Syllabus for PhD Qualifying Exam in Probability Theory

The exam will be based on the following topics.

1. Distribution function in one and several dimensions. Characteristic functions. Various examples of these.

2. Random variables, various modes of convergence, expectation, variance, conditioning.

3. Independence, weak and strong laws, the central limit theorem, Law of the iterated logarithm, convergence of series.

4. Random Walks, recurrence, transcience.

5. Martingales, convergence theorems, inequalities.

6. Markov Chains.

7. Elementary Brownian Motion.

Two references which together cover all the above (and more) are.

1. K. L. Chung A Course in Probability Theory. Academic Press 1974.

2. S. Karlin and H. M. Taylor. A First Course in Stochastic Processes. Academic Press 1975.