Actividades Formativas IMEIO/ Educational Activities IMEIO

Título/Title: Introduction to Malliavin Calculus and Applications
Organizador/Organizer: Carlos Escudero Liébana [cel@icmat.es]
Profesores/Lecturers: Carlos Escudero Liébana [cel@icmat.es]
Horas totales/Number of hours: 10
Lugar/Location: Online
Fechas/Dates: 01/2020

Resumen/Summary: This course will give a short introduction to the Malliavin calculus or stochastic calculus of variations. It is well known as powerful framework that allows for the construction of a pure probabilistic proof of the Hörmander theorem and for an extension of the Itô theory of stochastic integration. We will give a relatively accessible introduction to the subject and to one of its financial applications, the computation of hedging portfolios by means of pure probabilistic tools. General prerequisites for the course: the Itô theory of stochastic integration. Specific prerequisites for the financial part: the Black-Scholes theory of option pricing.

Program:

-1. Double Wiener-Itô Integrals

-2. Chaos Expansions

-3. Multiple Wiener-Itô Integrals

-4. The Wiener-Itô Theorem

-5. Malliavin Derivatives

-6. The Itô and Martingale Representation Theorems

-7. The Clark–Ocone Formula

-8. Computation of Hedging Portfolios

¿Aceptarías que el curso se pudiera emitir por videoconferencia restringido a algunos alumnos del doctorado que no pudieran asistir presencialmente? Would you accept that the course could be given by videoconference restricted to some doctoral students who could not attend in person? Yes