Course program*: Financial Risk Modeling for Pharmaceuticals
EpiX Analytics, Boulder, CO

Participants are encouraged to prepare for the class by reviewing this document. However, this is not a pre-requisite for attendance.

The course runs from 09:00 to 17:00 each day, but registrations on the first day begin at 8:30am. Morning and afternoon coffee and lunch are provided. A social event will be provided at the beginning of the course. The course will be delivered in English.

Day 1	Risk modeling basics and applications
	Welcome and general Introduction
	Introduction to risk analysis in the pharmaceutical industry
	    o The use of qualitative and quantitative approaches
	    o Applications and real-file examples of financial risk analysis in the pharmaceutical industry
	Why and how to do risk analysis
	    o Fundamentals of Monte Carlo simulation and probability theory
	    o Example/exercise: Evaluating the financial risks around a Phase II drug
	Getting started with @RISK/Crystal Ball/Monte Carlos software
	    o Monte Carlo simulation, Excel-add-ons (@RISK® and Crystal Ball)
	    o Example/exercise: Modeling medical risks (e.g. FDA approval)
	Probability and distribution basics:
	    o Mean, mode, standard deviation, percentiles, etc.
	    o Calculation vs. Monte Carlo simulation
	    o eNPV, single-point estimates and stochastic NPV
	    o Relative vs. cumulative, discreet vs. continuous distribution
	    o Graphical representations of risk events
	Example/exercise: Understanding the financial risks around a business development (BD) deal

Day 2	Risk modeling and decision making
	Important techniques for modeling risk in pharma
	    o Most appropriate distributions to use
	    o The importance of correlations and dependencies
	    o Example/exercise: Impact of competitor risk on sales forecasts
	The use of expert opinion and historical data:

	o Expert opinion distributions o Expert opinion eliciting o Best practices, types of biases, and how to prevent them o The use of P10's and P90's o The use of historical data in risk analysis o Example/exercise: Sales forecast and budget forecasting model o Extra example/exercise: The value of information of a clinical trial Portfolio decision making: o The use of stochastic optimization in R&D portfolio decision making o Example/exercise: Selecting an optional R&D portfolio, given a finite budget and workforce Interpreting and presenting results: o Typical risk analysis results, their presentation and correct interpretation o The use of NPV's and IRRT's in stochastic modeling o Good modeling practices and common mistakes o Comparing options using risk analysis o Critiquing a risk analysis o Examples/exercise: Interpreting and presenting around a business development (BD) deal Discussion of participants' modeling problems Delivery of certificates of attendance and adjourn

*The program might be slightly modified based on relevance to audience.