Random processes with statistical application

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For: first year postgraduate
Prerequisites: basic course of Functional analysis, course of Theory Probability and Mathematical Statistics.
Short description:
This course is an introduction to theory of Gaussian random processes and to statistics of Gaussian processes. We discuss problems of evaluation of some functional of these processes, simulation and application Gaussian processes for method of Monte- Carlo.
Sillabus:

1. Gaussian random vectors.
2. Gaussian random processes.
3. Stationary random processes.
4. Theorem of Kharunen.
5. Analytic properties of Gaussian processes.
6. Evaluation of mean of Gaussian processes.
7. Evaluation of correlation function of Gaussian processes.
8. Application to Monte-Carlo method

Required text:

1. V.V. Buldygin, Yu.V.Kozachenko (2000) Metric Characterization of Random Variables and Random Processes, American Mathematical Society, Providence, Rhode Island
2. Yu.V. Kozachenko, O.Pogorilyak, I.Rozora, A.Tegza (2016) Simulation of Stochastic Processes with given Accuracy and Reliability, ISTE Press Ltd, London and Elsevier Ltd Oxford

Recommended text:

1. I.I.Gikhman and A.V.Skorochod (1974) Theory of Random Processes, vol.1, Springer-Verlag Berlin-Heidelberg-New York