

California State University, Los Angeles
Department of Biological Sciences
BIOL 3000 – Biostatistics
Fall 2019

COURSE INFORMATION

Instructor Information

Instructor: Serj Danielian, MS, PhD student

Office Location: BIOS 236

Email: sdanie10@calstatela.edu

Office Hours: In person: *Th 10:00-11:00 am*

*Online on Zoom: Fri 3-4 pm, See Canvas for instructions and link to the meeting room.
Simply click on the link to join the instructor.*

Prerequisites: Grade of C or higher in BIOL 1200; calculus ready

Class Days/Time/Location: (see your specific section number)

Subject	Section			Lec Start	Lec End	Days	Location
BIOL 3000	01	LEC	Biostatistics	8:00 AM	08:50 AM	TuTh	SH 242
BIOL 3000	02	Lab	Biostatistics	Online	Online	Online	Online
BIOL 3000	03	LEC	Biostatistics	9:00 AM	09:50 AM	TuTh	BIOS 247
BIOL 3000	04	Lab	Biostatistics	Online	Online	Online	Online

* Labs online

Course Description

The purpose of this course is to apply Statistical analysis to biological problems, with emphasis on sampling, experimental design, chi-square analysis, t-test, analysis of variance, regression analysis, and correlation analysis.

Course Objectives/Outcomes

By the end of this course, students should be able to:

1. recognize various types of data
2. summarize data effectively using plots and descriptive statistics
3. choose the correct statistical analyses for a variety of experimental situations
4. use Excel and R software to carry out statistical analyses
5. interpret correctly the results of statistical analyses produced by software and that appear in scientific literature.

REQUIRED COURSE MATERIALS

Textbook

OpenIntro Statistics, 3rd edition by Diez, Barr, and Çetinkaya-Rundel; ISBN: 9781943450039. This open-source textbook is available at no cost as a PDF here: <https://www.openintro.org/download.php?file=os3>. Printed copies may be rented or purchased at low cost from the campus bookstore or Amazon.

Other Readings

Outline of Lecture material will be posted on Canvas.

Other equipment / material requirements

Materials: Scientific calculator, three 882 E scantrons

Software Requirements (Excel, Word, R, RStudio): You are expected to have these 4 software installed on your personal computer. See **General Course Information** section on Canvas on how to download these software. Excel and Word are free of charge to continuing CSULA students, while R & RStudio are free for everyone to download. Subsequently, you may use CSULA Open Access Labs (OALs) to complete your class assignments. See the [OALs link](#) for location and operating hours of these labs.

COURSE POLICIES

You must attend all lectures. A written medical excuse is required to miss an exam. There are no physical meetings required for the labs. All lab assignments must be submitted online.

Course Structure

This course is to be conducted in hybrid format. Lecture content is face-to-face, while the Labs are online. You will participate in the course using Cal State LA learning management system, [CANVAS](#)

Computer Requirements

You will need to have weekly access to a Windows or a Mac machine. Unfortunately, tablets and Chromebooks are not compatible with some of the software we will be using in this class.

Software Requirements (Excel, Word, R, RStudio): You are expected to have these 4 software installed on your personal computer. See **General Course Information** section on Canvas on how to download these software. Excel and Word are free of charge to continuing CSULA students, while R & RStudio are free for everyone to download. Subsequently, you may use CSULA Open Access Labs (OALs) to complete your class assignments. See the [OALs link](#) for location and operating hours of these labs.

You will need to have an up-to-date browser, operating system and some additional software on your computer to take this class. Check the [ITS Helpdesk Student Resources page](#). Some of the documents in this course will be available to you in PDF

form. You will need download and install [Adobe Acrobat Reader software](#) on your computer.

ASSIGNMENTS AND GRADING POLICY

Exam Format: Closed book. Part I (30%) is based on multiple choice questions. Part II (70%) is based on problem solving. You may prepare and use one sheet of formulas (*must be had-written and you may use both sides of the sheet*). The statistical tables will be provided for you during Part II of the exam. **Required materials** are a scientific calculator, three scantrons (regular 882 E form), a single-page cheat sheet for formulas (must be had-written), a pencil for the scantron, and an optional pen. See class schedule for exam dates. **Make-up exams will not be allowed without prior permission of the instructor.** Exams 1 and 2 are 100 points each, and the Final Exam is 200 points. The Final Exam is cumulative.

Homework: There will be a total of six homework (HW) assignments, each is worth 15 points. These assignments will be graded automatically on Canvas, and the lowest HW score will be dropped. Assignments must be done individually. After solving the HW problems by hand, you must enter the answers on a multiple choice format on Canvas. **Late homework assignments will not be accepted, no exceptions.** Due dates are given in lecture and posted on *Canvas*.

Pre-Exam QnA: These are pre-exam conceptual questions that you will be asked to complete before each exam. Due dates are given in lecture and each complete QnA is worth 10 points. These questions are designed to help you study for the three Exams. You should download the pdf documents before each exam, choose the correct answers to the best of your knowledge, and enter these answers on the subsequent links on Canvas. **Late QnA assignments will not be accepted, no exceptions.**

Laboratory: The laboratory portion of this course will be held online. Each laboratory will have a computer-based assignment (10 points each). All assignments must be completed and uploaded to the instructor using *Canvas* on the due date. **Late lab assignments will not be accepted without prior permission of the instructor.** The lowest Lab assignment grade will be dropped.

Extra Credit The details and the due date will be announced in class (10 extra points available).

GRADING CRITERIA

Points Possible

Assignment	Points
Exams (3)	400
HomeWorks (6, drop lowest score)	75
Pre-Exam QnAs (3)	30
Lab Assignments (12, drop lowest score)	110
Extra Credit	10
Total:	615

Grading Scale

	A	≥ 92%	A–	88.00% - 91.99%
B+	B	80.00% - 83.99%	B–	76.00% - 79.99%
C+	C	67.00% - 71.99%	C–	63.00% - 66.99%
D+	D	55.00% - 58.99%	D–	51.00% - 54.99%
	F	< 50.99%		

Grades

You can view your grades using the GRADES button in the course navigation links. Please check your grades regularly to make certain that I have received all your assignments. If you have a question about a grade, email me at sdanie10@calstatela.edu. Please do not post your personal concerns in a discussion forum.

COURSE COMMUNICATION

Interaction with Instructor

Questions can be sent to the Instructor via email sdanie10@calstatela.edu.

As a student, you should expect to receive assignment feedback and responses to postings within 48 hours. The Instructor will post an announcement alerting the students if he will be unavailable for more than a day.

Questions

In online/hybrid courses it is normal to have many questions about things that relate to the course, such as clarification about assignments, course materials, or assessments. Please email me your questions at sdanie10@calstatela.edu and please follow the emailing format (see below) when contacting me about Lab assignments.

Turnaround/Feedback

During the week (M-F) I will check *emails* multiple times. If you have a concern and send me an email message, you can expect a response within two days.

Emailing format: You should include the following information when contacting the instructor about any of the lab assignments:

1. Your name, Section number.
2. The problem you are working on. Include page number, problem number.
3. Include the line of code you have used. (do not include multiple versions of the same code)
4. Include the Error message you have received.
5. If you have multiple questions, repeat step 2-4 for every question.

HELPFUL STUDENT RESOURCES

Technical Resources

Information on CSULA technical support resources for students: [Technical Support](#)

Student Support Services

Information on CSULA student support resources for students: [Student Services](#)

Academic Support Services

Information on CSULA academic support resources for students: [Academic Support](#)

Canvas Student Support

Information for students on how to be a successful online student and how to use Canvas: [Canvas Community Guides for Students](#) | [Canvas Student Tour Course](#)

COURSE & UNIVERSITY POLICIES

Student Handbook

Information on student rights and responsibilities, academic honesty, standards of conduct, etc., can be found in Schedule of Classes for the current quarter visit the Cal State LA [Schedule of Classes Information](#) under Policies and Procedures.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Students should be aware of the current deadlines and penalties for adding and dropping classes by visiting the [GET home page](#). (Registrar news and information)

Americans with Disabilities Act (ADA)

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. For more information visit the [Office for Students with Disabilities](#) home page.

Academic Honesty/Student Conduct

Academic Honesty: Many incidents of plagiarism result from students' lack of understanding about what constitutes plagiarism. However, you are expected to familiarize yourself with Cal State L.A.'s policy on plagiarism. **All work you submit must be your own scholarly and creative efforts.** Cal State L.A. plagiarism as follows: "At Cal State L. A., plagiarism is defined as the act of using ideas, words, or work of another person or persons as if they were one's own, without giving proper credit to the original sources."

Here is the link to [Cal State LA Policies and Procedures on Academic Honesty definitions](#).

Student Conduct: [Appendix E - Student Conduct / Student Conduct Procedures](#) will be used as a reference to address student code of conduct in Cal State LA.

COURSE OUTLINE/SCHEDULE OF ASSIGNMENTS

Face-To-Face Lecture Schedule (*subject to change)

Dates	Topic	Reading
Aug 20, 22, 27	Types of data; descriptive statistics; visualization	§1.1–1.7
29, Sep 3, 5, 10, 12	Probability and probability distributions	§2.1–2.4, 3.1, 3.4–3.5
Sep 17, 19	Central limit theorem; confidence intervals	§4.1, 4.2, 4.4
Sep 24, 26, Oct 1	Hypothesis testing	§4.3, 6.1
Oct 3	Exam I (100 points)	
Oct 8, 10, 15	Student's <i>t</i> -tests	§5.1–5.3
Oct 17, 22	One-factor analysis of variance (ANOVA)	§5.5
Oct 24, 29	Two-factor ANOVA; Interaction	Handout
31, Nov 7, 12, 14, 19	Chi-square tests; contingency tables	§6.3, 6.4
Nov 5	Exam II (100 points)	
Nov 21, Dec 3, 5	Regression and correlation	§7.1, 7.2, 7.4

Final Exam: section 01: TBA, (SH 242)

Final Exam: section 03: TBA, (Bios 247)

Final exam is comprehensive.

Online Laboratory Schedule (*subject to change)

(Labs are due on **Fridays 5 pm**, except for Lab 12*)

Lab	Week	Dates	Topic	Lab Due, 5 pm
	1	8/19 - 8/23		
1	2	8/26 - 8/30	Simple descriptive statistics	8/30/19
2	3	9/2 - 9/6	Introduction to R	9/6/19
3	4	9/9 - 9/13	Discrete probability distributions	9/13/19
4	5	9/16 - 9/20	Normal distribution; central limit theorem	9/20/19
5	6	9/23 - 9/27	Introduction to data	9/27/19
	7	9/30 - 10/4		
6	8	10/7 - 10/11	Hypothesis testing; test for proportions	10/11/19
7	9	10/14 - 10/18	Student's <i>t</i> -tests	10/18/19
8	10	10/21 - 10/25	One-factor ANOVA	10/25/19
9	11	10/28 - 11/1	Two-factor ANOVA	11/1/19
	12	11/4 - 11/8		
10	13	11/11 - 11/15	Chi-square tests for categorical data	11/15/19
11	14	11/18 - 11/22	Contingency tables	11/22/19
	15	11/25 - 11/29		
12	16	12/2 - 12/6	Regression & correlation analysis	12/6/19