Course Content

Course Description:
Students participating in this 3-day course will learn how to:
- Understand which tool or technique to use in a given situation
- Understand data gathering and input considerations
- Understand how to set it up and run it in Excel
- Understand how to interpret the results
- Understand key pitfalls be aware of and avoid
- Understand how to visualize and communicate the results in a fair, objective and unbiased manner

At Course Completion:
They will leave the course able to use Excel to build statistical models that answer questions like:
- What's the relationship between a variable and an outcome?
- If I adjust X, what will be the impact on Y? Are there natural limits I should be aware of?
- What's coming next? Are we going up or down and by how much?
- Why are we going up or down? How impactful is each variable? (in other words, what should I focus on first?)
- Are there any unusual outliers? What caused those? Do I need to do something about this?
- How likely is any given idea or decision or campaign to be successful? (i.e. logistic regression)
- Did any given change or decision make a material business impact?

Prerequisites:
- Students have access to Microsoft Excel and are familiar with writing calculations and formulas within Excel

Topics:
Section I: Background Information
- Why Use Statistics?
- Installing the Data Analysis Tool Pack add-in for Excel

Section II: Analysis Fundamentals
- Exploring and visualizing data
  - Types of variables and how to visualize each
- Descriptive statistics
  - Uses for specific measures and how to visualize
    - Samples vs. populations
    - Confidence Intervals
    - Average, median, standard deviation, quartiles & percentiles
    - Looking at the shape of the data and the impact of outliers

- - - Cautions and common pitfalls (e.g. Anscombe's Quartet)
  - Dealing with bad data and ensuring it's reliable for good decisions
- Overview of Probability

Section III: Predictive Models
- Method for Creating Predictive Models
- How to Choose an Appropriate Model
- Regression
  - Correlation
  - Linear Regression
    - When to use it
    - How to interpret meaningfully
    - For nonlinear data
      - Exponential Regression
      - Logarithmic Regression
      - Polynomial Regression
  - Multivariate
- Logistic Regression
- ANOVA
  - t-Test
  - One-Way ANOVA
  - Two-Way ANOVA
- Chi-Square
- Time Series & Forecasting