PROCESS DESIGN AND PLANNING UNDER UNCERTAINTY

In the last decade, design under uncertainty and more recently, planning operations under uncertain conditions started to become mainstream engineering practice. The reason relies on the fact that the increased competitiveness of industry forces better planning. The advances in computational speed and methods, as well as the introduction of commercial software, allows these techniques to be now implemented in practice.

This is short course is intended to introduce the techniques needed for a successful design under uncertainty. The course uses a series of examples to illustrate the techniques and the results.

The instructor is a Professor at the Chemical Engineering Department of the University of Oklahoma. He holds a Ph.D. from the California Institute of Technology, has been a Professor in Argentina and has performed research and teaching at UCLA, USA. His industrial experience includes a six-year project to build a heavy water plant in Argentina, several consulting work and a three years position at Simulation Sciences (SIMSCI). He has several publications in the area of risk management.

Course Duration: One or Two days

1. CAPACITY INVESTMENT PLANNING (PROJECTS IN GENERAL)
   What process to build, when to build, what capacity to build, etc.

2. PLANNING OF CLEANING IN HEAT EXCHANGER NETWORKS.
   Which exchanger to clean and when. Constrained by number of cleaning teams, resources, etc.

3. SUPPLY CHAIN DESIGN AND/OR OPERATIONS.
   Product transport and distribution. Location and capacity of warehouses and distribution centers, etc.

4. SCHEDULING OF PETROLEUM DRILLING AND PRODUCTION MANAGEMENT.
   What wells to drill, when to drill, how to produce them and how to assign rigs to wells.

5. SCHEDULING OF BATCH PLANTS.
   With integrations with budgeting, consumer satisfaction measures, etc.

6. REFINERY OPERATIONS SCHEDULING AND PRODUCTION PLANNING.
   Applications to production planning, crude and product blending operations, etc. Like PIMS, but nonlinear.

The course may include hands on or demonstration exercises using excel, and other commercial software (@Risk and Crystal Ball). This course emphasizes design and barely touches on financial risk. Financial risk emphasis is offered in other course.