply what you know to new situations
    - How to make use of 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
    - Look back and assess what was done (by you or others) to compare and evaluate results

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

The course material is organized into five Learning Units, with three chapters in each
At the end of each Unit, there will be a Unit Exam and a grade update.

Unit	Chapter Titles, pages	*tentative* exam dates
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)	Unit 1 Exam: Tue Sept 17 (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)	Unit 2 Exam: Thu Oct 3 (45 minutes)
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)	Unit 3 Exam: Tue Oct 22 (45 minutes)
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)	Unit 4 Exam: Thu Nov 7 (45 minutes)
5	Chapter 13: Regression Analysis (pp 807-901) Chapter 14: Analysis of Count Data (pp 921-966) Chapter 15: Nonparametric Statistics (pp 977-1002)	Unit 5 Exam: Thu Nov 21 (45 minutes)

Note: **Comprehensive Final Exam** on Units 1-5 on Thurs., December 19, 1:00-3:00pm (2 hours)