Spreadsheet Problem-Solving for Chemical Engineers (CH764VTL)

Virtual Course

Day 1

10:00 – 11:30 Session 1

Basic Spreadsheet Skills

- Configuring Excel for engineering calculations
- Efficient spreadsheet manipulations

12:00 – 1:30 Session 2

Basic Spreadsheet Skills

- Formulas, cell addressing, and range names
- Creating engineering graphs

2:30 – 4:00 Session 3

Process Calculations

- Dealing with engineering formulas and units
- Debugging spreadsheet calculations
- Flowsheet calculations including recycle streams

4:30 – 6:00 Session 4

Process Calculations

- Targeting calculations
- Case studies

Day 2

10:00 – 11:30 Session 1

Dealing with Data

- Table look-up and interpolation
    - Incorporating discrete table-lookup in engineering calculations
    - Continuous tables with linear interpolation

12:00 – 1:30 Session 2

Dealing with Data

- Quadrature and smoothing
- Excel's Data Analysis Toolpak
- Histograms and distributions
- Model building through curve-fitting

2:30 – 4:00 Session 3

Numerical Problem-Solving

- Solving algebraic equations and systems
    - Single nonlinear equations
    - Sets of linear equations

    - Sets of nonlinear equations
- Numerical solution of differential equations

4:30 – 6:00 Session 4
Numerical Problem-Solving
- Optimization calculations
- Capstone design calculations
- Process economic evaluation
    - Cash flow and profitability

Excel VBA Programming for Chemical Engineers (CH766VTL)
Virtual Course

Day 3
10:00 – 11:30 Session 1
Getting Started with VBA
- Configuring Excel for VBA programming
- The Visual Basic Editor environment
- Recording and editing macros
- Debugging in the Visual Basic Editor

12:00 – 1:30 Session 2
User-Defined Functions
- Programming user-defined functions (UDFs)
- Including programming structure in UDFs
- Borrowing Excel spreadsheet-based functions
- Developing array functions
- Packaging collections of functions in an Excel add-in

2:30 – 4:00 Session 3
Delving into VBA Programming
- Communicating with the spreadsheet
    - Object-oriented concepts
- Data types and scope
- VBA programming structures
- Modular organization of VBA programs

4:30 – 6:00 Session 4
User Interfaces and VBA Applications
- Message boxes, input boxes and on-sheet buttons
- Programming event handlers
- Designing and creating userforms
- Integrating course concepts into an Excel VBA application
- Interfacing with external programs