Curve Fit Installation:

1) Unzip ***Curve Fit.zip***
2) Close all instances of ***ArcMap 10.x***
3) Run ***Curve Fit.msi,*** install ***Curve Fit*** to a local drive
4) Start ***ArcMap 10.x***
5) Click on the ***Customize*** menu and then the ***Customize Mode…*** menu item
6) On the ***Customize*** dialog, click the ***Commands*** tab
7) Scroll down and click on ***Fox Tools*** in the ***Categories*** list
8) Drag the ***Curve Fit*** button to a toolbar on the ***ArcMap 10.x*** interface

Curve Fit Use:

1) Open an ***ArcMap 10.x*** project that contains a series of input raster datasets.
2) Click the ***Curve Fit*** button (see above: *Curve Fit Installation*)
3) A dialog containing 5 tabs will open (tab headings: ***Input***, ***Function***, ***Nonlinear Optimization***, ***Output***, and ***Settings Summary***).
4) ***Input*** tab
    a. With the ***Input*** tab active, click on the ***Add Raster Layer*** dropdown list and select a raster layer to be added to ***Curve Fit***. Once the layer is selected, click the ***+*** button to add the layer to the table of input layers. The title of the layer will appear under the ***Y Values*** column. Repeat this process until all of the layers from the data series are added to the table. As an alternative, you can use the ***+ All*** button to add all of the raster layers in the active data frame. If you added a layer twice or inadvertently included a layer you wish to omit, pressing the ***Delete*** key will remove the active row from the table.
    b. Once the raster layers have been added, enter the numeric ***X Values*** for each input layer.
5) ***Function*** tab
    a. Select an appropriate function to be modeled (available functions: ***Exponential***, ***Four Parameter Logistic***, ***Linear***, ***Polynomial***, and ***Power***)
    b. If the ***Polynomial*** function is selected, enter the desired degree of polynomial in the textbox (degree > 1).
6) ***Nonlinear Optimization*** tab
    a. These settings are optional and are available when using a nonlinear function (***Exponential***, ***Four Parameter Logistic***, or ***Power***)
    b. ***Lower Bound***, ***Upper Bound***, and ***Initial Value*** for each function parameter can be set in the ***Parameter Constraints and Initial Values*** table. Use identical values for the ***Lower Bound*** and ***Upper Bound*** to constrain a parameter at a constant value.
    c. The ***Min*** and ***Max*** number of iterations define the range of iterations used in the solution.
    d. Solution tolerances and convergence criteria can be set to specific values for nonlinear functions.

i. ***Absolute Tolerance*** is the absolute value of the difference between the modeled result and the actual value. The ***Absolute Tolerance*** specifies the largest value allowed.
ii. The ***Relative Tolerance*** is the ratio of the absolute value of the difference between the modeled result and the actual value. The ***Relative Tolerance*** specifies the largest value of the ratio that is allowed.

e. The ***Convergence Criteria*** specifies the criteria used for the algorithm to exit its iterative analysis (***Convergence Criteria*** options include: ***Absolute Tolerance***, ***Relative Tolerance***, or ***Either Tolerance***).
f. The ***Require Convergence*** checkbox
   i. If ***Require Convergence*** is *checked* and the ***Convergence Criteria*** is not met before ***Curve Fit*** runs out of iterations, then ***Curve Fit*** will output the ***No Data*** for that pixel.
   ii. If ***Require Convergence*** is *unchecked* and the ***Convergence Criteria*** is not met before ***Curve Fit*** runs out of iterations, then ***Curve Fit*** will output the current value for the solution at the time the iterations ran out.

7) ***Output*** tab
   a. The ***Directory*** textbox identifies the output location for analytical results.
   b. The desired ***Raster Products*** section of the ***Output*** tab contains all of the output options for ***Curve Fit***. It is advisable to be frugal when selecting output products. There is a direct linear relationship to the length of processing time and number of products selected. All raster products are output as IMG files.
   c. The ***Output Product Precision*** choices are ***Single Precision*** or ***Double Precision***. There is an exponential relationship in the amount of hard disk space required when selecting between ***Single Precision*** and ***Double Precision*** output products.
   d. The ***No Data Value*** textbox allows the use to specify a specific no data value (must be an integer value). The default ***No Data Value*** is -999,999,999.
   e. At least 1 raster product must be selected, ***Raster Products*** include:
      i. ***Adjusted R^2***, ***Akaike Information Criterion***, ***Bayesian Information Criterion***, ***Coefficient of Variation*** (available for linear models), ***F Statistic***, ***Log-likelihood***, ***P Value***, ***R^2***, ***Residual Sum of Squares***, and ***Standard Error***.
      ii. Parameter estimates (***Value***) and parameter specific statistics (***Standard Error***, ***P Value***, and ***T-statistic***) are generated by selecting the appropriate checkbox in the ***Parameters*** table.
      iii. Residual error for specific input data points are generated by selecting the appropriate checkbox in the ***Residual Errors*** table.

8) ***Settings Summary*** tab
   a. Creates a textual summary of inputs, function settings, and output products.
   b. Confirms that required settings are met prior to executing analysis.
   c. Items in red text need to be address before ***Curve Fit*** can be executed.
   d. A text file containing the complete contents of ***Settings Summary*** tab is written to the output folder each time ***Curve Fit*** is executed.