WELCOME TO PSTAT 5LS!

Statistics for the Life Sciences

CLASS INFORMATION

INSTRUCTOR
Dr. D. E. Holmes
South Hall 5506
Phone: (805)-893-8887
Email: holmes@pstat.ucsb.edu

TEACHING FORMAT
Lectures:
M W F 2:00-2:50
NH 1006

Mandatory Sections:
One discussion section each week will be in the computer lab.
One discussion section each week will be in the classroom

INSTRUCTORS OFFICE HOURS
Monday and Friday 10.00 - 11.00. Also email. Other times by appointment.

HEAD TA
Nicole Ifill
Email: ifill@pstat.ucsb.edu

TEXTBOOK
The Practice of Statistics in the Life Sciences
Brigitte Baldi and David S. Moore (1st Edition March 2008)

TECHNOLOGY
Excel. The text itself has a "Using Technology" section in almost every chapter. The sections display and explain output from the TI-83/84, Minitab, SPSS, CrunchIt!, and Excel. We will use Excel. All data sets can be downloaded in various formats online (and from the book CD).

COURSE DESCRIPTION
An accessible introduction to the uses and applications of statistics in the life sciences, including information on: variables; data distribution; correlation and regression; research design; probability and statistical inference.

THE COURSE WEBSITE
Homework will be posted each week on the course website. All homework will be set with a view to providing you with the skills required for the assessments. If you cannot do the homework, please seek help, otherwise you will not understand subsequent lectures. Homework is not graded.

Prior to the midterm and the final, practice exam papers with solutions will be available on the website. It is important that you familiarize yourself with the style and content of these exam papers. Your TA will help.
ASSESSMENT
During tests, you will NOT be allowed to consult your textbook or any notes. All relevant formulas will be provided. Please bring your calculator (make sure that you know how to use it and that it is in full working order). Leave phones at home. No IPODS or other electronic gadgets will be tolerated.

- Midterm 1 (Friday Week 4) 20
- Midterm 2 (Monday Week 9) 20
- Classroom Section Exercises 10
- Computing exercises (10) and Report Writing (5) 10+5
- Final Exam 35

a) Classroom Section Exercises.
These are usually taken from the textbook.

b) Exam Questions.
Both the midterm and the final should require the student to do more than calculate. Questions requiring interpretation will also be set.

c) Lab Section Exercises and report writing:
Students learn to produce, read and use output. Students write reports based on their analysis of given data.

There will be no make-up tests. No exceptions!
It is your responsibility to ensure that you are available at the designated assessment times.

SUGGESTIONS ON HOW TO GET THE GRADE YOU WANT

✓ Attend all the lectures. Lectures will contain material and examples that are not available elsewhere.

✓ Do all the recommended exercises.

✓ Encourage other members of your discussion section to do well. Grades are not given on a competitive basis.

✓ Bring problems to the attention of your teaching assistant and/or the instructor. We are all there to help you in this course.

✓ Don't miss section or tests - no make-ups will be given.

✓ Budget your time to ensure you can spend 10 hours a week in addition to the lectures and discussion sections.

ACADEMIC DISHONESTY
Any student caught cheating in PSTAT 5LS will be given an 'F' for the course. Further disciplinary measures may be taken. This rule applies to all aspects of the course.

PROCEDURE FOR QUERYING TEST GRADES
Tests will be handed back during section by your TA. Before handing back any Tests, your TA will solve the problems on the board. S/he will then see each of you individually, to look at your Test before handing it back.

Once it has been handed back to you, NO GRADE CHANGES WILL BE MADE UNDER ANY CIRCUMSTANCES.
GRADING
As a general guideline, the grades will be given approximately as follows:

A 20%,
B 30%,
C 40%,
D 10%

If the class performs particularly well, then more than 20% will get an 'A'. If the class performs badly, then fewer than 20% will get an 'A'.

GETTING HELP
If you are having difficulty solving the worksheet problems, see your TA. You have 2 hours of section every week; make full use of it by having specific questions to ask your TA. Your TA also holds office hours.

If you are having difficulty understanding the lectures, see the Instructor during office hours.

Use the Campus Learning Assistance Services (CLAS). CLAS tutors, who are graduate and undergraduate UCSB students, are free of charge to UCSB undergraduate students.

Work with a friend or group of friends.
See the Department website for a list of tutors.

Warning: Private tutors who may offer their services to you. These tutors are not affiliated to, or endorsed by, PSTAT 5LS or UCSB. You are strongly recommended NOT to use them. Students who have used private tutors report that many charge very large sums of money, sometimes do not show up for tutoring sessions, and teach material in ways that are inconsistent with instruction in PSTAT 5LS. In fact, some students report that they failed exams because their private tutor completely misled them.

WORK LOAD
This is a 5-unit course and therefore, according to University regulations, it carries a workload of about 15 hours per week. This includes lectures and sections. The remainder of the time being private study.

CALCULATORS
You will need to learn to use your calculator for arithmetic and some statistical calculations. You will need a calculator that claims to do 'two-variable statistics' or mentions correlation.

Schedule -------------------------------

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SCHEDULE (subject to change – we may not cover ALL this material)

WEEK 1
Introduction. Why statistics is important in the life sciences. Notions of individuals, variables, population, sample and inference. Graphical summaries of variables. Numerical summaries of quantitative variables: measures of center, measures of spread. Introduction to Excel or SPSS. (Ch 1,2 and part of Ch 3)

WEEK 2
Scatterplots, Correlation. Regression. Method of Least Squares. Residuals. (Ch 3, 4)

WEEK 3
Two way tables, Introduction to probability.

WEEK 4
Introduction to probability and discrete probability distributions. (Ch 10)
Friday: MIDTERM 1

WEEK 5
Normal distribution. Binomial Distribution. (Ch 11, 12)

WEEK 6
Sampling distributions. Law of large numbers. Central limit theorem. Confidence intervals for the mean. Hypothesis test for the mean using p-values. (Ch 13, 14)

WEEK 7
Sample size. Power. Type 1 and Type 2 errors. (Ch 14 continued, 15)

WEEK 8
Inference about a Population mean. Two-sample problems. (Ch 17, 18)

WEEK 9
Monday MIDTERM 2.
No classes on Wednesday or Friday (Thanksgiving)
Required Reading during Thanksgiving holiday (not examined in Midterm 2)
Samples and observational studies. Experimental Design: Controls, Replication and Randomized Assignment. Matched pairs and block design. Discussion: Ethics in experimentation. (Ch 7, 8) See Week 9 HW for details.

WEEK 10
Confidence intervals and hypothesis testing for one and two proportions. (Ch 19, 20)
χ² and goodness of fit. (Ch 21)

FINAL EXAMINATION