BST 411 - STATISTICAL INFERENCE - FALL 2017

INSTRUCTOR: Anthony Almudevar, Ph.D.
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LECTURES: MW 1:45-3:15pm -- SRB 1.402

OFFICE HOURS: By appointment.

PREREQUISITES: For Ph.D. students in statistics, mathematics at the level of advanced calculus or introductory real analysis, mathematical statistics at the level of STT 203, and probability at the level of BST 401 (co-requisite). For MS students in statistics and those from other departments, two years of college mathematics, and probability and mathematical statistics at the level of STT 201 and STT 203. Otherwise, permission of the instructor.

PRIMARY TEXTS:

1. Bickel, P.J. and Doksum, K.A. (1991). Mathematical Statistics, Volume 1 (Second Edition) CRC Press.

OTHER USEFUL REFERENCES:

2. Casella, G. and Berger, R. L. (2002). Statistical Inference, Second Edition. Pacific Grove: Duxbury.

3. Cox, D. R. and Hinkley, D. V. (1979). Theoretical Statistics. London: Chapman and Hall.

4. Lehmann, E. L. (1997). Testing Statistical Hypotheses, 2nd Edition. Springer-Verlag

5. Lehmann, E. L. (1998). Theory of Point Estimation, 2nd Edition. Springer-Verlag

6. Serfling, R. J. (1980). Approximation Theorems of Mathematical Statistics. New York: Wiley.

Note that the Bickel & Doksum text is published in two volumes. Although BST 411 uses only the first volume, students should consider obtaining both, since they can often be bought together at a considerable discount. The second volume contains material students are likely to find useful in later courses.

COURSE CONTENT: The course will provide an introduction to the advanced theory of statistical inference. Topics will include: Bayesian models and decision theoretic models; Bayes and minimax procedures; Sufficiency; Exponential family models; Estimating equations; Maximum likelihood estimation; Unbiased estimation; Information inequality; Group models and invariance; the Neyman-Pearson Lemma and UMP testing; Likelihood ratio procedures; Introductory topics in asymptotic inference. The course will provide a theoretical introduction to statistical modelling, including Gaussian linear models and generalized linear models.

GRADING: There will be homework assignments (approximately every 2 weeks), a midterm examination, and a final examination, constituting 40%, 25%, and 35% of the course grade, respectively.