Learning Objectives

- Spreadsheets
- Cells and cell formatting
- Typing Formulas
- Common Excel functions
- Copying formulas
- Absolute and relative referencing
- Graphing

Spreadsheets

- Spreadsheets were originally paper grids used by accountants and businessmen.
- Excel is an electronic implementation of a spreadsheet.
- Excel spreadsheets are now routinely used by engineers to solve many design problems.

Microsoft Excel “Ribbon”

- Ribbon is the new feature introduced by the Microsoft Excel 2007.
- Lets you access all the required tools buttons and options quickly.

Spreadsheet Anatomy

- Perform same calculations repeatedly
- Working with tabular information
- Producing graphs
- Performing parametric analysis (what if studies)
- Presenting results in an organized and readable form.
Cells

- Each rectangle of a grid is called a cell.
- You can enter names (labels), numbers and formulas (equations) in a cell.
- To enter a name or number click on a cell to “activate it” and type in that cell.
- To enter a formula, you have to start with “=” sign to notify Excel that it is a formula.

Cell Formatting

- Cells can be formatted to display different fonts/colors.
- They can also be formatted to display different types of numbers like currency, percentage.
- To format a cell, Right click on the cells and choose “Format cells” option.

Typing formulas

- Several mathematical operations can be performed in the Excel spreadsheets.
- All the formulas should start with “=”.
- Press Enter to display the result of the formula.
### Excel functions

- Numeric or mathematical functions
- Statistical functions like sum, average, standard deviation
- Financial functions
- String functions

### Area of a rectangle

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

### Area of several rectangles

No need to enter the formula several times. Just copy and then paste the formula into the cells below.

### Area of several rectangles (fill handle)

Note the little + symbol on the bottom corner. It is called the fill handle. Hold and drag to fill the rest of the entries.

### Relative referencing

- In the formula bar, note that the formula changes automatically when you paste the formula.
- The automatic incrementing of the cell addresses during the copy process is called **relative referencing**, which is an important Excel concept

### Absolute referencing

- Sometimes we do not want excel to increase the cell numbers automatically.
- This is called absolute cell addressing.
- You can make any cell address absolute by adding $ signs as $A$2. This tells Excel not to increment both columns and rows. Note, in this example the column is fixed at “A” and the rows at “2”.
- If you want to fix just the column type $A2.
- If you want to fix just the row then type A$2.
Area of circles

Since the value of Pi is constant we use an absolute address to fix both the column and the row; so that its value does not change when we calculate the area of the circle.

How to display cell formula?

The above spreadsheet shows computed values (areas) in the cells. EXCEL has another option that will let you view the actual cell formula instead of the numbers. To see this hit the "Ctrl" and "~" keys at the same time, you will get the result shown on the RHS. If you hit these keys again it will go back displaying the numbers.

Report preparation

• Discuss print screen option
• Show how to make word reports using print screen/ Paint or using crop option in Word.

HW/LAB work

• Discuss the loan problem
• Discuss the straight line example