

## Programmation stochastique

**ECTS** : 3

**Volume horaire** : 15

### **Description du contenu de l'enseignement :**

Uncertainties are ubiquitous in modeling real-world problems. Including uncertainty in an optimization model is now standard practice in industry,

thanks to the development of both mathematical models and efficient software.

In this course, we will discuss several classes of optimization problems that account for uncertainty in the problem data. The concepts of multistage problems, probabilistic constraints and risk measures will be used to derive the problem formulations of interest. We will also review algorithms that can be used to tackle stochastic programming problems, from both a theoretical and a practical perspective using recently developed packages.

### **Compétence à acquérir :**

- Identify the main stochastic programming models
- Understand the scenario formulation in stochastic programming.
- Formulate a problem as a multistage stochastic program.

### **Mode de contrôle des connaissances :**

Written exam

### **Bibliographie, lectures recommandées :**

J. R. Birge and F. Louveaux, *Introduction to Stochastic Programming 2nd Edition*, 2011.

G. Cornuéjols, J. Pena and R. Tutuncu, *Optimization in Finance 2nd Edition*, 2018.

A. Shapiro, D. Dentcheva and A. Ruszczyński, *Lectures on Stochastic Programming 3rd edition*, 2021.