

Instructor	Cecile Ane
Office	1208 Medical Science Center (MSC)
Phone	262-3901 (MSC), 262-6820 (Birge)
email	ane@stat.wisc.edu
Office Hours	T 1-2pm in 1208 MSC and F 9-10am in 341 Birge, and by appointment.

TAs	Donggyu Kim (331, 332, 333)	Yi Liu (334)
Office	1245D MSC	1214 MSC
Phone	262-5767	262-3615
email	kimd@stat.wisc.edu	liuyi@stat.wisc.edu
Office Hours	TBD	TBD

Class Hours	TR 2:30-3:45 in 331 SMI
Textbook	<i>The Analysis of Biological Data</i> , by Michael Whitlock & Dolph Schluter
Web	<a href="http://www.stat.wisc.edu/courses/st371-ane">http://www.stat.wisc.edu/courses/st371-ane</a>

**Course Objective.** The goal is to provide undergraduate students in the Life Sciences with an introduction to modern statistical practice. An understanding of the concepts will be stressed along with applications. Mathematical complexity will be kept to a minimum and analysis of data will receive substantial attention. The development of the ability to interpret results and to evaluate critically the design and methods used will be of most importance.

**Computing.** Authentic experience with modern statistical practice cannot bypass the use of a computing tool. We will make use of the software R, which is free and has excellent graphics. It is available on all platforms (Windows, Mac and linux). This tool is widely used for research in biology. There is no assumption in this course of prior experience with R or with any other particular software. All information you need to use R will be provided to you. Most homework assignments will require the use of R. An introductory level of R will be expected in exams, and will also be useful to successfully complete the group project.

**Discussion Sections.** Attendance in discussion sections is strongly advised. If you own a laptop, you are encouraged to bring it to discussion. Definitely bring it to the first discussion, which will have a strong focus on getting started with R.

**Homework.** There will be weekly homework assignments. Doing homework on a regular basis is the best way to learn. Much of your learning will take place while working the problems. Homework has 2 aspects: It is *The* way to make yours all what you read and listen to, and it will provide you with feedback on your work. Homework will be posted on the course's web page on Thursdays and returned in lecture the following Thursday. Late homework will be penalized except under extenuating circumstances and if prior arrangements have been made with me. Late homework handed in after the solution is posted on the website will receive no credit. For the interest of all, I will not (or rarely) delay the posting of homework solutions. Your homework solutions should be well organized and neat. This way, you will demonstrate your ability to communicate your results. If homework assignment is hard to get through because of organization or hand-writing, there will be a penalty.

**Group project.** Students will form groups of 3 (occasionally 2) to work on a project. The goal is to provide an authentic experience doing statistics. The authenticity comes from working with real data, with a statistical computing software, not being limited to 2 hours, and being

able to talk through issues and make decisions with peers. I believe that many students can better show their statistical skills through this type of project than in time-limited quizzes. You will all be on your honor system. I may remove this group project opportunity if I find issues about academic honesty. Groups will be formed using a randomization procedure. Grading and writing a constructive critique of final reports from 2 other groups will be part of the learning experience. Final reports are due in class Tuesday **May 1st**. Detailed information is provided in a separate handout.

**Exams.** There will be two midterm exams and a final exam. Exams will cover lecture materials, handouts, homework and readings. One sheet of notes will be allowed for the first midterm, while two sheets of notes will be allowed for the second midterm and the final exam. The second midterm and the final exam will also be open book. Notice of any conflict (religious or other) with these dates must be given to me within the first week.

Midterm 1	Midterm 2	Final exam
Tuesday <b>Feb. 28</b>	Tuesday <b>April 10</b>	Friday <b>May 18</b>
regular class time	class time	5:05 - 7:05 pm

**Grading.** Final letter grades will depend on final scores based on a curve. I will not give letter grades for midterm exams. Scores will be averaged with these weights:

homework	midterm 1	midterm 2	group project	final exam
15%	15%	15%	15%	40%

**Honors.** Students enrolling for the honors component will do an oral presentation of their group project during the final week. Come see me to make an appointment.

**Academic honesty.** You are encouraged to talk to other students, your teaching assistant or me about your homework or your group project. The TAs or I will provide guidance and hints, but will not solve the problems for you. I am convinced it is very beneficial to solve problems with other students, share and discuss ideas. However, you may not present other people's work as your own. If you work with other students to solve homework problems, you still have to write up your own solution independently. Each group should work independently of other groups. Written reports may not be shared between groups until they are due for grading. The opportunity to participate in a group project experience depends on your academic honesty. I may remove this opportunity if I find evidence of academic dishonesty from one of more students. You must work independently during exams. You may *not* share calculators or pass notes during exams.

**Laptop policy.** You may enjoy the wireless capability of the classroom so long as you stay on task. Advantages to using a laptop include: taking notes, viewing lecture notes rather than printing them, experimenting with R or other computing software, etc. There are also limitations; figures and sketches cannot be created on a notebook in the classroom for instance. Activities such as emailing, web surfing and gaming are not allowed in class. They are a distraction to classmates: be respectful of others. Be sure the sound is off at the beginning of the class. In "no laptop times" laptop users will be asked to close their lids.

**Tentative Schedule.**

TR 1/24-1/26	Graphics & Descriptive Statistics	Chapters 1, 2 & 3
TR 1/31-2/2	Probability and Random Variables	Chapter 5
TR 2/7-2/9	Binomial & Normal distributions	Chapters 7 & 10
TR 2/14-2/16	Sampling Distributions	Chapters 4 & 10
TR 2/21-23	Hypothesis testing with proportions	Chapter 6 & 7
T 2/28	Midterm (50 min) & group project time (25min)	cumulative
RTR 3/1-3/8	One-sample estimation	Chapter 11
TR 3/13-3/15	Two-sample comparison	Chapter 12
T 3/20	Checking assumptions	Chapter 13
R 3/22	Basic ideas of experimental design	Chapter 14
TR 3/27-3/29	Comparing proportions	Chapter 9
TR 4/3-4/5	Spring break	
T 4/10	Midterm (50 min) & group project time (25min)	cumulative
RTRT 4/12-4/24	Analysis of variance	Chapter 15
RT 4/24-5/1	Regression and correlation	Chapters 16 & 17
T 5/1	Group project reports due	
RT 5/3-5/8	Regression and correlation (con't)	Chapters 16 & 17
T 5/8	Report evaluations due	
R 5/10	Review	
Sun. 5/10	Final exam	cumulative