



## Microsoft Excel for Engineers and Scientists

**Overview:** This course is designed for students in the scientific and engineering professions who wish to build upon their data analysis, number crunching, and charting capabilities. Students will learn how to use Excel's math, trig, statistical and scientific functions; build powerful formulas using arrays; use Solver and Goal Seek; and explore Distributions, the Analysis ToolPak, and advanced charting techniques.

**Prerequisites:** Microsoft Excel 2003, Introductory to Advanced knowledge.

**Course Length:** Two Days

### Course Content

#### **Lesson 1: Employing Range Names**

- Guidelines For Range Names
- Using The Name Box
- Creating Names From Labels
- Changing and Deleting Range Names
- Defining Spreadsheet Constants
- Setting up Dynamic Range Names

#### **Lesson 2: Math and Trig Functions**

- Permutation and Combinations
- Factorial Functions
- Random Number Generation
- Rounding Functions
- Trigonometric Functions
- Other Math Functions

#### **Lesson 3: Statistical Functions**

- Average, Mode, and Median
- Standard Deviation and Variance
- Curve Fitting and Regression Analysis
- Determining Confidence Intervals
- Chi Square and Correlation Tests

#### **Lesson 4: Scientific Functions**

- Converting Units Automatically
- Functions For Ranking Data
- Other Useful Functions

#### **Lesson 5: Building Powerful Formulas Using Arrays**

- Improved Rounding
- Conditional Counting
- Cleaning Up a Data Download Using Arrays
- When Not to Use Arrays

#### **Lesson 6: Using Solver and Goal Seek**

- Using Goal Seek to Determine Variables

Using Solver to Find Specific Cell Values

**Lesson 7: Useful Non-Scientific Functions**

IF and Choose  
VLOOKUP  
Match and Offset  
Address and Indirect

**Lesson 8: Working with Distributions**

Normal Distributions  
Frequency  
Histograms and Pareto

**Lesson 9: The Analysis ToolPak**

How to Install the Analysis ToolPak  
Descriptive Statistics  
Correlation  
Covariance  
Ranks and Percentile

**Lesson 10: Advanced Charting**

Creating Scatter Charts  
Displaying Trend Lines  
Adding Error Bars  
Creating Dual Axis Charts  
Creating Charting Templates  
Creating a Populations Histogram

**Lesson 11: Miscellaneous Topics**

Manipulating Sheets  
Using Symbols in Excel  
Using Paste Special Commands  
Creating Custom Formats  
Using the Go To Special Commands  
Setting Preferences in Tools Options

**Lesson 12: Database Analysis Techniques**

Importing and Cleaning Up Text Files  
Database functions DSUM, DAVERAGE, DSTDEV  
Querying External Database Files  
Using Pivot Tables for Analysis