Syllabus for: **Math 15 Elementary Statistics**	
Semester & Year:	Fall 2015
Course ID and Section Number:	Math 15 – K8878
Number of Credits/Units:	4
Day/Time: **Location:**	Tuesdays Thursdays 6:40-8:45 pm KTIS Room 3
Instructor's Name:	Danny Ammon
Contact Information:	Office location and hours: KTIS Room 3 TueThur 5:35-6:35 pm Email: danny-ammon@redwoods.edu

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

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 accommodations document to me as promptly as possible so that necessary arrangements can 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.

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" on the assignment/test/project the first time, and will receive an "F" in the course the second time.

The student code of conduct is available on the College of the Redwoods website at: http://redwoods.edu/District/Board/New/Chapter5/AP%205500%20Conduct%20Code%20final%2002-07-2012.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 homepage.

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:

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 with Grid Paper**: Just check to make sure it is **bound** and has **graph paper** in it. 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; you can set it up to auto-forward those emails to another email address if you prefer.
    - **"Canvas" course materials**. 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.)

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. If you miss more than four class sessions, you may be dropped from the course.

I realize that sometimes things come up and getting to class is 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 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. There will not be time for every problem to be graded carefully, so it is even more 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.

Projects: Projects will be explained on handouts. Projects are larger assignments done outside of the classroom.

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. It is up to you to decide exactly what to include. Each page should be its own separate topic. The Reference Book is due the day of the Final Exam and you will be allowed to use it on the Final Exam.

Exams: There will be 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. We will also do a Practice Final Exam the class before the Final. **Final exam date and time:** Tuesday December 8th, 6:40 – 8:45 PM.

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.

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

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

Unit 1 (8/25-9/10)

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 2 (9/15-9/24)

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: *Proportion*: Binomial data, 1 categorical variable from 1 population

Unit 3 (9/29-10/15)

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: Bivariate Quantitative Data, 2 variables from 1 Population

Unit 4 (10/20-10/29)

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 5 (11/3-11/19)

Chapter 13: Regression Analysis (pp 807-901)

Data Assignment #5: Use bivariate data set from previous data collection

Unit 6 (11/24-12/3)

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

Note: Comprehensive Final Exam on Units 1-6 on Tuesday December 8

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 15 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 8th.

4. **Final Exam** — There will be a comprehensive Final Exam on the last class December 8th.

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	35%
Participation	15%
Your own Statistics Reference Book	10%
Data projects	25%
Final Exam	15%

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