Introduction

Our 1-day, hands-on, Microsoft Excel training shows you how to use Excel to perform common engineering and science tasks like problem analysis; data processing; assembling technical displays, building models; and creating your own custom VBA worksheet functions to solve tough calculations. Read-on and see how our Excel training can help you reach your Excel goals.

1. Map display of weather read outs over the Nellis Air Force base range map (data randomly generated). Values are being read from the table below (on another sheet) and are dynamically updated in the tiles above the map if they change. Why are the fonts different in the table, well the class explains things like that. Just some of the display types we can show you how to quickly build in class.
A Review of Formulas, Debugging, Formatting and Interface Design

Overview: Our Excel training will show you how to build formulas that integrate information from single and multiple worksheets. We will also show you how to debug your formulas using Excel's built-in tools, a must know. Along the way we also discuss worksheet formatting, how to organize your interfaces, and use dynamically linked shapes and pictures to create technical views for your worksheet.

1. Our Excel training will show you how to build formulas using cells from the same worksheet and multiple sheets. We also discuss all the syntax used to create the different types of cell references.

2. Our training will also demonstrate how to debug your formulas allowing you to determine how cell information flows through a workbook. We also demonstrate how to observe cell values directly in formulas thus enabling you to find a malfunctioning cell.

3. We will also demonstrate the worksheet formatting techniques we use when building dashboards like how to create drawing shapes that dynamically update when a cell value changes.
Learn How to Use Cell Names, Concatenation and Tables

**Overview:** Our Excel training will show you how to use cell and range names to transmit cell and range values around a workbook to formulas and Excel elements effortlessly. Using names is the key to eventually developing self-adjusting, easy to manage formulas that react to changing data. Our training also demonstrates how to design tables in Excel for use with Excel’s data tools and formulas and also how to build adaptable text formulas using the string concatenation operator &.

### Table Example

<table>
<thead>
<tr>
<th>S/N</th>
<th>Product Type</th>
<th>Date</th>
<th>Defects</th>
</tr>
</thead>
<tbody>
<tr>
<td>K100792</td>
<td>Type 1</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K116841</td>
<td>Type 2</td>
<td>4/13/2019</td>
<td>1</td>
</tr>
<tr>
<td>K111797</td>
<td>Type 3</td>
<td>4/17/2019</td>
<td>1</td>
</tr>
<tr>
<td>K115970</td>
<td>Type 4</td>
<td>4/19/2019</td>
<td>2</td>
</tr>
<tr>
<td>K108647</td>
<td>Type 5</td>
<td>2/22/2019</td>
<td>2</td>
</tr>
<tr>
<td>K100664</td>
<td>Type 6</td>
<td>2/23/2019</td>
<td>1</td>
</tr>
<tr>
<td>K100134</td>
<td>Type 7</td>
<td>2/23/2019</td>
<td>1</td>
</tr>
<tr>
<td>K116780</td>
<td>Type 8</td>
<td>2/29/2019</td>
<td>2</td>
</tr>
<tr>
<td>K101197</td>
<td>Type 9</td>
<td>2/18/2019</td>
<td>2</td>
</tr>
<tr>
<td>K102827</td>
<td>Type 10</td>
<td>2/18/2019</td>
<td>2</td>
</tr>
<tr>
<td>K108654</td>
<td>Type 11</td>
<td>2/29/2019</td>
<td>2</td>
</tr>
<tr>
<td>K115756</td>
<td>Type 12</td>
<td>3/12/2019</td>
<td>2</td>
</tr>
<tr>
<td>K116900</td>
<td>Type 13</td>
<td>3/17/2019</td>
<td>2</td>
</tr>
<tr>
<td>K109177</td>
<td>Type 14</td>
<td>3/23/2019</td>
<td>1</td>
</tr>
<tr>
<td>K119387</td>
<td>Type 15</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K116780</td>
<td>Type 16</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K101197</td>
<td>Type 17</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K102827</td>
<td>Type 18</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K116900</td>
<td>Type 19</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K109177</td>
<td>Type 20</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K106383</td>
<td>Type 21</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K109177</td>
<td>Type 22</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K106383</td>
<td>Type 23</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
<tr>
<td>K106383</td>
<td>Type 24</td>
<td>4/10/2019</td>
<td>2</td>
</tr>
</tbody>
</table>

- **Range named data_prodtype_col.**
- **Range named data_defects_col.**

1. Our Excel training will show you how to design proper tables on the worksheet that can be used with Excel’s built-in data tools, VBA and other external programs you may upload data into.

2. It will also show you how to use names to relay range and cell information to formulas and other Excel features like pivot tables, charts, conditional formatting, data validation,…etc. Learning how to build and use names is key to developing adaptable Excel formulas and other Excel elements. They also make formula construction and upkeep a snap.

3. We will also show you how to use the & operator to build a text formula that calculates text. Called string concatenation, it allows you to construct formulas rapidly that use changing text like logic and is a must know.
Learn to Use Functions Like VLOOKUP, IF, SUMIFS and How to Nest

Overview: Our Excel training will show you how to use and debug key worksheet functions like VLOOKUP, SUMIF, SUMIFS, COUNTIF, COUNTIFS, AND, OR and IF. Our training will explain their syntax, how to write their logic if required, and how to use them in unique data solving ways. These are the core functions that will help you process a variety of data quickly.

1. Our Excel training will demonstrate how to use VLOOKUP to look up data on different sheets using names for simplicity. It will also discuss how to lookup data with spaces and dates as well.

2. It will also demonstrate how to use worksheet functions with text-based logic like SUMIFS. SUMIFS allows you to sum values based on multiple criteria. We will show you the tricks to building the formulas and logic quickly that will save you time and effort.

3. We will also show you how to use the IF function and build its logic using comparison operators like <, >, <=,… and functions like AND and OR. The IF function allows you to make decisions in a formula. We will also show you how to nest functions within functions, how to debug the structure and make sense of it.
Learn to How to Use Eng/Sci Related Functions and Assemble Models

Overview: Our Excel training will show you how to use key worksheet functions that relate to engineering and science. Our training will also explain how to assemble models in Excel and pass large amounts of information between worksheets and workbooks. We also explain how to layout your models so you can later build a model upload/download capability using VBA, perform trade studies and incorporate tools like Solver.

1. Our Excel training will demonstrate how to use eng/sci related functions in your formulas. We will also explain how to construct constants and names that allow for rapid construction of upload/download model features later using VBA. Our training will also provide tips on how to layout the model on the worksheet clearly.

2. Our training will explain techniques on how to pass large amounts of information between worksheets and workbooks linking model teams. We will also explain how to build C&C worksheets that let tools like Solver control the whole model.
Learn How to Build Forms and Use Data Validation

Overview: Our Excel training will show you how to assemble forms on a worksheet that can be used to store data. If designed right, these forms can be used later in formulas and eventually VBA macros. We will also show you how to lock down information in the form using data validation and worksheet protection to control user input. Controlling user input in forms is the key to developing an effective data collection system.

1. A drop down list created with data validation used to correctly enter a standardized part name in the cell. The list is stored on another worksheet.
Learn How to Create and Use Excel Tables

Overview: Our Excel training will show you how to create and use Excel tables in Excel’s data processing tools and formulas. Excel tables adapt automatically to changing data size and are the perfect tool to use when trying to build formulas, pivot tables, charts, reports, … that use changing data. Our training will show you how to leverage their capabilities.

1. Our Excel training will show you how to create, control and name Excel tables. It will also demonstrate how to use the features that are built into the tables.

2. Our Excel training will show you how to use structured references from an Excel table in a formula. It discusses the syntax as well as how to quickly enter them and their capabilities.

3. Excel table on separate worksheet being used in formulas on Head Count Summary sheet. As the table grows, the formulas on the summary sheet do not need to be updated due to the use of structured references. Makes adaptable reports a snap.

4. We will also show you how to use these tables to create pivot tables allowing them to adapt to changing data.
Overview: Our Excel essential training will show you how to use conditional formatting to color data on a worksheet that matches a specific logic criteria. We will show you how to set up its logic and the right option to use for the task at hand.

1. The cells in this example are being colored different shades of red using conditional formatting based on the value of the Short column number. Conditional formatting is also being used to color the data white if there is no problem. The data in the table is being transferred via formula from another worksheet’s Excel table.

2. Excel table on separate worksheet being used to supply values for the inventory worksheet display. It is linked to a database and refreshed automatically which we discuss how to do in our Excel Data Analysis Training.
Learn How to Use Conditional Formatting with Linked Displays

Overview: Our Excel training will show you how to use conditional formatting way beyond just coloring cells. Our training will show you not only how to color worksheet cells in unique patterns, but also color cells then integrate those cell colors dynamically with visual displays. We will also show you how to set up the logic and the interfaces to control the setup.

1. Conditional formatting is being used in a unique way in this example. Cells on the Aircraft worksheet are colored based upon selections in drop downs. Those cells are then dynamically linked to the aircraft shapes on the Flight Deck worksheet so when they color, the picture colors. No color, no color in the pictures. The names are also linked, and the aircraft pictures can be moved manually and positioned. Excel tables and data links can refresh the boards based on data from a database or workbook and they can be set to update at a specific time interval.

2. If this can be done all with formulas, conditional formatting and built in links, imagine what Excel VBA can unleash here. Topics like that are covered in our advanced Excel VBA class.
Learn How to Process Text and Use the Text Functions

Overview: Our Excel training will show you how to use Excel tools like Text to Columns and Remove Duplicates. We will show you how to copy and paste text from a web page or other document onto a worksheet and then parse it. Our training will show you how to remove duplicate values from worksheet tables. We will also show you how to use key text worksheet functions that can help process the text once it is on the worksheet.

1. Our Excel training will show you how to separate delimited text data (i.e., , ; |…) on a worksheet, and then parse it into different columns on a worksheet. A must know if you are receiving text downloads from a program.

2. We will also show you how to use key worksheet text functions like TRIM and SUBSTITUTE to replace and correct data. These functions will help you remove text data flaws thus allowing the data to be used by Excel’s data tools and formulas like VLOOKUP. We will show you a whole lot more than just the basics here.
Overview: Our Excel training will show you how to use AutoFilter, Advanced Filter and Grouping. We will show you new ways to filter your worksheet data past just the basics of using AutoFilter. We will also show you how to use the grouping and subtotal tools to display/hide data and subtotal it quickly if needed.

1. Our Excel training will show you how to use not only AutoFilter, but Advanced Filter as well to filter data on a worksheet. While AutoFilter is powerful, it is limited in filtering capabilities. Advanced Filter can use actual logic formulas to filter data on a worksheet allowing you to develop truly powerful filters.

2. For example, the formula first turns a date column value into a date using SUBSTITUTE()^1, we cover it, then uses the Text function to return its 3-letter month abbreviation and compare it to Jan. When Advanced Filter is run, it will apply this formula to each value in the date column and filter based on it. What this means is you did not have to turn 01.01.19 into a valid date before filtering.

3. We will also show you how to use the grouping tool to help hide rows and columns so individuals can access your worksheet data rapidly.
Learn How to Build Charts and Use ActiveX Controls

Overview: Our Excel training will show you how to build engineering and science charts. We will show you to properly arrange and setup the data, arrange the charts on worksheets for reports and professionally format them. Our training will also show how to do unique things like create limit lines for both the x and y axes, use a secondary axis, curve fit the data and obtain the curve fit equation.

1. Our training will show you how to layout your charts, format them and show adaptive limit lines as data for both the x and y axis.

2. We will show you how to create combined charts that display two or more types of data series.

3. Our training will show you how to use ActiveX controls on the worksheet to control cell input and perform things like trade studies and chart control.
Overview: Our Excel training will show you how to build pivot tables, pivot charts and the worksheet tables that support them. Pivot tables and charts allow you to summarize, organize and visualize data rapidly on a worksheet. We’ll also show you how to use slicers and timelines to filter the pivot data and use Excel tables to simplify pivot construction.

1. Pivot tables are built on worksheets and allow you to rapidly organize and summarize table data via a graphical interface.

2. Pivot charts allow you to visualize the data in a pivot table rapidly. They have built-in drop downs which can filter their data view. We will show you how to build and format them.

3. Slicers are used to rapidly filter pivot tables based upon selected values. When you filter the pivot table, you filter the chart data as well.

4. You can use Excel tables to build pivot tables. Since Excel tables adapt to changing data, the pivot table will not need to be remapped when the table shifts in size, a common complaint.
Overview: Our Excel training will provide you with a brief overview of how to use VBA macros to command Microsoft Excel. Our training also explains how to design your own custom VBA worksheet functions. They can also be used to replace a series of formulas on the worksheet, a complicated IF function structure in a formula, to run numerical analysis routines, query databases,…etc. VBA functions also provide a centralized place to perform equation upgrades for large models.

1. Custom VBA worksheet functions are created in modules in the VBA Editor. We will show you the basics of how to create them with some simple examples. Our manual has all steps and examples on how to make the good ones.

2. This custom VBA function looks for test values outside of the LL and UL limits and returns a n x 3 array containing the test, run and test values. In essence, just a couple of loops, some variables, a piece of logic and an array. We will kick start you on the right topics so you can eventually build things like this.

```vba
Function OUTSIDELIMITS(LimitRange As Range, DataRange As Range) As Variant
    Dim r As Long, c As Long, limit_array As Variant
    Dim data_array As Variant, i As Long, out_array() As Variant
    limit_array = LimitRange.Value
    data_array = DataRange.Value
    For r = 2 To UBound(data_array, 1)
        For c = 2 To UBound(data_array, 2)
            If data_array(r, c) < limit_array(1, c) Or data_array(r, c) > limit_array(2, c) Then
                i = i + 1
                ReDim Preserve out_array(i, 3)
                out_array(i, 1) = data_array(r, 1)
                out_array(i, 2) = data_array(r, c)
                out_array(i, 3) = data_array(r, c)
            End If
        Next c
    Next r
    OUTSIDELIMITS = WorksheetFunction.Transpose(out_array)
End Function
```