



<b>Course Title</b>	<b>Introduction to Biostatistics</b>	
<b>Course Number</b>	<b>Biostatistics 100A</b>	
<b>Credit</b>	4 units	
<b>Term</b>	Spring 2016	
<b>Meeting Day/ Location</b>	MW 4pm – 5:50pm, Lakretz 110 (lecture); F 11am- 11:50am Moore 100	
<b>Instructor Information</b>	<b>Martin L. Lee, PhD, CStat, CSci,</b> Department of Biostatistics School of Public Health University of California, Los Angeles Phone: (626) 599-9260 Email: <a href="mailto:mlee@prolacta.com">mlee@prolacta.com</a> or <a href="mailto:martin.l.lee@att.net">martin.l.lee@att.net</a> (Twitter:@StatDrML) Office hours: MW 1pm – 1:30pm, 3pm – 4pm (CHS 51-239A)	
<b>Course Description</b>	Sampling situations, with special attention to those occurring in biological sciences. Topics include distributions, tests of hypotheses, estimation, types of error, significance and confidence levels, sample size.  Academic Integrity: In line with University policy, the guidelines and policy for academic integrity will be enforced. Please see the policy found at the following link for the policy provisions: <a href="http://www.deanofstudents.ucla.edu/StudentGuide.pdf">http://www.deanofstudents.ucla.edu/StudentGuide.pdf</a>  Attendance and Class Participation Policy: Class attendance is an important and necessary element of the class participation grade. Since all students are expected to <b>complete the reading and assignment before coming to class</b> , ask relevant questions, and contribute to the group discussion. Much of what we do in class is made more interesting and relevant by class interactions.	
<b>Learning Objectives/ Competencies</b>		
	<i>Learning Objectives</i>	<i>Core MPH Competencies</i>
	1. Introduction to statistics and its utility in the scientific, particularly the public health, environment.	A1. Judge, critique and interpret reports of individual epidemiologic studies; evaluate strengths and limitations of epidemiologic reports  (Also covers Competencies 1 and 10 for the EPI-MS degree)
2. Develop analytical skills involving distributions and	A4. Upon completion of this course, students will be able to distinguish among the different	

	<p>measures of central tendency and spread. Understand basic informatic techniques and how they can be applied to public health situations.</p>	<p>measurement scales and the implications for statistical descriptive methods to be used based on these distinctions.</p> <p>A5. Upon completion of this course, students will be able to apply descriptive techniques commonly used to summarize public health data.</p> <p>A8. Upon completion of this course, students will be able to apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation.</p>
	<p>3. Understand the basic concepts of probability with respect to how they apply to the fundamental interpretation of statistical data and sampling distributions.</p>	<p>A6. Upon completion of this course, students will be able to apply common statistical methods for inference.</p>
	<p>4. To develop analytical skills involving the normal distribution and other key probability distributions.</p>	<p>A6. Upon completion of this course, students will be able to apply common statistical methods for inference.</p>
	<p>5. To understand the concepts of estimation, confidence and confidence intervals and how they are used in statistical inference. To understand the difference between confidence and probability.</p>	<p>A1. Judge, critique and interpret reports of individual epidemiologic studies; evaluate strengths and limitations of epidemiologic reports</p> <p>A7. Upon completion of this course, students will be able to apply descriptive and inferential methodologies according to the type of study design for answering a particular research question.</p> <p>A10. Upon completion of this course, students will be able to develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences.</p> <p>(Also Competency 8 for CHS-MS degree,</p>

		Competencies B2, B4, B6, C2 and D1 for EHS-MS degree, and Competency 7 for EPI-MS degree)
	6. To infer single population means with point and interval estimates. To perform hypotheses tests and to interpret their results for a data set. To compare two population means with point and interval estimates. To perform hypotheses tests on the difference of two population means.	<p>A9. Upon completion of this course, students will be able to interpret results of statistical analyses found in public health studies.</p> <p>A7. Upon completion of this course, students will be able to apply descriptive and inferential methodologies according to the type of study design for answering a particular research question.</p> <p>A10. Upon completion of this course, students will be able to develop written and oral presentations based on statistical analyses for both public health professionals and educated lay audiences.</p> <p>(Also Competency 8 for CHS-MS degree, Competencies B2, B4, B6, C2 and D1 for EHS-MS degree, and Competency 7 for EPI-MS degree)</p>
	7. Introduction to techniques of statistical inference that do not require the use of standard assumptions such as the normal distribution.	A3. Upon completion of this course, students will be able to describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met.
<b>Required Texts/ Recommended Readings</b>	<p>There are two required texts for the course (the designation in parentheses refers to the reading assignments indicated below):</p> <p>Text: Samuels ML, Witmer JA, Schaffner AA. Statistics for the Life Sciences, 5<sup>th</sup> ed. Pearson, 2016 (SWS).</p> <p>Reader: Biostat 100A Course Reader (Reader)</p> <p>These are on sale in the Biomedical Bookstore in the Center for the Health Sciences (1st floor).</p>	
<b>Methods of Evaluation</b>	<p>There will be 3 separate sets of assignments:</p> <p>1) “Laboratory” assignments which involve evaluating computer output, doing some online research and examining some relevant publications for statistical content. These will focus on different ASPH Competencies. They will be distributed as appropriate. These will be due at various points during the quarter and these deadlines will be announced as relevant.</p> <p>2) Midterm examination: These will be given during the 5<sup>th</sup> and 8<sup>th</sup> weeks of classes</p>	

	(dates to be announced well in advance).  3) Final examination: This will be given out during the last lecture of the quarter and will be due one week later. The specific dates will be announced as we approach the end of the quarter.
<b>Grade Distribution</b>	Laboratory assignments must be completed in order to receive a class grade  50% 2 Midterm exams; these will be given during the 5 <sup>th</sup> and 8 <sup>th</sup> weeks of classes (dates to be announced well in advance)  50% Final exam (Tuesday, June 7, 2016 8am-11am)
<b>Course Schedule/ Readings</b>	The readings indicated below refer either to the textbook (R) or the reader. Since the lectures move at a rate relevant to the class discussions and level of material, no specific dates are indicated for each topic. (Note there is a handout that will be provided.)

<b>Topics</b>	<b>Reading</b>	<b>Homework</b>
Introduction	SWS: Ch. 1-pg.1-16	
Types of data	Reader: Ch. 2, SWS: Ch. 2-pg. 27-28	Handout, SWS: Ch.2-2.1.2
Introduction to sampling	SWS: Ch. 1-pg.16-24	SWS: Ch.1-1.3.1, 1.3.2
Data display	SWS: Ch. 2-pg.29-38, 45-52	SWS: Ch. 2-2.2.1, 2.2.7, 2.4.2
Measures of location and variability	SWS: Ch. 2-pg.40-44, 59-66 Reader: Ch. 4	SWS: Ch. 2-2.3.5, 2.3.6, 2.3.11, 2.3.13, 2.6.1, 2.6.4, 2.6.9, 2.6.15, 2.S.8, 2.S.15
Parameters and statistics	SWS: Ch.2-pg. 72-78	
Sampling distributions	SWS: Ch. 5-pg.146-157 Reader: Ch. 5	SWS: Ch. 5-5.2.15; Ch. 6-6.2.1
Probability and the normal distribution	Reader: Ch. 6 SWS: Ch. 3-pg. 83-87; Ch. 4-pg.122-134	SWS: Ch. 4-4.3.3, 4.3.4, 4.3.8, 4.3.12, 4.S.4, 4.S.6, 4.S.8, 4.S.15, 5.2.4, 5.2.6, 5.2.13

Confidence intervals	SWS: Ch. 6-pg. 176-195 Reader: Ch. 7	SWS: Ch. 6-6.3.3, 6.3.11, 6.3.15, 6.3.20, 6.4.2, 6.4.6
Hypothesis testing: 1 population	SWS: Ch. 7-pg.286-290	Handout
Hypothesis testing: 2 populations	SWS: Ch. 7-pg.228-285 SWS: Ch. 8-pg.307-324	SWS: Ch.7-7.2.1, 7.2.3, 7.2.7, 7.2.11, 7.3.4, 7.3.6, 7.5.1, 7.5.3, 7.5.9, 7.5.10, 7.S.2  Ch. 8-8.2.1, 8.2.3, 8.S.8, 8.S.12
Inferences on categorical data	SWS: Ch. 9:355-379 SWS: Ch. 10: 383-400	SWS: Ch. 9-9.2.2, 9.2.3, 9.2.5, 9.4.1, 9.4.2, 9.4.8, 9.S.3, 9.S.14, 9.S.16  Ch. 10-10.2.3, 10.2.5, 10.2.10, 10.2.13