

Spreadsheet Problem-Solving for Chemical Engineers

This two-day course provides a comprehensive hands-on experience in solving numerical problems often encountered by chemical engineers using Microsoft Excel. Scenarios include material and energy balances, fluid flow, heat transfer, separations, chemical reactions, and process flowsheets. Methods included are equation-solving, data analysis, optimization and process economics.

Day One

Basic Spreadsheet Skills

- Configuring Excel for engineering calculations
- Efficient spreadsheet manipulations
- Formulas, cell addressing and range names
- Creating engineering graphs

Process Calculations

- Dealing with engineering formulas and units
- Debugging spreadsheet calculations
- Flowsheet calculations with recycle
- Targeting calculations
- Case studies

Day Two

Dealing the Data

- Table look-up and interpolation
 - Incorporation table look-up in engineering calculations
 - Continuous tables
- Quadrature and smoothing
- Excel's Data Analysis Toolpak
- Histograms and distributions
- Model building through curve-fitting

Numerical Problem-Solving

- Solving algebraic equations
 - Single nonlinear equations
 - Sets of linear equations
 - Sets of nonlinear equations
 - Numerical solution of differential equations
- Optimization calculations
- Capstone design calculations
- Economic evaluation
- Cash flow and profitability