



**MA 367 Jan 3:0**

## **Topics in Gaussian processes**

### **Instructor**

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**Department: Mathematics**

Course Time:

Lecture venue:

Detailed Course Page:

## **Announcements**

### **Brief description of the course**

Introduction to the world of Gaussian processes. Graduate students working in probability and also those in certain aspects of signal processing might benefit from the course.

### **Prerequisites**

A course in measure theoretic probability. Basic language of measure theory and functional analysis.

### **Syllabus**

A course in Gaussian processes. At first we shall study basic facts about Gaussian processes - isoperimetric inequality and concentration, comparison inequalities, boundedness and continuity of Gaussian processes, Gaussian series of functions, etc. Later we specialize to smooth Gaussian processes and their nodal sets, in particular expected length and number of nodal sets, persistence probability and other such results from recent papers of many authors.

### **Course outcomes**

Fundamental concepts of Gaussian processes. Also about stationary Gaussian processes on the line which are useful in signal processing and filtering theory.

### **Grading policy**

50% for assignments, 50% for final (could be a presentation or an exam)

## **Assignments**

## **Resources**

- 1) Svante Janson, *Gaussian Hilbert Spaces*, Cambridge University Press, Cambridge, 1997.
- 2) A. I. Bogachev, *Gaussian Measures*, American Mathematical Society, Providence, RI, 1998.
- 3) Michel Ledoux and Michel Talagrand, *Probability in Banach spaces. Isoperimetry and processes*, Springer-Verlag, Berlin, 2011.