Risk Measures ORIE6630
Fall 2014, 2 credits

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Lectures: 3 h/week starting after Fall break. The last week of classes will have an additional 3h dedicated to student presentations.

Office hours:
Andreea Minca: Monday 11 a.m. - 12 p.m in RHD 222. Email: acm299@cornell.edu or by appointment.

Contents:

This is an introductory course on the theory of risk measures. In the first part of the course we will introduce the axiom sets for monetary, convex and coherent risk measures. We will then characterize risk measures in terms of their acceptance sets and discuss the financial applications to regulatory capital. In the second part of the course we will discuss the relation between coherent risk measures and convex game theory. The last part of the course will be dedicated to systemic risk measures and the problem of risk allocation.

- Axiom sets for monetary, convex and coherent risk measures; Acceptance sets.
- Representation theorems for convex and coherent risk measures.
- Systemic risk measures and risk allocation.

Prerequisites: Real analysis at level of MATH 4130; Probability at the level of the first part of the course ORIE 6500;

Literature: We will use

- Hans Foellmer and Alex Schied. Stochastic Finance: An Introduction in Discrete Time (Third revised and extended edition) 2011 (Chapter 4).
- Artzner, Ph., F. Delbaen, J.-M. Eber, and D. Heath. Coherent Measures of Risk, Mathematical Finance, 1999.

Other literature (non-exhausive and may change in response to the audience's interests)

- Chen, C., Iyengar, G., Moallemi, C. An axiomatic approach to systemic risk, Management Science, 2013.
- Braverman, A., and Minca, A. Networks of Common Asset Holdings: Aggregation and Measures of Vulnerability , 2014
- Amini, H., D. Filipović, and Minca, A. Systemic risk with central counterparty clearing, 2013
- Brunnermeier, Markus K. and Cheridito, Patrick, Measuring and Allocating Systemic Risk, 2013

Grading: The final grade will be based on class participation and a final article presentation or team project.

Academic Conduct: Each student in this course is expected to abide by the Cornell University Code of Academic Integrity.