"Facts are stubborn, but statistics are more pliable." Mark Twain

Syllabus for Mathematics 15, Elementary Statistics

Semester & Year	Spring Semester 2017, January 14 - May 14	
Course ID and Section #	Math 15 V1088	
Instructor's Name	Michael Butler	
Day/Time	Online	
Location	Online	
Number of Credits/Units	4	
Contact Information	*Office location*	Canvas
	Office hours	TBA
	Phone number	707-476-4234 (message only)
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Textbook Information	*Title & Edition*	Open intro Statistics 3ed, https://www.openintro.org/stat/textbook.p h
	Author	Diez/ Barr/C etinkaya-Rundel
	ISBN	978-1943450039

Course Description

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.

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 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: 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.

Computer Skills:

Online courses require adequate computer skills. You should be able to navigate the course websites, open and download files, use a word processor and submit files to the class website. We will be using the software package R and the interface RStudio in our investigation of statistics and as our primary tool for writing up homework assignments. It is your responsibility to meet the technological demands of the course but there will be lots of support to help you meet those requirements.

Computer Requirements:

A Mac, Windows, or Linux computer and internet providers are needed. You should have high-speed internet (such as broadband) service from cable, DSL, or satellite providers as there are required multimedia assignments. You need to have reliable access to the internet at least four days a week for 16 weeks. Anticipate problems with your computer and internet

access (including power outages) by not waiting until the last minute to submit assignments. ***Portable Devices vs. Computers:*** *You will not be able to participate in this class solely from a portable device.* The software we will be using to do our work requires a Mac or a PC)or Linux). If you do decide to use your portable device for some of your class work, use the free Canvas app (called "Canvas by Instructure") available in iTunes (for iOS) and the Google Play Store (for Android) instead of trying to connect to Canvas using a web browser on your portable device. Your experience will be a lot better using the app, but will still not substitute for having regular access to a computer to complete work in this course.

Required Resources:

(1) Text: OpenIntro Statistics 3ed. You can get the text for free as a pdf from https://www.openintro.org/stat/textbook.php or a printed copy from Amazon (link on OpenIntro site).

(2) The software packages R (https://cran.rstudio.com) and RStudio (https://www.rstudio.com) installed on your computer. There is a video in the Course Introduction Module showing how to install these software packages on our Canvas site.

(3) A Composition Book to create a "Statistics Quick Reference" book in. Details on this book are provided in the Course Introduction Module.

Student Commitment:

This course requires at least 10+ hours per week for sixteen weeks of your time. You will need to carefully read assigned reading from the text, watch videos, participate in online discussions, complete weekly quizzes, and complete exercises and labs from the text. Conscientiousness, attention to details, and skills in reading and writing are critical for success. It is **not** expected that you have any previous experience in the use of the R software package.

Instructor Commitment:

I access the class website regularly and respond to posted questions and messages usually within 24 hours and no later than 48 hours. Additionally, I participate in the discussions. There is also regular instructor-based communication with weekly announcements, lectures, and evaluative feedback to your discussion posts.

Class Environment:

It is expected that everyone involved in this class, teachers and students alike, will act in a manner conducive to providing a comfortable environment for learning, a place where students feel free to ask and answer questions without fear of embarrassment or ridicule. It is important to stay on task. Hence, posts to Canvas that do not pertain to the subject at hand will be removed. If you have an issue with another student's posts, please direct those concerns to me. It is essential for student success to maintain a good environment in our virtual classroom. If you have any difficulties with the learning environment, please send me an email with your phone number with a time to contact you. (The official Student Code of Conduct (AP5500)

Please review the Principles of Netiquette (Links to an external site.)for how to get the most out of an online course.

Homework:

The Modules link in Canvas are where you will find the homework assignments. All homework assignments will be typed up in RStudio and submitted to Canvas as an .html file. Homework is an essential part of this course and if you want to succeed, you need to make a commitment now to staying up with the homework. There is a course video in the introductory module showing how to submit homework.

Writing Assignments:

There will be writing assignments posted to the Discussion area in Canvas for each module. Most of these writing assignments are based on the current material being covered. There purpose is to help you find clarity in the concepts presented and to give you an idea of what content should be entered into you Reference Book.

Reference Book:

You will be building a "Statistics Quick Reference Book" during the course that you will find invaluable during the quizzes and exams. If you are planning on taking a second course in statistics, this reference book will also be of use there. Please buy a composition book to build this reference book in. You are allowed to use the book on all quizzes and the two exams (midterm and final). Full details on how build this valuable resource can be found in Course Introduction Module.

Quizzes:

There will be two short quiz in each module taken via Canvas. The quizzes will generally be between 5 and 10 questions and come from the current weeks reading, homework, and videos. The first quiz is assigned right after you finish the reading, the second is after you finish the assignment. Again, your Reference Book will be of great assistance in completing the quizzes as you're allowed to use it during quizzes. No makeup quizzes are allowed without prior arrangements. The quizzes are timed at between 20 to 40 minutes. If you try to use the text or other resources for help, you will run out of time prior to completing the quiz. Keep in mind it is your education we are working on here and that you are expected to adhere to the Student Code of Conduct when taking quizzes and exams.

Exams:

There will be two exams in this course given using the testing system in Canvas. Again, you are expected to adhere to the student code of conduct when taking these exams. You will be allowed to use your Reference Book with the cumulative notes that you have been keeping there. You are not allowed to use your text or other websites during these exams. Since the exams are timed (2 hours), you will not be able to complete them if you are using your text and other resources. The exams will **not** be proctored.

Attendance:

There is a Discussion in Module 1 where you will find an introduction from your faculty member and where you are expected to post an introduction of yourself to the class. IF YOU DO NOT POST AN INTRODUCTION BY FRIDAY OF THE FIRST WEEK IT WILL BE ASSUMED THAT YOU HAVE CHANGED YOUR MIND ABOUT TAKING THIS COURSE AND YOU WILL BE WITHDRAWN. For the duration of the class you must be showing progress by completing assignments on time and by participating in writing assignments posted in Canvas.

Technical Support:

Before contacting Technical Support please visit the CR-Onlinepage and see if your issue can be resolved using the resources there.

For access issues with Canvas, Web Advisor or your mycr.redwoods.edu Email, contact Technical Support at its@redwoods.edu or call 707-476-4160 or 800-641-0400 ext. 4160 between 8:00 A.M. and 4:00 P.M., Monday through Friday.

Tutoring and Additional Help:

There is a Discussion area for asking questions about assigned problems from the text. Please make this your first stop for asking questions. If you email me a question, I will reply to you in Discussions so others can also benefit from your query. Please help each other! Sometimes a peers explanation will make more sense to you then the one I post.There will be several optional assignments during the course that can help you regain points if you fall behind. More information about that can be found in the Course Introduction Module.

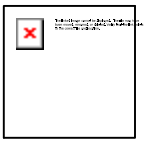
I do requests! If you are finding the explanations in the videos are not enough, you can request additional problems to be worked on video. It usually takes about 48 hours to turn it around, so ask early if possible.

There is free tutoring in the Math Lab on the CR Eureka campus. If you live in the Eureka area, then you should consider signing up for the non-credit Math 252. It is a free course that allows you access to the tutors in Math Lab.

Any questions of concerns, please email me at michael-butler@redwoods.edu

Disclaimer:

I make every attempt to provide accurate information in this syllabus. If there are errors or the need for a change in policy, I will inform you of the changes prior to implementation.

Be sure and view all of the tabs above before moving on 

Course Schedule (note that this is subject to modification)

Dates	Topics	Assignments
Week 0ne **J**	**Module 1** **Introduction to Course** **Introduction to Data:** Designing Studies, Exploratory Data Analysis	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **Quiz**
Week Two	**Module 2** **Introduction to Data:** Designing Studies, Exploratory Data Analysis	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **Quiz**
Week Three	**Module 3** **More on Data :** Proper summary of data, plots of numeric and categorical data. Beginnings of inference	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **Quiz**
Week Four	**Module 4**	**Read Text**

	Probability: Conditional probability, Normal distribution, Binomial Distribution	**Watch Videos** **Work Exercise** **Discussions** **Quiz**
Week Five	**Module 5** **More on Probability:** Normal distribution, Binomial Distribution	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **Quiz**
Week Six	**Module 6** **Foundations for Inference:** Normal approximation to the Binomial, Variability in estimates and the Central Limit Theorem, Confidence intervals	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **MIDTERM**
Week Seven	**Module 7** **More on Foundations for Inference:** Hypothesis tests, Inference for other estimators, Decision errors, significance, and confidence	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **Quiz**
Week Eight **MIDTERM THIS WEEK**	**Module 8** **More on Foundations for Inference:** Hypothesis tests, Inference for other estimators, Decision errors, significance, and confidence	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **Quiz**
Note: Spring Break is from **Mar 13 - Mar 18** **Week Nine**	**Module 9** **Inference for numerical variables:** Comparing two means, Inference with the t-distribution, Comparing three or more means	**Read Text** **Watch Videos** **Work Exercise**

		Discussions **Quiz**
Week Ten	**Module 10** **More on Inference for numerical variables:** Comparing two means, Bootstrapping, Inference with the t-distribution, Comparing three or more means	**Read Text** **Watch Videos** **Work Exercise** **Discussions** **Quiz**
Week Eleven	**Module 11** **Inference for categorical variables:** Single proportion, Comparing two proportions, Inference for proportions via simulation	**Read Text** **Watch Videos** **Work Exercise** **Discussions**
Week Twelve	**Module 12** **More on Inference for categorical variables** Comparing three or more proportions (Chi-square), Relationship between two numerical variables	**Read Text** **Watch Videos** **Work Exercise** **Discussions**
Week Thirteen	**Module 13** **Introduction to Regression:** Linear regression with a single predictor, scatterplots, residual plots, correlation	**Read Text** **Watch Videos** **Work Exercise** **Discussions**
Week Fourteen	**Module 14** **More on Regression:** Inference in regression	**Read Text** **Watch Videos** **Work Exercise** **Discussions**
Week Fifteen	**Module 15** **Inference in Regression and Course Summary:** Mixed review of problems and techniques from the course	**Read Text** **Watch Videos** **Work Exercise** **Discussions**

Week Sixteen **Final Exam Week**	**Module 16** **Final Exam:** Written and Canvas Quiz.	**Read Text** **Watch Videos** **Work Exercise** **Discussions**

Click NEXT to move on in the module