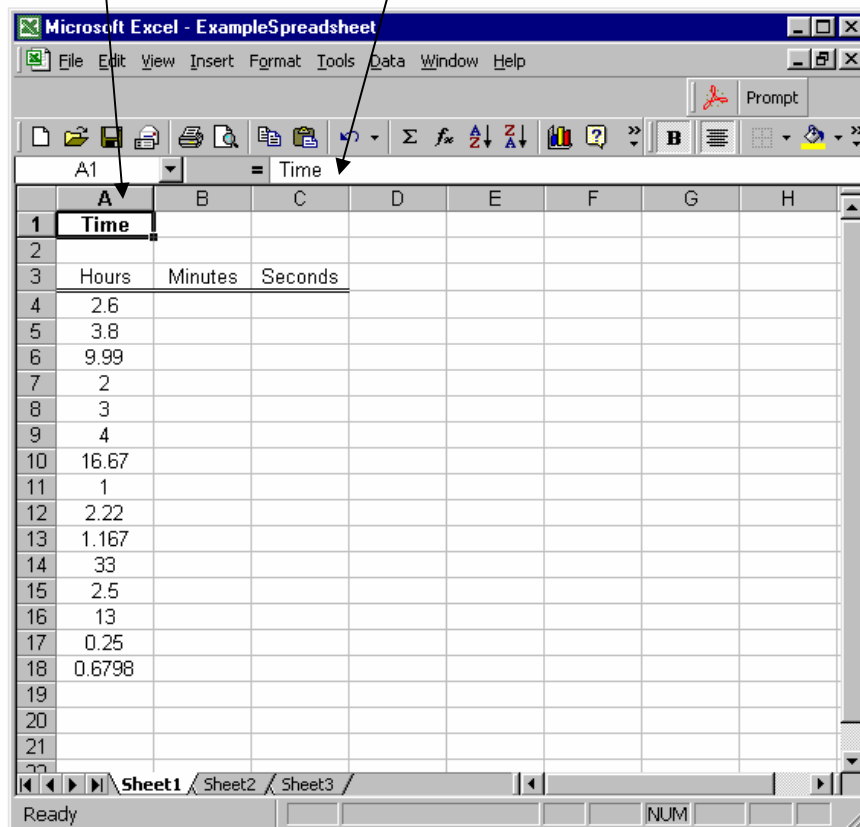


## Down to the Basics

### Spreadsheet:

The cell is the building block of any spreadsheet. Each cell is identified by a specific column and row. The spreadsheet uses capital letters to identify columns and numbers to identify rows. The juncture of the column and the row is the cell identifier. The power behind spreadsheets is in the users ability to build models by referencing cells rather than the data itself. That way when data changes so do the results. For example, if a cell referenced two other cells one containing the number 7 and the other the number 5 any change to either the 7 or the 5 would be represented in the results of the third cell.

Note in the spreadsheet below that the cell at the top left has a black border. This indicates that the cursor is positioned on the cell in column A row 1, that the cell is currently active and that the user can enter data within. The cell contains the word "Time" both in *Cell A1* and in the *data entry field* immediately above the actual spreadsheet.



After selecting the cell with either their mouse or keyboard the user may enter new data or modify existing data within that cell through the *data entry field*. The user may immediately begin typing text, numbers, cell references or functions. The *data entry*

*field* displays whatever the user types and the cell displays the result. The user may also modify what is in the currently active cell by using their mouse to redirect the cursor to any spot within the *data entry field* and make the desired changes.

To enter data into a spreadsheet, use your mouse to move the cursor to the desired cell and select it by “clicking” your left mouse button (for PC users). To move to adjacent cells it is easier to use the keyboard Tab, Arrow or Enter keys. The Tab key moves one cell to the right with each depression, the arrow keys move up, down, left or right and the enter key (default setting) moves down one cell. Holding the Tab, Arrow or Enter keys results in a multiple moves until the user releases the key.

Other basic key sequences for moving and scrolling in a spreadsheet include:

<b>Press</b>	<b>To</b>
Arrow keys	Move one cell up, down, left, or right
CTRL+arrow key	Move to the edge of the current data region
HOME	Move to the beginning of the row
CTRL+HOME	Move to the beginning of the worksheet
CTRL+END	Move to the last cell on the worksheet, which is the cell at the intersection of the rightmost used column and the bottom-most used row (in the lower-right corner), or the cell opposite the home cell, which is typically A1
PAGE DOWN	Move down one screen
PAGE UP	Move up one screen
ALT+PAGE DOWN	Move one screen to the right
ALT+PAGE UP	Move one screen to the left
END	Turn End Mode on or off
END, arrow key	Move by one block of data within a row or column
END, HOME	Move to the last cell on the worksheet, which is the cell at the intersection of the rightmost used column and the bottom-most used row (in the lower-right corner), or the cell opposite the home cell, which is typically A1

With a spreadsheet you can display data and more importantly you can develop a model that reflects the impact of changes to any of the contained data. You may also include text to describe what you are doing and graphs to visually display results. Spreadsheets include numerous powerful mathematical functions, logical if - then - else functions, date and time functions, statistical functions, lookup functions and database functions. All of these functions enable the user to develop models where the data within the spreadsheet is interconnected. Changing a single factor changes the results.

Excel has many equations and functions that you can use to perform both simple and complex operations. Excel has a nice feature for the novice and the expert user with its “Paste function” wizard. Click on the ***fx*** icon and follow the directions to calculate values using functions.

As an engineering student, it is worth your time and energy to master at least the basics of excel. I have included a couple good reference books on the use of excel for engineering, but there are many handbooks out there that will be more than sufficient for your needs. Once mastered, excel is an excellent tool.

#### Reference Texts:

Gottfried, B. Spreadsheet Tools For Engineers Using Excel, New York: McGraw Hill, 2003.

Bloch, S. C. Excel for Engineers and Scientists, 2<sup>nd</sup> Ed., New Jersey: John Wiley and Sons, 2003.