

Instructor: Malay Ghosh

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Course Outline: The objective of STA 7347 is to introduce students to some special topics in statistical inference, primarily frequentist. We will begin with the classical Neyman-Pearson theory of hypothesis testing followed by confidence estimation and its relationship to hypothesis testing. Then I will move to some foundational issues of statistical inference such as likelihood principle, ancillarity and so on. We will then discuss some new likelihoods, such as the profile likelihood, modified profile likelihood and adjusted profile likelihood. Finally, as time permits, we will do some asymptotic theory of inference including Edgeworth expansion and saddlepoint approximation.

Course Policy: A student's grade will be determined from the quizzes(20%), a midterm (35%), and a final examination (45%).

Course Outline:

1. Hypothesis Testing
2. Confidence Estimation
3. Likelihood Principle and Ancillarity
4. Likelihood-Based Inference
5. Edgeworth Expansion
6. Saddlepoint Approximation

Course Material: Lecture Notes of the Instructor

Principal References:

1. T.S. Ferguson: Mathematical Statistics : A Decision Theoretic Approach.
2. E.L. Lehmann and J. Romano: Testing Statistical Hypotheses, 3rd Edition.

Other References

1. J.O. Berger and R. Wolpert: The Likelihood Principle. IMS Lecture Notes Monograph Series.
2. D.R. Cox and D.V. Hinkley: Theoretical Statistics. Chapman and Hall, London.
3. J.K. Ghosh: Statistical Information and Likelihood: a Collection of Critical Essays by Dr. D. Basu.
4. J.K. Ghosh: Higher Order Asymptotics. NSF-CBMS Conference Series, Volume 4.
5. J.C. Kiefer: Introduction to Statistical Inference. Springer Verlag, New York.
6. T. Severini: Likelihood methods in Statistics. Oxford University Press, Oxford, England.
7. M.J. Schervish: Theory of Statistics. Springer Verlag, New York.
8. J. Shao: Mathematical Statistics. Springer Verlag, New York.