

Syllabus for STAT 2480: Statistics for the Life Sciences (Spring 2016)

Instructor: Sean O'Neill

Office: 229 Cockins Hall

Office hours: W F 2 pm – 2:50 pm (Starting Week 2) or by appointment

Email: oneill.90@osu.edu

Lecture Location: 131 Hitchcock Hall

Lecture Time: W F 12:40 pm – 1:30 pm

Required Text: The Analysis of Biological Data, 2nd Ed by M.C. Whitlock and D. Schluter, Roberts & Co., 2014.

College of Arts and Sciences GE Requirements: Stat 2480 is a Data Analysis course in the Quantitative and Logical Skills category of the GE Requirements.

Expected Learning Outcomes: Students understand basic concepts of statistics and probability, comprehend models needed to analyze and critically evaluate statistical arguments, and recognize the importance of statistical ideas.

Course Description: Statistical methods play an important role in the analysis of data collected in the biological sciences. This course will provide an introduction to the analysis of biological data in a statistical framework. The topics covered include the definition of probability and manipulation of probabilistic quantities; the common discrete and continuous distributions used in modeling biological phenomena; experimental design; statistical methods for testing hypotheses.

Website: Please visit <http://carmen.osu.edu> . Check Carmen periodically for announcements about the class and other class material.

Homework: Homework problems will be assigned and graded for each topic covered in the course. Homework must be turned in during recitation on the date it is due. **NO LATE HOMEWORK WILL BE ACCEPTED.** Please write your name on the top of each page of your assignment and staple the pages together.

Recommended Homework Exercises: Each homework assignment will include exercises that are “recommended,” but not turned in. These are fair game in terms of concepts for exams.

Exams: There will be three in-class exams. The exam dates are provided on the schedule attached to this syllabus. Statistical tables will be provided as needed. Calculators may be used on exams, however **NO** cell phones, PDAs , or other communication devices are allowed.

Notes for use on exams: You may use one 8.5” x 11” sheet of paper (both sides), with whatever facts, formulas or explanations you find helpful.

Makeup Exams: If you absolutely need a makeup exam and have a valid excuse, please see me (not your recitation instructor) for the necessary arrangements. However, you must notify at least **ONE WEEK** in advance. A makeup may be a bit harder than the regularly scheduled exam and must be taken within one week of the missed exam. Exceptions to this policy will be permitted only in extreme situations.

Full credit on homework and exam problems: You need to show your justification or work on each homework and exam problem. Answers without work will not receive full credit.

Final Grade: Your final course grade will be based on the following weighting of class components: Homework=30%, exams=20% each, lab participation=10%. The grade scale will be as follows: $\geq 93 = A$, $93 >$ and $\geq 90 = A-$, $90 >$ and $\geq 87 = B+$, $87 >$ and $83 \geq = B$, $83 >$ and $\geq 80 = B-$, $80 >$ and $\geq 77 = C+$, $77 >$ and $73 \geq = C$, $73 >$ and $\geq 70 = C-$, $70 >$ and $\geq 67 = D+$, $67 >$ and $\geq 60 = D$, $60 > = E$.

R Software: The R software will be used for the lab portion of the course. This software is installed in the recitation classrooms, as well as in most computer labs on campus. It is free software that you can download and install on your personal computer. Your TAs will help you learn to use R for statistical analysis during recitation, but you should also expect to put in time outside of recitation doing data analysis with R for homework.

Course Teaching Assistants: The course teaching assistants will assist you in working through suggested problems, and they will work with you to perform some activities using the R software. You are also encouraged to visit office hours if you have further questions.

Academic Misconduct: It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with exams. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>

Email Correspondence: In order to protect your privacy, all course email correspondence must be done through a valid OSU name.nn account.

Special Accommodations: “Students with disabilities that have been certified by ODS will be appropriately accommodated and should inform the instructor as soon as possible of their needs.” The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Ave; Tele 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

Note: Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change.

LECTURE SCHEDULE

	TENTATIVE LECTURE TOPIC	Reading
1/13	Intro/Displaying Data	Ch 1&2
1/15	Descriptive Statistics	Ch 3
1/20	Probability	5.1-5.7
1/22	Probability	5.1-5.7
1/27	Bayes Theorem	5.7-5.9
1/29	Probability Distributions	5.4
2/3	Binomial Distribution	7.1-7.4
2/5	Testing a Proportion	7.1-7.4
2/10	Discrete Data, Chi-squared test	8.1-8.5
2/12	Poisson Distribution	8.6
2/17	Review for Exam 1	
2/19	EXAM 1	Ch 1-8
2/24	Odds Ratios	9.1-9.2
2/26	Contingency Tables	9.3-9.4
3/2	Normal Distribution	10.1-10.5
3/4	Sampling Distributions	10.6
3/9	Estimating Means, Confidence Intervals	11.1-11.2
3/11	Hypothesis Test for Single Mean	11.3-11.4
3/16	NO CLASS	
3/18	NO CLASS	
3/23	Hypothesis Test for Single Variance	11.5
3/25	Comparing Two Means (Not on Exam 2)	12.1-12.3
3/30	Review for Exam 2	Ch 9-11
4/1	EXAM 2	
4/6	Hypothesis Testing/Comparing Two Variances	12.4-12.7
4/8	Correlation and Regression	Ch 16
4/13	Linear Regression	17.1-17.3
4/15	Linear Regression	Ch 17
4/20	Course Summary/Review for Exam 3	
4/22	Course Summary/Review for Exam 3	
TBA	Final Exam: EXAM 3	Ch 12-17

RECITATION SCHEDULE

	RECITATION TOPIC
1/14	LAB: Intro to R
1/21	LAB: Intro to R (cont)/ HW 1 Due
1/28	LAB: Random Sampling
2/4	LAB: Displaying Data with R/HW 2 Due
2/11	LAB: Binomial Distribution
2/18	PROBLEM SOLVING/ HW 3 Due
2/25	LAB: Normal Distribution Plots
3/3	LAB: Central Limit Theorem
3/10	PROBLEM SOLVING/ HW 4 Due
3/17	NO LAB
3/24	LAB: Confidence Intervals
3/31	PROBLEM SOLVING/ HW 5 Due
4/7	LAB Hypothesis Testing
4/14	LAB: Regression/HW 6 Due
4/21	PROBLEM SOLVING