STATS 8: Introduction to Biological Statistics
Summer Session

Class Meeting Information
This course meets online for 5 weeks of instruction during Summer Session.

Instructor Information

Instructor:
Name: Dr. Brigitte Baldi
Contact: All inquiries must be sent via Moodle. The idea is to recreate a sense of classroom online.
Email: baldib@uci.edu, only to discuss private matters
Office hours and modality: scheduled live WebEx sessions; times listed on Moodle

Dr. Baldi is a lecturer at UC Irvine where she has been teaching statistics for many years. She is also involved in the development of educational material for statistics, from helping to conceive a TV program for distance learning to co-authoring a textbook specifically designed for life sciences applications.

TA:
Name: TBA
Contact: All material and class-related inquiries must be sent via Moodle.
Email: TBA, only to discuss private matters
Office hours and modality: live WebEx sessions; times listed on Moodle

Prerequisites — Classes or Knowledge Required for this Course
None

Course Description
(4 units) Teaches introductory statistical techniques used to collect and analyze experimental and observational data from health sciences, molecular, cellular, environmental, and evolutionary biology. Specific topics include exploration of data, linear regression, probability and sampling distributions, basic statistical inference for means and proportions. Only one course from Statistics 8, Statistics 7, Management 7, or Social Ecology 13 may be taken for credit. (V)
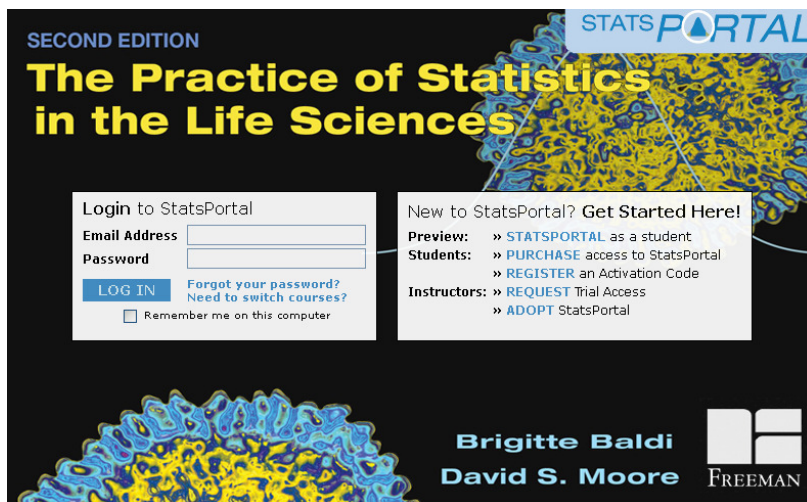
Course Objectives

Our objective is to provide both an understanding of, and hands-on experience with data-driven statistics. This class is similar to a regular statistics class except that we focus on concrete and realistic examples from a wide array of biological problems: from biomedical studies and pharmacology, to ecology and environmental issues, genetics, health, physiology and related socio-economic questions.

By the end of this course, you should be able to:
• analyze and present data
• design experiments and observational studies
• use probabilities to describe and assess random events
• use tests of statistical significance to answer biological and other questions of scientific nature

Course Text or Online Resources

You are required to purchase access to StatsPortal for *The Practice of Statistics in the Life Sciences*, 2nd edition. This can be done at http://www.courses.bfwpub.com/psls2e.php
Make sure to select the right class.

StatsPortal is necessary for completing homework assignments and quizzes. In addition, StatsPortal includes the electronic version of our textbook, step-by-step lessons with Stats Tutor, technology manuals for several statistical software programs and the TI-83/84 calculator, a student study guide, and several other resources.

Because StatsPortal includes the electronic version of our textbook, you do <u>not</u> need to buy a printed textbook. If you really need to scribble on a paper textbook to learn (by the way, the electronic textbook can be annotated and highlighted), you could purchase a used copy of the textbook. Here is the reference:
    <u>The Practice of Statistics in the Life Sciences</u> (PSLS) 2nd edition
    by Brigitte Baldi and David S. Moore
    W.H. Freeman, publisher
There have been several prints of the book and each as a different ISBN. So go by the authors and title.

Other requirements

You must have a TI-83/84 or similar **graphing calculator capable of performing inference tests**. I will demonstrate how to use the TI-83/84. StatsPortal has a manual for the TI-83/84-TI-89 with examples from the textbook. If you have a Casio model, that's fine with me, but you are on your own to learn how to use it. A graphing calculator is necessary because of the in-class mid-term and final exams which do not permit other technology. You may use any calculator or software program of your choice to complete homework and quizzes from your home. In fact, StatsPortal includes the CrunchIt! statistical software program with direct links to the textbook's datasets.

Attendance in-person to our two written exams is mandatory. These exams will take place on the UCI campus. However, if you are not currently located near UCI, the Distance Learning Center can help you find an approved exam center at a university near you. It is **your responsibility** to contact the UCI Distance Learning Center, to make the proper arrangements with the approved test center, and to inform your instructor well ahead of time to finalize these arrangements.

Support

Both StatsPortal and the Distance Learning Center offer technical support free of charge. However, these are not 24h services. So don't wait till the last moment to complete your assignments.

If you need support or assistance because of a disability, you may be eligible for accommodations or services through the Disability Services Center at UC Irvine. For more information, contact the Disability Services Center at (949) 824-7494 (voice), (949) 824-6272 (TTY), at www.disability.uci.edu/incomingstudents, or stop by the center at Building 313 on the UC Irvine map.

Course Outline

Orientation Week ("Week 0")

Orientation	Get acquainted and ready to go
Objectives	By the end of this orientation week, students should be able to: ➢ Navigate around the course site (both on Moodle and on StatsPortal) ➢ Post their self-introduction to a discussion forum on Moodle ➢ Describe the contents of the course syllabus
Assignments	None

Week 1

Lessons No.	1, 2, 3
Lesson 1	Descriptive Statistics - PSLS Chapter 1
Lesson 2	Descriptive Statistics - PSLS Chapter 2
Lesson 3	Correlation, Regression - PSLS Chapters 3 and 4
Method of Instruction	➢ Read textbook or view Stats Tutor for the corresponding chapters on StatsPortal ➢ View/complete Review & Practice lessons on Moodle
Assignments	➢ Homework and quizzes for lessons 1, 2, and 3 on StatsPortal ➢ Help forums for lessons 1, 2, and 3 on Moodle

Week 2

Lessons No.	4, 5, 6
Lesson 4	Producing Data - PSLS Chapters 7 and 8
Lesson 5	Probability - PSLS Chapters 9 and 10
Lesson 6	Normal distributions - PSLS Chapter 11
Project	Project description - No reading or assignment due yet
Method of Instruction	➢ Read textbook or view Stats Tutor for the corresponding chapters on StatsPortal ➢ View/complete Review & Practice lessons on Moodle
Assignments	➢ Homework and quizzes for lessons 4, 5, and 6 on StatsPortal ➢ Help forums for lessons 4, 5, and 6 on Moodle

Week 3

Lessons No.	7 and 8
Midterm	**In person (at UCI or other testing center) – Time and place listed on Moodle**
Lesson 7	Sampling Distributions - PSLS Chapter 13
Lesson 8	Introduction to Inference - PSLS Chapters 14 and 15
Method of Instruction	➢ Read textbook or view Stats Tutor for the corresponding chapters on StatsPortal ➢ View/complete Review & Practice lessons on Moodle
Assignments	➢ Homework and quizzes for lessons 7 and 8 on StatsPortal ➢ Help forums for lessons 7 and 8 on Moodle

Week 4

Lessons No.	9, 10, and 11
Lesson 9	Inference for a Population Mean - PSLS Chapter 17
Lesson 10	Inference for Two Population Means - PSLS Chapter 18
Lesson 11	ANOVA - PSLS Chapter 24
Method of Instruction	➢ Read textbook or view Stats Tutor for the corresponding chapters on StatsPortal ➢ View/complete Review & Practice lessons on Moodle
Assignments	➢ Homework and quizzes for lessons 9, 10, and 11 on StatsPortal ➢ Help forums for lessons 9, 10, and 11 on Moodle

Week 5

Lessons No.	12 and 13
Lesson 12	Chi-square Test for Goodness of Fit - PSLS Chapter 21
Lesson 13	Chi-square Test for Two-Way Tables - PSLS Chapter 22
Method of Instruction	➢ Read textbook or view Stats Tutor for the corresponding chapters on StatsPortal ➢ View/complete Review & Practice lessons on Moodle
Assignments	➢ Homework and quizzes for lessons 12 and 13 on StatsPortal ➢ Help forums for lessons 12 and 13 on Moodle ➢ **Project due by Friday 1pm (Pacific time) in the project submission box (online)**

Finals Week
Final exam – **In person (at UCI or other testing center) – Time and place listed on Moodle**

Evaluation and Grading

In this course, you will be evaluated in the following way:

Final exam (2 hours, in person at UCI)	35%
Midterm (1.5 hour, in person at UCI)	25%
Quizzes total (online, one per lesson)	15%
Homework total (online, one assignment per lesson, graded for completion)	10%
Participation in class forums (online, one help-forum per lesson, graded for effort)	10%
Project (1 written home assignment)	5%
Total	*100%*

Letter grades will be assigned on an adjusted straight scale (that is, grades between 90% and 100% will definitely be in the A range, etc., but the actual cut-offs may be adjusted downward slightly if needed).

Types of Communication

In an online course, the majority of our communication takes place in the course forums visible to all. However, when we have a need for communication that is private, whether personal, interpersonal, or professional, we will use individual email.

Code of Conduct

All participants in the course are bound by the University of California Code of Conduct, found at http://www.ucop.edu/ucophome/coordrev/ucpolicies/aos/uc100.html.

Netiquette

In an online classroom, our primary means of communication is written. The written language has many advantages: more opportunity for reasoned thought, more ability to go in-depth, and more time to think through an issue before posting a comment. However, written communication also has certain disadvantages, such a lack of the face-to-face signaling that occurs through body language, intonation, pausing, facial expressions, and gestures. As a result, please be aware of the possibility of miscommunication and compose your comments in a positive, supportive, and constructive manner.

Course Policies

Expectations of students: I expect you to

- keep up with the material covered every week
- complete your homework and quizzes on time every week
- produce a project report reflecting your own work and submitted on time
- participate actively and courteously in the forums
- abide by the standards of academic honesty and student code of conduct
- seek help (instructor, TA, or homework forums) when you don't understand a topic
- aspire to enjoy learning about statistics – yes you can and I'll do my best to help!

Expectations of the instructor: You can expect me to

- provide comprehensive learning material on time every week
- provide scheduled live online office hours
- provide an ongoing help forum, check it at least three times a week and respond to student postings
- create quizzes and exams that reflect the stated learning expectations for the course
- show you how important statistics is by using real examples and data sets
- do my best to get you to appreciate and enjoy statistics!

<u>Miscellaneous</u>

- Beware that Moodle and StatsPortal are two separate systems requiring separate accounts and logins. **You obtain your Moodle enrollment key from Summer Session in an email** (either when you enroll for class or at the start of week 0 if you enrolled early). Instructions on how to create a Moodle account and use this enrollment key are provided in the email by Summer Session. **Access to StatsPortal, on the other hand, requires that you purchase access on the StatsPortal website**. If you have any problem with this process, contact the StatsPortal help line immediately. Make sure to create your Moodle and StatsPortal accounts during week 0, to avoid delays when instruction and assignment deadlines begin.

- Learning the material in this course involves first reading the textbook or viewing the Stat Tutor lesson, followed by viewing the Moodle lesson, and then completing the assignments (homework, discussion forum, quiz) for this lesson.

- Homework is posted on StatsPortal where it must be completed and submitted. Homework is due weekly by Monday morning 8 am Pacific time (set your StatsPortal to Pacific time to avoid confusion). No excuse for late submission will be accepted, short of a medical emergency or the like.

- Your homework is graded for completion, based on an **average** accuracy rate of no less than 70% per assignment (for ex., if you got an assignment average of 72% correct, you get full credit for that assignment). StatsPortal allows you to save half-way through, and to complete and submit the assignment several times (so, if you did poorly the first time around, you can do it again to improve your skills and raise your **average** score so as to obtain full credit).

- You are required to participate in the online discussion forums on **Moodle**. This is a way to ensure that you seek help and that you may learn by helping others too. Actually, the most effective way to learn something is having to teach it. There is one forum for each lesson. Participation is graded weekly on a Pass/NoPass basis (based on effort).

- When you are comfortable with the material of a given lesson, it is time to take the lesson quiz. Quizzes are posted on StatsPortal, along with the homework. However, quizzes can be completed **only once** and your score is recorded to count toward your class grade. The deadline for each quiz is given in the quiz instructions on StatsPortal. Again, no excuse for late submission will be accepted, short of a medical emergency or the like.

- There are **no make-up exams**. If you must miss an exam, please contact me as far in advance as possible to discuss alternate arrangements. Any special arrangements for exams or submitting assignments will be made entirely at the instructor's discretion.

- **No grade pleading will be entertained. Your grade is exclusively your responsibility.** Work hard right from the beginning. Every little bit helps, so don't miss assignment deadlines. Deadline extensions can be given only when an unusual circumstance is discussed well before the deadline (except, of course, for a sudden illness or other documented event). An "Incomplete" grade can be given for truly extraordinary circumstances as per UCI guidelines.

- All material and class-related inquiries must be sent **via Moodle**. The idea is to recreate some of the classroom benefits in the online experience. Typically, when one student asks a question, others have the same question on their mind. Sharing questions and answers is a way to help each other.

- Circumstances of a private nature may arise that you need to discuss exclusively with the instructors (such as, "I'm at the hospital with appendicitis and won't be able to finish the assignments in time."). For such situations, contact the instructor and TA in a joint email (baldib@uci.edu; TA TBA).