Applied Statistics Qualifying Exam Reading List

The qualifying exam on applied statistics is an open book exam --- you can use whatever books and notes you bring with you. The exam is based on the books *Statistical Concepts and Methods*, by G. K. Bhattacharyya and R. A. Johnson, *Beyond ANOVA: Basics of Applied Statistics* by Rupert G. Miller, Jr. and *Generalized Linear Models: with Applications in Engineering and the Sciences 2nd Edition*, by Raymond H. Myers et al. It not required that you bring these books to the exam with you, the exam might refer to specific pages in the books in order to clarify terminology. (In some places the use of terminology in Bhattacharyya and Johnson is perhaps a bit nonstandard. The exam uses the terminology from Bhattacharyya and Johnson, but also clarifies nonstandard terminology.)

You can use a calculator (but not a computer), and *it is recommended that you bring a calculator with you* (although it is not assumed that you will have a calculator that has special statistical capabilities).

The exam may require tables associated with the standard normal distribution, various chi-square, *t*, and *F* distributions, and also tables of the exact distributions for the sign test, the signed-rank test, and the rank sum test. *These tables will not be supplied with the exam --- you are expected to bring appropriate tables with you* to the open-book qualifying exam. (The tables in the appendix of *Statistical Concepts and Methods* by G. K. Bhattacharyya and R. A. Johnson will be sufficient, but tables from other books can also be used.)

The exam may contain model output and model diagnostics that provide the basis for asking question about interpretation and alternatives if model assumptions are not met. The tabular and graphical output may be from either SAS or R.

The exam covers material in the following parts of the book *Statistical Concepts and Methods*, by G. K. Bhattacharyya and R. A. Johnson:

- Chapter 6,
- Sec. 7.4 through Sec. 7.7,
- Chapter 8,
- Chapter 9,
- Chapter 10,
- Sec. 11.1 through Sec. 11.3,
- Chapter 12,
- Chapter 13,
- Sec. 14.1 through Sec. 14.5,
- Chapter 15.

The exam a covers material in the following parts of the book *Beyond ANOVA: Basics of Applied Statistics*, by Rupert G. Miller, Jr.:

- Chapter 1 - One Sample (omitting Sec. 1.3 Dependence),
- Chapter 2 - Two Samples(omitting Sec. 2.4 Dependence),
- Chapter 3 - One-way Classification (omitting Sec. 3.4 and Sec. 3.8 Dependence),
- Chapter 4 – Two-Way Classification (omitting Sec. 4.4 Dependence),
- Chapter 7 – Variance (omitting Sec. 7.3 Dependence).

While *Beyond ANOVA* is packed with information, the exam will focus on the main points of the book (as well as the material in *Statistical Concepts and Methods*), and not the minutia. You should become familiar with the uses, the strengths and weaknesses, and the robustness of the inference methods presented (noting that for each setting, a "normal theory" procedure is typically presented, as well as some nonparametric and robust alternatives).

The exam covers material in the following parts of Generalized Linear Models: with Applications in Engineering and the Sciences, 2nd Edition, by Raymond H. Myers et al.

- Chapter 3 - Nonlinear Regression Models (omitting Sec. 3.3.5, 3.3.6 and Sec. 3.7),
- Chapter 4 – Logistic and Poisson Regression Models (omitting Sec. 4.2.7 and Sec. 4.4)