Mathematical statistics (2nd module) – Francesco Bartolucci

Syllabus

- Sampling: population and random sample; data reduction and sufficiency; sample statistics; sampling distribution.
- Point estimation: estimator and estimate; elements of maximum likelihood estimation and method of moments; finite-sample properties of an estimator; asymptotic properties.
- Interval estimation: confidence interval; pivot method; asymptotic and likelihood based confidence intervals.
- Hypothesis testing: statistical hypothesis and testing; error probabilities and power function; likelihood ratio method.
- Elements of Bayesian inference: prior and posterior distributions; inference based on the posterior distribution; elements of Bayesian computation

Exam
Written based on exercises and open questions

Books
Casella, G. and Berger, R. L. (2002). *Statistical inference, 2nd edition*. Pacific Grove, CA: Duxbury.
Evans, M. J., and Rosenthal, J. S. (2010). *Probability and statistics: The science of uncertainty*. Macmillan, NY.