

SEMINARIO ALEATORIO 448

STOCHASTIC CONTROL FOR DISCONTINUOUS SEMIMARTINGALES AND BDG-TYPE INEQUALITIES

RESUMEN:

Stochastic control problems with discontinuous dynamics are often modelled via Itô jump-diffusions, where the discontinuous martingale components are given by stochastic integrals with respect to a compensated *Poisson random measure*. In more general control formulations, the (predictable) jump compensator may have a non-Poisson structure and may include *predictable atoms*, in which case the natural model inputs are the predictable *semimartingale characteristics*.

While classical Burkholder-Davis-Gundy (BDG) inequalities remain valid, they provide bounds in terms of quadratic variation, and expressing these bounds in terms of predictable characteristics becomes nontrivial in the presence of predictable jump times due to “*innovation terms*” at the atoms of the compensator.

In this seminar, we consider stochastic control problems formulated in a general semimartingale framework, together with refined BDG-type inequalities that yield moment estimates directly in terms of predictable characteristics and jump functionals. These estimates provide the tools to analyse the integrability and stability properties required for verification arguments, dynamic programming principles, and the treatment of value functions with polynomial growth. Beyond the control setting, the same inequalities are relevant for the analysis of jump-driven models arising in stochastic analysis and for the stability of inference and simulation schemes involving general compensated random measures.

Presentado por



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Detalles del evento:

-  **Fecha:** Viernes 20 de febrero, 2026
-  **Hora:** 13:00 (Hora Centro de México)
-  **Ubicación:** salón SA-2
ITAM Campus Río Hondo