

# QUEEN MARY, UNIVERSITY OF LONDON

**MAS 314**

**Design of Experiments**

**Reading List**

**Spring 2007**

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- [1] G. E. P. BOX, W. G. HUNTER & J. S. HUNTER: *Statistics for Experimenters*, Wiley, New York, 1978.
  - [2] G. M. CLARKE & R. E. KEMPSON: *Introduction to the Design and Analysis of Experiments*, Arnold, London, 1997.
  - [3] G. W. COBB: *Design and Analysis of Experiments*, Springer-Verlag, New York, 1998.
  - [4] W. G. COCHRAN & G. M. COX: *Experimental Designs*, Wiley, New York, 1957.
  - [5] D. R. COX: *The Planning of Experiments*, Wiley, New York, 1958.
  - [6] A. DEAN & D. VOSS: *Design and Analysis of Experiments*, Springer, New York, 1999.
  - [7] K. HINKELMANN & O. KEMPTHORNE: *Design and Analysis of Experiments*, Volume 1, *Introduction to Experimental Design*, Wiley, New York, 1994.
  - [8] J. A. JOHN & M. QUENOUILLE: *Experiments: Design and Analysis*, Griffin, London, 1977.
  - [9] P. W. M. JOHN: *Statistical Design and Analysis of Experiments*, MacMillan, New York, 1971.
  - [10] O. KEMPTHORNE: *The Design and Analysis of Experiments*, Wiley, New York, 1952.
  - [11] D. V. LINDLEY & W. F. SCOTT: *New Cambridge Statistical Tables*, Second Edition, Cambridge University Press, Cambridge, 1995.
  - [12] J. N. S. MATTHEWS: *An Introduction to Randomized Controlled Clinical Trials*, Arnold, London, 2000.
  - [13] R. MEAD: *The Design of Experiments*, Cambridge University Press, Cambridge, 1988.
  - [14] D. C. MONTGOMERY: *Design and Analysis of Experiments*, fourth edition, Wiley, New York, 1997.
  - [15] S. C. PEARCE: *The Agricultural Field Experiment*, Wiley, Chichester, 1983.
  - [16] S. J. POCKOCK: *Clinical Trials: A Practical Approach*, Wiley, Chichester, 1983.
  - [17] G. K. ROBINSON: *Practical Strategies for Experimenting*, Wiley, New York, 2000.

- [18] H. SCHEFFÉ: *The Analysis of Variance*, Wiley, New York, 1959.
- [19] A. PENFOLD STREET & D. J. STREET: *Combinatorics of Experimental Design*, Oxford University Press, Oxford, 1987.
- [20] E. R. WILLIAMS & A. C. MATHESON: *Experimental Design and Analysis for Use in Tree Improvement*, CSIRO, Melbourne, 1994.

## Notes

**Principles of design:** I have found nothing to equal [3] or [5] for a clear introduction to the important considerations in designing experiments. The books [2] and [13] are in a similar vein. There are many text-books at a slightly higher mathematical level: choose from [6], [8], [9], [10] and [14]. [7] is an update of [10].

**Practical advice:** The practical aspects of designing experiments in the agricultural, forestry, medical and industrial contexts are well explained by [15], [20], [12] and [16], [1] respectively. [20] contains an excellent chapter on recording data. [17] is excellent on the interface between the statistician and the scientist.

**Combinatorial design:** The classic book of designs is [4], which tabulates many designs and comments on their properties but gives no information on how to construct new designs yourself. The best book on constructions is [19], but it does assume familiarity with finite groups and finite fields.

**Tables:** Every working statistician needs a good book of statistical tables. Design of experiments needs tables of random numbers (a substitute for shuffling cards); analysis of experiments needs  $F$  tables and  $t$  tables. College provides [11] in examinations, so it is a good idea to become familiar with it.

**Analysis of variance:** There is a wealth of books on this technique, which is essential to, but not peculiar to, the analysis of designed experiments. Most of these books are more confusing than helpful, but I find parts of [18] quite useful.

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