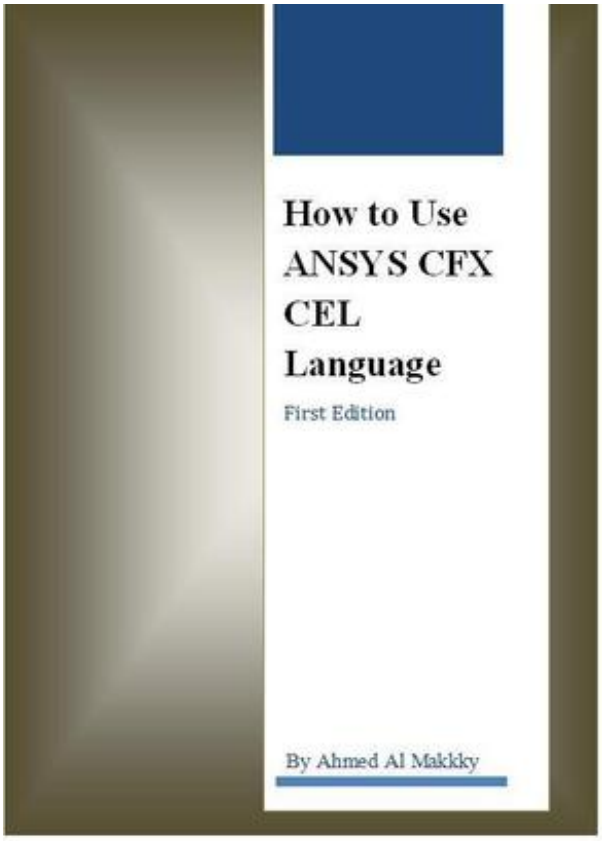
ANSYS Fluid Dynamics Tutorial Inputs.zip



zip. Introduction {#sec001} ========== In this tutorial you will learn how to use the Processing programming language to create a parameterized model of a pond. Specifically, you will learn how to automatically find the parameters that best fit a simple static model of a pond to given data. The data that you will use as inputs are the relationship between air-water interface elevation (*h*) and the volume of water in the pond (*V*), from which you will derive the rate of inflow (*Q*) and outflow (*P*), the air-water interface elevation (*h*), and the water depth (*d*). This will allow you to create a static model that we will test using the code that is provided to you. The best way to follow the tutorial is to read the instructions in each section as they are presented, and then also type the commands in the editor window directly after each step in the program. The tutorial is divided into three parts. In the first part we will create the program that you will use to simulate an air-water interface in a pond. We will show how to use the command that we will implement to create the air-water interface. In the second part, we will look at the model of a pond that is created by the program. We will show how to create a simple loop to simulate the pond, and also show how to graphically display the data that we will collect and also the model that was created. In the third part, we will look at how to parameterize a simple static model of a pond. We will show how to use a non-linear curve-fitting algorithm to estimate parameters for the pond and look at how the model fits the data. 1.1.. Air-water interface in a pond {#sec002} ---------- The simulation that we will create is a two-dimensional model of an air-water interface in a static model of a pond. The location of the air-water interface will be constant with time and will be represented by a horizontal line. The depth of the water will be constant but the volume of the water in the pond will increase and decrease as air and water are added and removed from the pond. The depth of the pond (*d*) and the water level (*h*) at any given time will be related by the equation *d* = *h* + *V*, where *V* is the volume of water in the pond and *h* is the 82157476af