



Course Syllabus: Probability and Statistics

STAT 220 - Lecture STAT 220

Course Information	
Comprehensive Course Description	<p>This course is an introduction to probability and statistics at the MS level for students in statistics, applied mathematics, electrical engineering and computer science. This core course is intended to provide a solid general background in probability and statistics that will form the basis of more advanced courses in statistics.</p> <p>-Course Content (tentative):</p> <p>-Probability:Probability; Random variables; Expectation; Inequalities; Convergence of random variables.</p> <p>-Statistical inference:Models, statistical inference and learning; Estimating the CDF and statistical functionals; The bootstrap; Parametric inference; Hypothesis testing and p-values; Bayesian inference; Statistical decision theory.</p> <p>-Statistical models and methods:Multivariate models; Inference about independence.</p>
Course Description from Program Guide	<p>This course is an introduction to probability and statistic for students in statistics, applied mathematics, electrical engineering and computer science. This core course is intended to provide a solid general background in probability and statistics that will form the basis of more advanced courses in statistics. Content: Probability; Random variables; Expectation; Inequalities; Convergence of random variables. Statistical inference: Models, statistical inference and learning; Estimating the CDF and statistical functionals; The bootstrap; Parametric inference; Hypothesis testing and p-values; Bayesian inference; Statistical decision theory. Statistical models and methods: Multivariate models; Inference about independence.</p>
Goals and Objectives	<p>At the end of this course, students should understand the fundamental concepts of:</p> <ol style="list-style-type: none"> (1) Probability; (2) Statistical inference; (3) Statistical models and methods; <p>and apply them for basic data analysis.</p>
Required Knowledge	Advanced and multivariable calculus, linear algebra.
Reference Texts	<p>Textbook: Wasserman, L. (2004), All of Statistics: A Concise Course in Statistical Inference, Springer.</p> <p>Reference Books:</p> <p>Ross, S. (2002), First Course in Probability, Sixth Edition, Prentice-Hall.</p> <p>Hogg, R., and Tanis, E. (2009), Probability and Statistical Inference, Eighth, Edition, Prentice Hall.</p> <p>Casella, G., and Berger, R. (2002), Statistical Inference, Second Edition, Duxbury.</p> <p>Ugarte, M. D., Militino, A., and Arnholt, A. T. (2016), Probability and Statistics with R, 2nd edition, CRC Press.</p>
Method of evaluation	<p>40.00% - Final exam 20.00% - Homework /Assignments 20.00% - Exam 2 20.00% - Exam 1</p>
Nature of the assignments	<p>•Homeworks: Homework sets will be assigned on Wednesday and will be due in class on the following Wednesday. Some homework assignments may require the use of the free statistics software R for calculations and/or plots. Late homeworks will not be accepted (except in university established cases of illness or emergency). Solutions of homeworks will be provided.</p> <p>Collaboration and checking answers on homeworks is allowed and encouraged. Of course copying homeworks is not tolerated. In brief you are allowed to collaborate on all homework problems according to the following rules: You must first attempt to solve each problem on your own. If you get stuck you can then talk to any student currently enrolled in the class about the problem, as well as the instructor or TA. However, solutions should not be exchanged (i.e., you still must work through the details of the problem after you have gotten help, write the final solutions alone, and understand them fully).</p> <p>•Exams: Two midterm-exams are scheduled in class during the semester. The final exam is scheduled during the final week. The exams are closed books and closed notes. However, you are allowed to bring one sheet of notes, formulas, or any other information you would like to put on the page (no photocopy and no homework solutions are allowed). This note sheet should be limited to one sheet (front and back) of paper (8.5 x 11 inches: A4 format) for the first exam. However, you can bring 2 such sheets for the second exam and 3 for the final exam.</p>

Note

The instructor reserves the right to make changes to this syllabus as necessary.