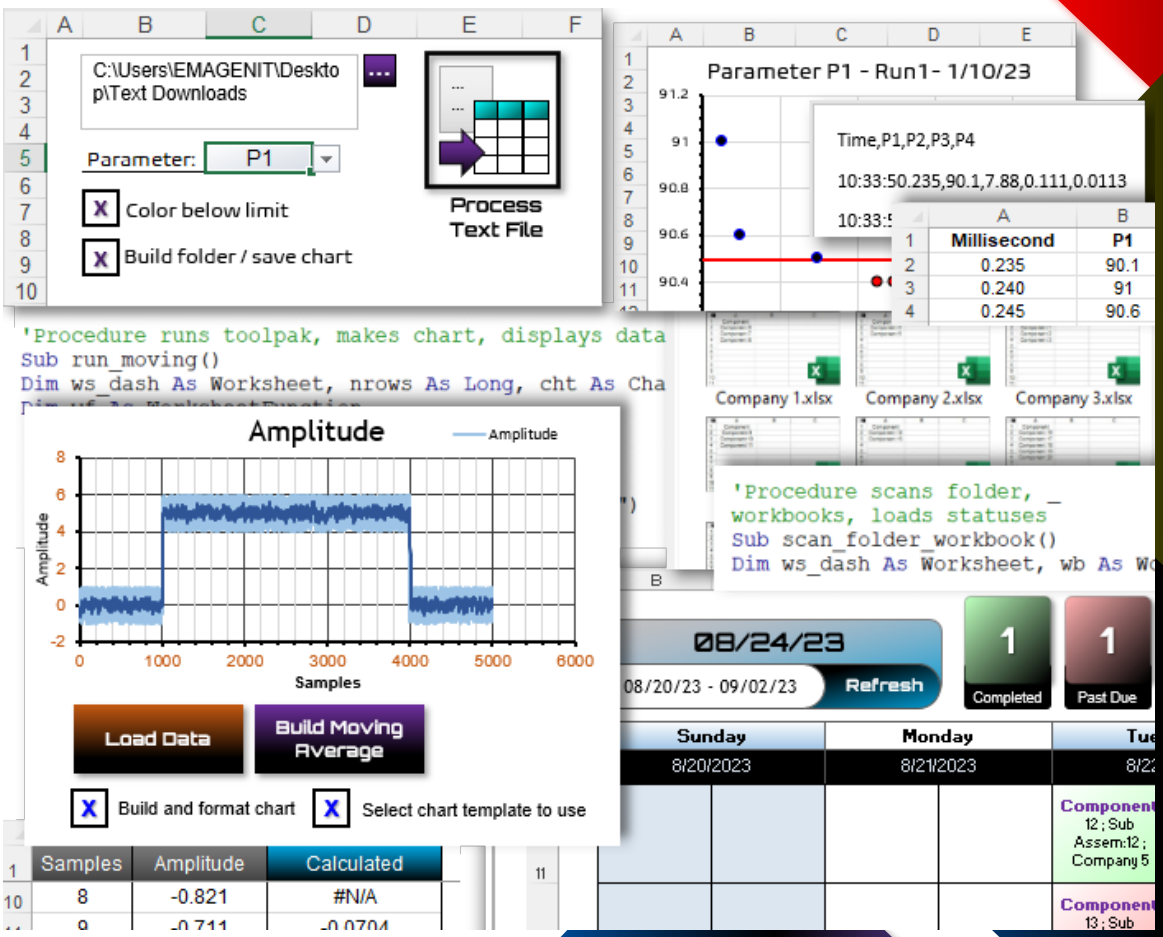
EMAGENIT

State of the art Excel training.

Excel VBA Data Analysis

for Engineers and Scientists



Stop wasting hours manually assembling engineering and science reports in Excel, do it in seconds. Learn to design scalable Excel VBA data tools that calculate, format, integrate, and chart data from multiple data sources, files, and folders.

www.emagenit.com >

How our class can help you.

Our 2-day class shows you hands-on how to combine Excel's "off-the-shelf" data capabilities with VBA to build adaptive, scalable engineering and science data tools.

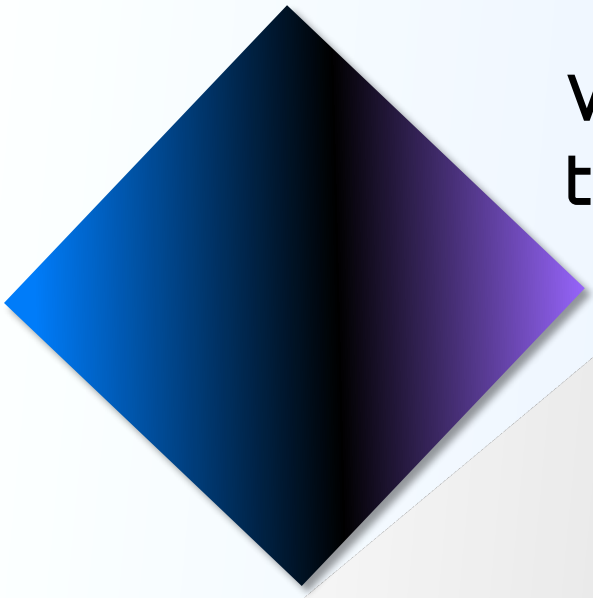
It focuses on using key Excel / VBA elements together to rapidly calculate, reorganize, format, chart, and report various types of engineering and science data.

What you'll master in our class.

It also demonstrates how to create high-powered report tools that process, integrate, and chart data stored in multiple folders, databases, text files, and workbooks.

Also discussed is how to use VBA to read stacked non-standard worksheet / text file datasets and how to automatically email reports to your associates using VBA and Outlook.

Join us and we will show you all you need to know to turn Excel and VBA into a rapid data processing machine that meets your exact needs.



Who should attend the class?

Engineers, scientists, and technicians. Class examples will be determined by those in attendance.

Minimum Excel skills needed for the class.

Select this Excel training if you or your group have:

- Used Excel VBA in a basic manner before
- Used Excel's data tools manually and know them operationally
- Formatted worksheets manually and know Excel's basic formatting capabilities
- Built charts and drawing shapes manually before in Excel
- Used Excel's worksheet functions like MATCH, COUNTIF, SUMIF, VLOOKUP...

How we run the class.

We focus our training on what our customers need. When training begins, we analyze those needs and shift our outline appropriately. We will stress or add topics that our customers want.

Class formats and signup.

In-Person, Virtually, and Onsite. Our live hands-on classes can be attended virtually or in-person. Please visit our public signup page for class times and pricing >. Contact EMAGENIT directly at 805.498.7162 for more information about our onsites.

Key Excel VBA topics covered in class.

- Review of the VBA Editor, its debug tools, and the Excel VBA language
- How to use worksheet and VBA functions in your macro code to analyze and calculate engineering / science data
- Automating and looping Excel's data tools (PivotTables, AutoFilter, Analysis Toolpak...) for large scale data processing
- Controlling the Windows folder system with VBA to store reports and read data
- Building adaptive loops and logic to analyze engineering / science worksheet datasets
- Using VBA to build, fill-in, shape, format, and calculate various engineering / science report tables
- How to use Excel VBA to perform various table lookups and interpolation
- How to use VBA to create, write, and modify text files
- Using SQL, ADO, and VBA to control and integrate text files, databases, and workbooks
- Using VBA and Excel's Query Tools to rapidly filter and integrate data
- Large scale multi-workbook, worksheet, and text file processing using VBA
- Automating engineering / science chart reports with Excel VBA
- How to design worksheet-based user interfaces (UIs) to control your data tools and email your reports

Detailed class syllabus.

Day-1

Excel VBA Language and Editor Review (Discussed Where Needed)

- Excel VBA Editor and debugger review
- Review of the VBA language including variables, data types, constants, arrays, operators, expressions, loops, logic decisions, functions, and calling conventions
- Constructing error handlers and logic to handle run-time errors in your data analysis code
- A review of Excel objects, properties, and methods and how to use them in your macro code
- How to use object expressions and the Set statement in your macro code to track objects
- How to use CreateObject and GetObject to control other programs libraries

Using Functions in VBA to Analyze and Calculate Engineering / Science Data

- Full review of how to run Excel worksheet and VBA functions in your macro code
- How to track ranges, headers, and data subsets using MATCH, COUNTA, Range, Cells, Find, CurrentRegion, Columns, Rows, Address...
- Calculating math, trig, and statistical values in your macros using functions like Sum, Max, Min, ATAN, SIN, Sqr, STDEV.S, RANK...
- Using logical functions in your code like SUMIFS, AVERAGEIFS, MAXIFS, MINIFS, COUNTIFS... to analyze data
- Parsing and merging date time values in your code using functions like Year, Format, DateDiff, DatePart, NETWORKDAYS, EOMONTH...

- Performing calculations on engineering / science tables and placing values or formulas below or beside them

Controlling Workbooks, Worksheets, Folders, and Files with Excel VBA

- Design strategies for storing data in multiple workbooks and folders and using VBA to access them
- Using the FileSystemObject to create, move, delete, rename, and access Windows folders and files
- How to use Open, Add, Close, Save, and SaveAs in your code to control report and data workbooks
- Design strategies for naming workbooks and folders for large scale data storage and access
- Using Add, Delete, Move, Name, Protect, and Unprotect to control report worksheets in Excel VBA

Automating and Looping Excel's Data Tools for Large Scale Data Processing

- How to automate AutoFilter, Sort, Remove Duplicates, and Advanced Filter using Excel VBA
- How to use Record Macro and VBA to automate PivotTables and the Analysis Toolpak
- Determining what statements to keep in the Record Macro code, replacing hard coded arguments, replacing active paths
- Using Excel's data tools inside loops to create large scale data processing tools
- Using macros to build filter logic on the fly for Excel's filters inside loops
- Using macros to copy, paste, and stack filtered data on single and multiple report worksheets

Dynamically Shaping and Formatting Engineering / Science Worksheet Tables

- How to dynamically track resizing worksheet tables in your code using Range, Cells, Find, Columns, Rows, Address, CurrentRegion...
- How to dynamically track moving table headers in your code using MATCH, Find, Column, Row...
- Creating rules on the worksheet to tell VBA what to do with report table columns, rows, formats...
- How to use loops and logic to insert, delete, and move worksheet cells, rows, and columns
- Using Excel VBA to lock onto and format simple and complex engineering / science worksheet tables

Building Loops and Logic to Analyze Complex Engineering / Science Datasets

- Using Range, Cells, and Offset in your loops to access engineering and science worksheet data
- Determining worksheet header positions, table size, and table position on the fly using MATCH, COUNTA, Find, Column, Row, Address...
- How to use cell formats, cell values, data breaks in procedures as logic triggers when analyzing worksheet data
- Using adaptive loops and logic to analyze standard and complex worksheet table patterns like stacked tables, fragmented tables, indented tables...
- Using adaptive loops and logic to process worksheet data and find values like steady state, max, min, limit violations, increments, time...
- Using macros to color cells and create formulas in engineering / science worksheet tables

Using Excel VBA to Build, Fill, and Lookup Data in Engineering / Science Report Tables

- Using Range, Cells, Offset, CurrentRegion, Find, Match... to dynamically track worksheet tables, headers, position, and size
- Building report tables by copying and pasting data rows and columns with VBA
- Building report tables by filling in various data value patterns with VBA
- Using COUNTIF, VLOOKUP, XLOOKUP,MATCH, HLOOKUP, and Cells in VBA to lookup table data and fill in rows / columns
- How to perform interpolation in Excel VBA
- Using macros to automatically build and fill existing report tables including status tables
- How to use VBA to perform calculations and generate formulas in report table columns and rows

Day-2

Controlling and Processing Text Data with Excel VBA

- Cleaning and parsing text in your Excel VBA code using Split, Mid, Replace, Instr, Format, CLEAN, TRIM...
- Automating Text Wizard and Text to Columns to load and parse text data to an Excel worksheet
- Using the FileSystemObject and TextStream objects in VBA to open, close, read, and write to text files
- Writing Excel data to a text file using VBA loops and string concatenation
- Using Do loops, logic, functions, and arrays to scan and analyze text file data and output the results to an Excel worksheet

Using VBA, SQL, and ADO to Control / Integrate Database, Workbook, and Text file Data

- Basic SQL language review
- How to write an SQL query statement and connection string in Excel VBA
- How to use VBA, ADO, and SQL to update, insert, and delete database data
- Using VBA, ADO, and SQL to quickly query data in workbooks, text files, and databases and return data to the worksheet
- Using VBA and SQL to quickly integrate data from different data sources

Filtering and Integrating Data Using VBA and Excel's Query Tools

- Design methods to use Power Query, Microsoft Query, Excel tables, and VBA to quickly integrate and filter data from different sources
- Using Record Macro to record code that automates Excel tables, Power Query, and Microsoft Query
- Determining what statements to keep in Record Macro code, replacing hard coded arguments, replacing active paths
- Controlling query settings with Excel VBA

Large Scale Multi-Workbook, Worksheet, and Text File Processing Using VBA

- Scanning for an open workbook with a specific dataset using For...Each Next loops, logic, and functions
- Scanning multiple worksheets for a specific dataset using For...Each Next loops, logic, and functions
- Scanning folders for specific data workbooks using For...Each Next loops, logic, and functions

- Scanning folders for specific text files using For...Each Next loops, logic, and functions
- Designing scalable procedures that adapt to data in n...workbooks, worksheets, and text files

Building Automated Chart Reports with Excel VBA

- Review of how to use VBA to create chart sheets and embedded worksheet charts
- How to use Excel VBA to create and arrange multiple charts on a worksheet (chart report)
- How to use macros to create engineering / science combo charts
- Loading VBA arrays directly into a chart's series, a must know for emailed chart reports
- How to use macros to create chart limit lines, curve fits, labels...
- How to use VBA to format charts including coloring data points and hiding / displaying series

Designing Worksheet UIs to Control Your Data Tools and Email Your Reports

- Laying out user interfaces (UIs) on the worksheet to control your Excel VBA data tools
- Using the FileDialog object in VBA to construct file and folder pickers for your data
- How to make a simple toolbar using a userform and buttons
- Using Data Validation and ActiveX controls to control user entry on the worksheet
- Controlling and reading ActiveX controls and Data Validation using Excel VBA

- How to create a simple Outlook email macro to automatically mail your reports