SOUTHERN CALIFORNIA UNIVERSITY OF HEALTH SCIENCES
Accelerated Sciences Division

Syllabus Table of Contents

COURSE INFORMATION

Course Number (Prefix Code): BIO401

Course Name: Biostatistics

Course Description:

This course in Applied Basic Biostatistics offers a practical application of fundamental statistical concepts and methods using computer software in solving biological and health-related problems. A variety of topics, including understanding of variable types and measurement levels, descriptive statistics (graphical and numerical summaries), principles of probability/probability distribution and statistical inferences involving bivariate analyses (such as independent sample t-test, paired sample t-test, one-way ANOVA, correlations/ simple linear regression and chi-square test/binary logistic regression) will be covered. Using a hands-on problem-based learning (PBL) approach, the course equips learners with the tools for understanding and analyzing data and interpreting results using statistical software such as SPSS, without requiring prior computing experience.

Course Delivery Model(s): Online

Time Requirement:

Lecture Hours per term:	45
Laboratory Hours per term:	0
Total Hours per term:	45
Course Duration (weeks):	5
Credits:	4

Credit Hour Verification:

This list represents the average amount of time a student is expected to spend to successfully complete this course.

	Activity Type	Online (Self-paced) Hrs/wk
Course Time	Lecture	4 hours
	Discussion forums	1 hour
	Audio/Video recordings	8 hours
	Quizzes (outside of class)	2 hours
	Homework	3 hours
Preparation and Study	Study (assessment prep)	4 hours
	Reading	4 hours
Other	Exams (outside of class)	1 hour
Total	Total per week	27 hours
	Total per course	135 hours

Prerequisites: None
Co-requisites: None

This course may be taken again for credit the following number of times (repeatable): 5

LEARNING OUTCOMES, OBJECTIVES, & ALIGNMENT

Student/Course Learning Outcomes
In successfully completing this course, the student will be able to:

SLO/CLO
1. Apply principles of scientific reasoning, statistical inference, and research design to the social, behavioral & life sciences.
2. Analyze quantitative & qualitative data using appropriate biostatistics techniques (such as one sample and two independent sample t-tests, Correlation/Regression analysis, Chi-square tests and Analysis is of Variance) and computer-based software such as SPSS.
3. Interpret results of data analysis for social, behavioral & life sciences research.
4. Communicate results of a statistical analysis in an audience-appropriate context, through both written & oral presentation.

TEXTBOOKS & MATERIALS
Required Textbook(s): The Practice of Statistics in the Life Sciences by Brigitte Baldi and David S. Moore (4th edition), Macmillan Learning ISBN-13: 978-1219013370.

Recommended Textbook(s):
Intermediate Statistics Using SPSS. Herschel Knapp. © 2018, SAGE Publications, ISBN: 978-1-5063-7743-8
https://methods.sagepub.com/book/intermediate-statistics-using-spss

Required Materials: Working on a computer with strong internet connection. SPSS, Scientific calculator.

Provided Materials: The following materials will be provided for you: Homework and quizzes platform available on Macmillan/Achieve.

Technology requirements:

External resources: Macmillan/Achieve

Learning Management System: Canvas. If a student is unfamiliar with the Canvas learning management system, please visit the manuals and learning guides available in the Canvas Student Guide. It is important that students are comfortable and competent in using this system, as all course material and communication will be done via Canvas.

Navigating Canvas – the Canvas site has a large set of Canvas tutorials and videos for students.

Browser and Computer Requirements for Canvas: This course requires that students have access to Google Chrome or Microsoft Edge.

Examination System: We will be using the Online Exam Proctoring Service in this course. Respondus is a software extension in Chrome or Microsoft edge that uses your computer's screen, web cam, and microphone to create a remote proctored environment, and enables you to take exams via Canvas in the location of your choice. You must have a strong and stable internet connection for Respondus to work well. During the exam, you, your computer, and the environment you are taking the exam in may all be recorded.

In addition to the instructor(s) and Teaching Assistants(s) of this course, Respondus and SCU Respondus administrators are the only ones who will have access to the recordings. The Chrome browser extension must be installed before students can take any exam, and it can be removed once an exam is complete.
There will be a practice exam to become familiar with using Respondus, and surface any issues you may encounter with Respondus.

Suggestions for completing online coursework: Save work often; this includes backing it up on multiple devices or cloud applications. When submitting final papers on the Canvas learning management system (LMS), ensure that all files have been uploaded properly. Also make sure to keep a hard copy of all papers/projects in case of an unforeseen technological failure or outage.

EVALUATION OF STUDENT LEARNING

Grading scale:

Letter grade
A = 90% - 100%
B = 80% - 89.99%
C = 70% - 79.99%
D = 60% - 69.99%
F = 0.0% - 59.99%

Assessments:

Assessment Name	# of assignments	Weight	SLO Linkage
Homework	5	10%	1,2,3,4
Discussion	5	10%	1,2,3,4
Quizzes	5	20%	1,2,3,4
Teamwork	5	20%	1,2,3,4
Final Project	2	40%	1,2,3,4

Course Topics:

Week	Topic	Assessment Activity	SLO Linkage
1	Introduction: Introduction to SPSS Introduction to Statistical Data Variable Types and Measurement levels Descriptive statistics: Graphical and numerical summaries (Chapter 1&2, 8)	Homework#1 (Dues Thursday) Discussion#1 (1st Prompt Due Thursday; Response due Sunday) Teamwork#1 (Due Sunday) Quiz#1 (Due Sunday)	1 1, 2,3, 4
2	Introduction to Probability The Normal Distribution Introduction to Statistical Inference: Estimation and Hypothesis Testing (Chapter 8, 11, 14, 15)	Homework#2 (Dues Thursday) Discussion#2 (1st Prompt Due Thursday; Response due Sunday) Teamwork#2 (Due Sunday) Quiz#2 (Due Sunday)	1, 2,3, 4
Project Part 1 Due Sunday of Week 2			
3	Inference about Population Means (1 sample -t-test, 2 independent sample t-tests, paired t-tests) One-way ANOVA Chapter 17, 18, 24	Homework#3 (Dues Thursday) Discussion#3 (1st Prompt Due Thursday; Response due Sunday) Teamwork#3 (Due Sunday) Quiz#3 (Due Sunday)	1, 2,3, 4
4	Correlations & Simple linear regression (Chapter 3,4, 23)	Homework#4 (Dues Thursday) Discussion#4 (1st Prompt Due Thursday; Response due Sunday) Teamwork#4 (Due Sunday) Quiz#4 (Due Sunday)	1, 2,3, 4
5	Chi-square Test & Binary Logistic Regression	Homework#5 (Dues Thursday) Discussion#5 (1st Prompt Due	1, 2,3, 4

	(Chapter 22, 28)	Thursday; Response due Sunday) Teamwork#5 (Due Sunday) Quiz#5 (Due Sunday)	
	Project Part 2 Due Sunday of Week 5		

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UNIVERSITY POLICIES

All university policies apply to this course and all others. For full policy information please consult the SCU Catalog. Additionally, program policies apply to students in each program as described in the Catalog and in SCU Health Handbook for clinical courses.

Drop Date: It is a student's responsibility to understand when to consider unenrolling from a course. Refer to the SCU Academic Calendar for dates and deadlines for registration. Also refer to SCU Academic Policies for information about the drop period.

Incomplete Policy: Under emergency/special circumstances, students may petition for an incomplete grade. See the SCU Catalog for Policies about Incomplete Grades

Academic Integrity: Students at this university are expected to maintain the highest degrees of professionalism, a commitment to active learning, and display integrity both in and out of the classroom. See the SCU SCU Academic Integrity Code.

Accessibility Services and Accommodations: The Office of Student Services provides support to students with disabilities requiring accommodation in concert with the lead faculty for this course. All students are encouraged to request accommodation as far in advance of when the accommodation will be required to allow the University to process the request and provide approved accommodation. To begin the process please request a consultation with the designated Accessibility Services Officer as soon as possible. Once the Office of Student Services approves the request, the letter of accommodation will be provided to the student and lead faculty member via email. The student should be certain to follow-up with the lead faculty member to plan for the specific accommodation needs for the course. Program requirements cannot be modified to accommodate a disability.
Please see the catalog for details regarding Accessibility Services and Accommodations.

A complete list of University Services is available through MySCU, including:

- Tech Support information
- Veterans Support Services
- Resources for Title IX support though the Campus Safety tab
- Student Advocacy and Accountability resources

Learning Resource Center: Students can use the library's resources which provide students with an excellent collection of books, journals, electronic databases, and websites as well as consult with the librarian to help with the course.

Online Etiquette: In general, behavior in an online classroom should emulate the professional behavior expected in an on-ground classroom with a few additional requirements:

- Avoid using text slang and abbreviations such as "u" (instead of "you"), "TLDR" (Too Long, Didn't Read) or "TBH" (To Be Honest) - not everyone knows what they are. Do not use ALL CAPS for entire sentences or posts - this is seen as yelling at someone.
- Any form of personal attack or inappropriate response with other students or faculty is unacceptable. We will remove any discussion posts showing this and warn the author.
- If a student disagrees with someone's comments, they should do so respectfully and collegially and provide legitimate examples to support their side.
- Before pressing the submit button review comments, making sure nothing is coming across as defensive, too "know-it-all" or critical, or academically inappropriate. It is easy for someone to misinterpret the meaning when they cannot see facial expressions or hear the tone of voice.
- Avoid short, generic replies such as "I agree!", "I like it!" or "Funny!" – explain why, add another point in support of the idea, or raise a question to continue constructive dialogue.

Attendance: SCU policy defines attendance for all courses and specifies online courses as active, weekly participation in the course as described in the syllabus. Examples of activities could include, but are not limited to:

- Participating in weekly online chats or discussions
- Submitting or completing assignments
- Commenting on other student contributions
- Actively logged on and participating in class at least three times per week

See the Academic Policies page in the SCU Catalog for more details on Attendance Policy.

Accelerated Sciences Course Recommendations

- Read before and after each class. Skim the chapter before it is covered in lecture to become comfortable with some of the terms associated with each topic. Review each chapter after it is covered in class to enhance understanding of the material.
- Do not wait until the night before homework is due to start the assignment. Understanding of concepts will be enhanced if the time is taken to learn them beforehand and later review the material without being rushed.
- Stay focused by finding an environment to study with few distractions.
- Participate during class by taking notes and looking over them afterwards.
- Any topics covered in the course could be presented in subsequent examinations, so it is critical to prepare and learn all presented material.
- Remember that procrastination in an accelerated course can quickly prove disastrous! Failure to learn foundational principles can make all future material seem nearly incomprehensible, so make sure to budget time wisely over the next five weeks.

Specifically for synchronous courses:

- Ask questions for clarification when not understanding the material being covered.
- *Do not skip class, arrive late, or leave early.* Given the accelerated nature of our courses, every

minute of class missed can have a real impact on student success in a course.
- Work on assigned problems as close to the time as when the topic is covered in class to increase understanding of specific concepts.
- Find a group of students to study with. This makes studying more fun and helps learning of the material by teaching to and learning from peers. Explaining these concepts to other students aids in mastery of what is covered.

Teaching Methods & Instruction

The course will follow a linear format, meaning students will complete all of the modules in sequence. The material in each module will include a combination of readings, videos, and written and interactive assignments. Students will also complete an exam at the end of each module. Please read about each of the course components below. Each module takes approximately 8-10 hours to finish.

Note: The course requires a significant time commitment from students. In the five weeks of classes, we will cover seven chapters of the book. Not every topic will be covered in great depth, however students are expected to study each topic in detail.

Learning Objectives Check:

Each "Learning Objective Check" is an adaptive assignment on McGraw Hill's ALEKS platform; ALEKS is an artificially intelligent learning and assessment system. After determining each student's prior knowledge of a subject, ALEKS presents each student with the appropriate learning objectives that the student is ready to learn. Students will complete scaffolded calculation-based questions that introduce them to components of the learning objective. Each question is accompanied by learning resources such as media, video recordings and highlighted sections of the e-textbook. Students move through the topics by achieving at least 50-70% of each Learning Objective Check. Instructors monitor student performance on these assignments to provide targeted intervention based on each student's ability and pace.

Homework: Homework is an essential part of this course. Biostatistics is a problem-based discipline, so it is vital that you practice a lot of different problems to be successful in the course. For successful completion of the course, it is important that you work through homework assignments and complete them in a timely manner. Work out the homework problems at the same pace as the lecture and do not rush to finish the entire assignment in one sitting. All the homework assignments have deadlines. **Please mark your calendar**

Quizzes:

At the end of each Learning Objective Check, students will complete a quiz that provides on-the-spot feedback on how well students have understood and retained each chapter's content. Performance on the quiz will give students and instructors information about which concepts each student may be missing.

Online Learning at SCU

MySCU is SCU's online campus portal. It includes SCU's learning management system (Canvas). It acts as a single point of access for a variety of campus information. It houses resources such as university policies, campus safety procedures, financial aid forms, class schedules, campus news, library databases, and other electronic resources for faculty, staff, and students. Incoming students receive login credentials and learn to navigate MySCU during orientation.

Your Keys to Success

This course requires no face-to-face meetings but students are required to maintain communication with the instructor by responding within 24-48 hrs to instructor messages. To be successful in this course, students will need to log in regularly and plan ahead to manage the workload.

Self-Directed Learning

Online courses require motivation, time management, and self-discipline on the part of the learner. Creating a self-directed learning plan will help independent study skills. Creating a routine weekly study schedule and a quiet working space will help students keep pace with the accelerated nature of this course.

Exams: There are two exams in each class, a mid-term, and a final exam. There will be questions that are similar to all quizzes, homework, questions at the end of each chapter and any other activity given. The Exams are all on Canvas. Please pay attention to the due dates. They are final and will not be extended. You must use proctoring methods required by the instructor.

Note: Completing assignments open book (book, instructor office hours, tutor, Google, etc.) is different than testing in an exam environment. It is acceptable and encouraged to use all available resources to learn how to complete an assignment; however, the long-term goal should be to pass the exams without any outside aid.