Syllabus for: Math 15 Elementary Statistics

Semester & Year:	Fall 2016
Course ID and Section Number:	Math 15 – K0318
Instructor's Name:	Danny Ammon
Day/Time:	Tuesdays Thursdays 7:40-9:45 pm
Location:	HTEC Rm 3
Number of Credits/Units:	4
Contact Information:	*Office location*: HTEC Rm 3 *Office hours*: Tue 6:30-7:30 pm *Email address*: danny-ammon@redwoods.edu
Textbook Information:	*Title & Edition*: *Interactive Statistics*, 3rd Edition *Author*: Aliaga & Gunderson *ISBN*: 0131497561

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 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.

Prerequisite: MATH-120 or Math 194 Intermediate Algebra

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.

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.

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: www.redwoods.edu/district/board/new/chapter5/documents/AP5500StudentConductCodeandDisciplinaryProceduresrev1.pdf 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: www.redwoods.edu/district/board/new/chapter5/documents/AP5500StudentConductCodeandDisciplinaryProceduresrev1.pdf

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:

Please review the campus evacuation sites, including the closest site to this classroom (posted by the exit of each room). For more information on Public Safety, go to http://redwoods.edu/safety/ 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 campus authorities.

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, 707-476-4112, security@redwoods.edu, if you have any questions.

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:

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. Either the standard wire-bound version or the custom-published paperback version is fine.

- **Graphing Calculator**: A Graphing Calculator, such as a TI-83 Plus, TI-84.

- **Bound Notebook**: Just check to make sure it is **bound**. You will use this throughout the course to build yourself a reference book

- **Time. Lots!!** In your own weekly schedule please make sure that you have blocked out at least 15 hours *(possibly as much as 20 hours)*, per week, to devote to this class.

- **Paper**: Homework Paper and scratch paper, lots of it!

- **A ruler**: Important for drawing tables and graphs carefully and correctly.

- **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.
    - CANVAS: We will have some course materials available using the CANVAS course system. (This is a separate thing from your email but you need access to a computer for this also.) Grades will also be available on CANVAS, as well as assignments.

Course Requirements (subject to change with fair notice):

Participation in Class Activities: Attendance and participation are essential to the learning process. In addition, everyone benefits from your input and participation, and some work we do will be in groups! One important aspect of this course is the incorporation of active learning in class; this requires everyone's participation, particularly during in-class activities. Also, the best way to insure having a successful experience in any course is to come to every class meeting and keep up with the assignments. There will often be handouts during class to be turned in at the end of class

I realize that sometimes things come up and getting to class is impossible. In those cases, just communicate (email) with me as soon as you possibly can.

Note that ALL students remain responsible for ALL assignments given and that those assignments are expected to be turned in ON TIME. If you miss a class, the assumption is that you will get the necessary information to complete the assignment by the due date and be prepared to continue in the normal flow of the course.

> **CAUTION: the material builds from one week to the next and so IT IS STRONGLY URGED THAT ALL STUDENTS ATTEND ALL CLASSES.**

Problem Sets, assigned from the textbook: Problems will be assigned every class. There will be "Basic" problems and "Advanced" problems (see grading information). Show your work, and work neatly and legibly.

Reference Book: Each student is required to 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.

Exams: There is a Final Exam during Finals Week. The Final Exam will be comprehensive and you will be able to refer to your own Reference Book which you will be making throughout the semester.
Final exam date and time: Tuesday December 13, 7:40 – 9:45 PM.

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. Homework assignments are worth 5 points each. They may be turned in up to one week late with no penalty. They may be turned in up to two weeks late with a 1-point deduction. They may be turned in up to three weeks late with a 2-point deduction. They may not be turned in after 3 weeks late for any credit. Partially completed homeworks will have point(s) deducted.

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

The course material is organized into six Learning Units. Approximate dates are listed.

Unit 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

Unit 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

Unit 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

Unit 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

Unit 5

Chapter 13: Regression Analysis (pp 807-901)
Data Assignment #5

Math 15 ASSIGNMENTS — *What exactly do you have to do?*

1. **In-class work** — The entire semester course is jammed into ***15*** weeks. It is extremely important that you attend each and every class session and participate and keep up. We cover 13 chapters in 29 days and it's about 700 pages! Do the math!

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 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 50 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. Each class you will get a homework assignment and it is due the following class. You may turn in homework late, but the grade may be reduced for being late. Homework exercises will be designated as "Basic" or "Advanced." In order to pass the class, you must do the "Basic" problems but you only need to do "Advanced" problems if you want a grade of "A" 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"). You will have freedom to include pertinent information, definitions, examples, notes, that you think will be helpful for you as reference material. ***Create a Reference Book that helps You!*** You will be allowed to use the your Reference Book on the Final Exam and it is due the day of the Final Exam December 13th.

4. **Final Exam** — There will be a comprehensive Final Exam on the last class December 13th.

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.

Math 15 GRADING CRITERIA —

Homework Exercises from book	45%
Participation	15%
Your own Statistics Reference Book	10%
Data projects	15%
Final Exam	15%

90 - 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
Below 60%	F