

Statistics

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Certification in Statistics as part of the requirement for the PhD in Mathematics includes the following:

1. Familiarity with undergraduate level probability and statistics. Representative undergraduate texts include Hogg and Craig, Lindgren, Mood Graybill and Bose, Fisz, Cox and Hinckley, and Neter and Wasserman.
2. Understanding of the theoretical basis of the core of statistics, as represented in Wilks in the following sections:
 - (a) Characteristic and generating functions. Sections 5.1, 5.3, and 5.4.
 - (b) Multivariate normal. Section 7.3 and 7.4.
 - (c) Sampling theory. Sections 8.4 and 8.7.
 - (d) Asymptotic theory. Sections 9.3 and 9.4.
 - (e) Linear estimation. Sections 10.1, 10.2, 10.3, and 10.4.
 - (f) Estimation. Sections 12.1, 12.2, 12.3, 12.4, and 12.5.
 - (g) Testing. Sections 13.1, 13.2, 13.3, 13.4, 13.7, and 13.8.
3. Some knowledge of two of the following additional areas of statistics. The principal reference is again Wilks. Other texts are also listed. The order in which texts are listed is not meant to suggest preference; the student should decide that after examining the texts and possibly discussing her or his plan with an advisor.
4. Decision Theory. Wilks (Chapter 16), Ferguson, Wald 1950.
5. Nonparametric and distribution free statistics. Wilks (Chapters 11 and 14), Rohatgi (Chapter 8), Wasan, Hollander, and Wolfe.
6. Multivariate statistics. Wilks (Chapter 18), Anderson, Rao.
7. Sequential analysis. Wilks (Chapter 15), Rohatgi (Chapter 14), Wald 1947.
8. Linear statistical models—regression, analysis of variance, design of experiments. Wilks (Chapter 10), Graybill, Rao.

Bibliography

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4. Ferguson, T. E., *Mathematical Statistics: A Decision Theoretic Approach*, Academic Press, 1967.
5. Fisz, M., *Probability Theory and Mathematical Statistics*, Wiley, 1963.
6. Fraser, D. A. S., *Nonparametric Methods in Statistics*, Wiley,
7. Graybill, F. A., *Theory and Application of the Linear Model*, North Scituate, MA, Duxbury Press, 1976.
8. Hogg, R. V., and Craig, A. T., *Introduction to Mathematical Statistics*, Third Edition, Macmillan, 1970.
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11. Lehman, E. L., *Testing Statistical Hypotheses*, Wiley, 1959.
12. Mood, A. M., Graybill, F. A., and Boes, D. C., *Introduction to the Theory of Statistics*, Third Edition, McGraw-Hill, 1974.
13. Nemenyi, *et.al.*, *Statistics from Scratch*, Holden-Day, 1977.
14. Neter, J., and Wasserman, W., *Applied Linear Statistical Methods*, Irwin, 1974.
15. Rao, C. R., *Linear Statistical Inference and Its Applications*, Wiley, 1965.
16. Rohatgi, V. K., *An Introduction to Probability Theory and Mathematical Statistics*, Wiley, 1976.
17. Scheffe, H., *The Analysis of Variance*, Wiley, 1959.
18. Wald, A. (1947), *Sequential Analysis*, Wiley, 1947.
19. Wald, A. (1950), *Statistical Decision Functions*, Wiley, 1950.
20. Wasan, M. T., *Parametric Estimation*, McGraw-Hill, 1970.
21. Wilks, S. S., *Mathematical Statistics*, Wiley, 1962.