SYLLABUS

Bio 260, Summer 2016

BASICS

This course is Bio 260 Biostatistics, a preliminary course designed for biology students. The course meets Mondays, Tuesday, Wednesdays and Thursdays from 9:00 to 10:20 in HSCI 105. Concurrent enrollment in a lab section is also required. Course begins July 5, last class meeting is August 11, Final exam is during the last lecture period.

The instructor for this course is Dr. Ashley Carter (MICR 010, ashley.carter@csulb.edu).
Office hours are:

- Tuesdays 10:30-11:30
- Wednesdays 10:30-11:30

The course catalog describes this course as: "Use of probability and statistics in the description and analysis of biological data."

The format of the course is lectures using a student response system, one physical homework assignment and three exams. Details of the format and style of these are described in more detail on the appropriate pages of the course website.

BEACHBOARD?

The specific functions of CSULB Beachboard will be little used for this course, all documents and materials will be distributed via the course website:

www.csulb.edu/~acarter3/course-biostats

This website is accessible from within Beachboard from the course page AND by the HTTP address just like a regular website.

TOP HAT MONOCLE SYSTEM

Periodically during lectures questions will be asked and student answers will be submitted using the Tophat Monocle system. This system allows answers to be submitted by texting using a web-connected device with a web browser or via the student's cell phone. All students must sign up for (and unfortunately pay) for a membership option to use this system. This is essentially like the iClicker system you may be used to, but with the ability to provide vocabulary words and numerical answers as well as multiple choice answers.

- To sign up for an account go to the following website:
  https://app.tophat.com/login/648485
- The ID number for this course is: "648485"
- Their support page with videos on how to use the system is:
  https://support.tophat.com/hc/en-us/categories/200000744-Student-Orientation

If you do not have a cell phone or wireless device you may complete your answers on paper, but you will be required to sit in the front row to ensure that cheating does not occur.
TEXTBOOKS and READINGS

There is a lab manual **required** for this course. This is a bookstore copy center product:

- Archie, James W., Bray, Richard N. Laboratory Manual for Biostatistics.

This lab manual is very detailed and has long introductory sections before the labs. The lectures are designed to follow the order of topics closely - consider this to be more than just a manual for lab, this is useful for the lecture as well. You should keep this after the course is over to serve as a reference for your future.

The hardcover textbook for this course is **strongly recommended**:


The book is mainly intended to supplement the lecture and lab material, making concepts clearer via the author’s alternative presentation. The book listed is excellent. In the past I have told students that using an alternate text is just fine, but based on reading many texts over the years, this one is by far the best and you should keep it after the class to use as a reference in future courses.

Each of the first three exams include questions on short online readings or research articles that will be posted either as links to websites or PDFs. The links are on both the "Lectures" and "Exams" pages.

**SCHEDULE OF LECTURE TOPICS**

The course is divided into essentially three sections, each corresponding to several topics in the book and labs in the lab manual. Lectures will not necessarily strictly follow the order of topics in the chapters within each section, but will cover much of the material while adding additional material not in the texts. You should read all the chapters for each section as soon as you can when we begin that section.

--- Section 1 ---

- Text: chapters: 1, 2, 3, 5, 7 and interleaves 2, 5.
- Topics covered: statistics/parameters, samples/populations, visualizing data, descriptive measures, probability, binomial distribution, Poisson distribution, normal distribution.
- **Homework** due Tuesday, July 6
- **Exam I** Thursday, July 14

--- Section 2 ---

- Text: chapters 4, 6, 8, 9, 10, 11, 12, 13, 14 and interleaves 3, 6, 8.
- Labs: 8-11.
- Topics covered: distribution of sample mean, confidence intervals, hypothesis testing, p value, one-sample t-test, two-sample t-test, F-test, chi-square and goodness of fit tests.
- **Exam II** Thursday, July 28

--- Section 3 ---

- Chapters: 14, 15, 16, 17 (18, 19, 20, 21 in less detail) and interleaves 4, 7, 10.
- Labs: 12-16.
- Topics covered: one-way ANOVA, two-way ANOVA, regression, correlation, non-parametric tests, computer-based statistical simulation.
- **Exam III** Thursday, August 11
SCHEDULE OF LAB TOPICS

The overall lab portion of the course is divided into two main parts, each corresponding to several chapters in the lab manual book and with an exam covering the material in each.

- There are two exams, each worth 10% of your overall course grade.
- There are four quizzes, each worth 2% of your overall course grade.
- Attendance and participation in each of the five lab sections in which quizzes and exams do not occur is worth 1% each. Being late can also result in the loss of this 1%. Leaving after a lab quiz and not returning to complete the lab activities will also incur a 1% penalty.

Missing a lab is missing a part of the education provided in the course and your grade is lowered to reflect this reduced learning. Under exceptional circumstances excuses may be accepted, but proof must be shown and if the circumstance is known beforehand, excuses after the fact will not be accepted.

The lab is therefore worth 33% of your overall course grade.

Your lab exam and quizzes may be scaled using the same method as used for lecture items.

--- Part I ---

July 6:
- Lab #1: Summation Notation, MiniTab
- Lab #2: Measurement Accuracy and Precision in Biology
- Lab #3: Descriptive Statistics

July 11:
- QUIZ on labs #1-3
- Lab #4: Probability and Random Sampling
- Lab #5: The Binomial Probability Distribution

July 13:
- Lab #6: The Poisson Probability Distribution
- Lab #7: Normal Populations and Z-Scores

July 18:
- QUIZ on labs #4-7
- Lab #8: Confidence Intervals for Population Parameters
- Lab #9: One-Sample Hypothesis Tests about u

July 20:
- EXAM on labs #1-#9

--- Part II ---

July 25:
- Lab #10: Test of Equality of Two Population Variances
- Lab #11: Independent Two-Sample Design Tests
July 27:

- Lab #12: Analysis of Frequency Tables

August 1:

- QUIZ on labs #10-12
- Lab #13: One-Way Analysis of Variance (One-way ANOVA)

August 3:

- Lab #15: Two-Factor Completely Randomized Design (Two-Way ANOVA)

August 8:

- QUIZ on labs #13 & #15
- Lab #16: Regression and Correlation

August 10:

- EXAM on labs #10-16

GRADING

Only traditional grading (A, B, C, D, F) is available.

- There are three exams. Each exam is worth 18% of your final grade.
- There is 1 homework assignment. The assignment is worth 3% of your final grade.
- Periodically during lectures students will be asked to submit answers to questions using the Top Hat Monocle student response system, the total score of these answers is worth 10% of your grade.
- Your overall lab grade is worth 33% of your final grade.

The final grade will be determined using a 90-80-70-60 scale. The instructor may reduce the final required score needed to earn course grades at his discretion (i.e., "curve up"), but this is not guaranteed.

Individual assignments and exams may be "curved." In the event that the class mean for an assignment or exam is below 75% and the instructor determines that rescaling the scores is appropriate, individual grades will be rescaled by adding points sufficient to move the mean score to 75%.

Exams and assignments must be completed in pen (except any scantron portions of course). Items completed in pencil cannot be submitted for regrading. Student may not leave during the exam to use the restroom, leaving the room requires exam completion and submission.

Details of the format and style of the exams and assignments are described in more detail on the appropriate pages on the course website. Details of the lab grades will be described in more detail by the TA in lab.

Extra credit is available for this course. After each of the three exams the multiple choice section will be posted online, you may redo the multiple choice section and hand in completed scantron forms at the next class meeting (or to my mailbox by 12:00 the next day for the third exam). These submissions will be graded and all students receiving whatever the highest score is will receive an additional 1% added to their final course grade. You must take this seriously (i.e., don't waste my time grading), any students scoring below 60% on the resubmitted scantron will have 1% deducted instead.
TECHNICAL STUFF

EXAM AND ASSIGNMENT PROCEDURE

- Calculators are provided for you during the lecture exam, you **may not** use your own calculator, any other electronic device or any notes.
- Leaving the room during the exam for any reason requires that you submit your exam, bathroom breaks are not allowed.
- Exams and assignments must be **completed in pen**, submissions in pencil will not ever be considered for regrading and may (at the discretion of the instructor) receive no credit.
- There are usually multiple "forms" for exams and assignments collected in different boxes. The submitted item will be graded against the key for the box it is submitted to. **Be careful when submitting** to make sure you use the correct box.
- The assignment will be collected at the beginning of the class period, if you are late to class you will be unable to submit your assignment.
- Exams must be submitted promptly when the verbal notification that time is up is made, excessive delay in submitting the exam may result in the exam receiving no credit.
- There is **no makeup exam** for this course, see below.

ATTENDANCE POLICY

Attendance is not required for the lecture; however, the instructor takes no responsibility for information or notifications that are missed as a result of student absence. Attendance during exam periods is required for completion of the exams.

**Attendance is required for the labs.** Lab instructors have the authority to lower the grades of students who miss labs, walk out and only return at the end of labs or leave early without showing a serious effort. In addition to using participation as part of their grading system they may submit names of students that they feel should not have their lab scores scaled upwards - this may result in considerably lower lab grades for these students. Biology courses with labs have limited enrollments and every semester I must deny students enrollment due to labs being full; I have little sympathy for students who deny slots to other students and then don't take their studies seriously.

LATE ASSIGNMENT POLICY

The assignment may not be turned in after the start of class on the due date. Tophat questions missed because of being late or due to electronic device failure are zeroes, make sure you understand how to operate the system and are on time to class.

MAKEUP EXAM POLICY

There is no makeup exam for this course. The score for a missing exam will be replaced by the lowest unscaled score from the other two IF valid documents showing proof of the cause of the absence are provided WITH a signed and legally notarized affidavit stating the circumstances within 48 hours (no exceptions). Missing two exams would result in a score of zero for the second exam missed and is one of the most effective ways to fail the class.

SPECIAL ACCOMMODATIONS

In certain cases students require special accommodations regarding exams or other activities.

- **Religious issues:** religious holidays and constraints are valid excuses as far as scheduling activities is concerned and special accommodation may be made for these. However, religious are knowable beforehand, special accommodation for such issues will only be made if the instructor is notified in advance. Religious excuses after the fact are not acceptable.
- **Emergencies:** by their nature emergencies are not knowable beforehand; however genuine emergencies are documentable in written form (e.g., police report, mechanic's bill, obituary notice, medical papers, legal records). Special accommodation for such issues will only be made if written documentation of the emergency is provided as soon as possible.
- **Learning disabilities:** if you have a genuine learning disability special accommodation may be made. It is the student's responsibility to provide written proof of the status and research the options available at CSULB regarding this issue. Additionally, the student must notify the instructor in advance if they plan to request special accommodations due to a learning disability. Information on the CSULB resources available for learning disabled students is available at: [www.csulb.edu/divisions/students/dss/programs/stephen_benson_program](http://www.csulb.edu/divisions/students/dss/programs/stephen_benson_program)

In all cases the burden of arranging for the accommodations lies with the student.
DISHONESTY AND CHEATING

Cheating fundamentally harms the fairness of the educational process and will not be tolerated in this course.

- The assignments may be completed in collaboration with other students (I.E., a study group), but the answers you submit should be your own.
- **This instructor has given failing course grades to students who have cheated on tests and plagiarized on assignments/essays in the past. He also follows up on this by writing letters to academic affairs recommending the expulsion of these students from CSULB. Heed the following information carefully.**
- To minimize the potential for cheating, the following policies apply to exam periods.
  - You must complete the non-scantron portion of exams in PEN, not pencil.
  - You may not use your own calculator, one will be provided to you.
  - You may not use any notes during exams, all exams are closed-note, closed-book.
  - You may not leave the room during the exam (even to use the restroom), if you leave you must submit your exam for grading. Plan ahead and don't drink too much before the exam.
- CSULB has a written policy on cheating and plagiarism. This information includes definitions of cheating and plagiarism, the rights and responsibilities of students and instructors in courses, and the procedures for conflicts arising from enforcement of these policies. I strongly advise all students to read this information, available at:
  - [http://www.csulb.edu/divisions/aa/research/our/information/policies/cheating/](http://www.csulb.edu/divisions/aa/research/our/information/policies/cheating/)

WITHDRAWAL AND DROP DATES

Due dates for drops and withdrawals can be found here:
- [http://web.csulb.edu/depts/enrollment/summer/index.html](http://web.csulb.edu/depts/enrollment/summer/index.html)
It is your responsibility to make yourself aware of these dates.

CNSM REQUIRED TEXT

The Dean of the college of CNSM has requested that the following text be included on all syllabi:

- No instructor or office staff can add or change a class for you. Only YOU, THE STUDENT, can add or change classes in YOUR schedule. You may either add classes on-line through your MyCSULB account or in person at Enrollment Services during the registration period.
- Each student is responsible to check their MyCSULB account weekly to be certain that the Class Schedule listed accurately reflects the courses s/he is enrolled in for the current semester. Students should also check for any notices the University has sent to them.

The Dean of the college of CNSM would also like you to be aware of the safety information described in the PDF below. I strongly recommend reading through it, but the most important single piece of information is that calling "911" on your cell phone will connect you somewhere far off-campus. You should call "562-985-4101" instead for campus police. You should program this into your cell phone.

- [CNSM-Training-Emergency-Info.pdf](http://www.csulb.edu/divisions/aa/research/our/information/policies/cheating/)