Excel 2010: Automating Grading Tasks
Learning Guide

Why use Excel to grade students?

The primary reason why many instructors and teaching assistants already use Excel documents to store and manage course grades is that Excel's functions and formulas allow you to assign grades quickly and easily. The techniques in this learning guide will help you perform grading-related tasks that are extremely tedious and labor-intensive when done manually.

Which tasks can be automated?

Although Excel can automate almost any task involved with grading, this guide will emphasize:

- **Calculating weighted final numeric grades for each student** Weighted final grades are composed of individual grades students have received for each course assignment, taking into account the importance of each assignment within the structure of your course.
- **Assigning letter grades to each student's numeric grade.** Once you have calculated a numeric final grade, Excel makes it possible to automatically assign a letter grade for each student.

Note: The Excel spreadsheet that is used as in this tutorial can be downloaded **here**. Because this tutorial will continually reference the sample worksheet, it is highly recommended to use it as a template for your own document.

Creating a grading spreadsheet for your course

Before creating your spreadsheet, you will need the following prerequisite information:

1. The name of each student.
2. His/her grade on each assignment.
3. What percentage of the final course grade each assignment will be worth.
4. If you do letter grades, what your grade distribution is; i.e. an A = 93.0-100, A- = 92.9-90.0, etc.

To create your grading spreadsheet:

- At the top of your spreadsheet, create a section listing each course assignment and its weight in the final grade divided by 100. So, for example, if the midterm exam if 35% of the student's final grade, **Midterm Exam** would have a value of `0.35`.

Weighting			
Assignment:	Midterm	Paper	Final
Weight	0.35	0.2	0.45

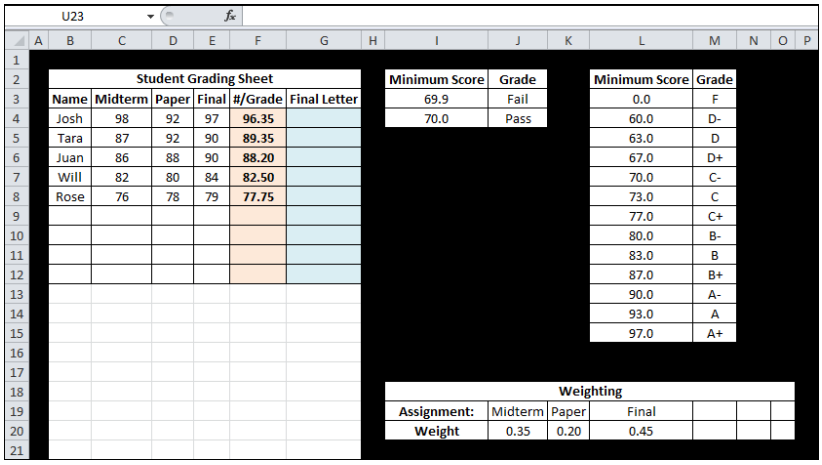
- Create a section that lists each grade (either letter or pass-fail) and the minimum final point value (without dividing by 100) needed to earn each grade. These tables must have only two columns and must be sorted in ascending order (from smallest to largest). Also make sure that the numerical score is on the left and the corresponding letter grade to the right, as below.

Letter Grades		**Pass/Fail**	
Minimum Score	**Grade**	**Minimum Score**	**Grade**
0.0	F	69.9	Fail
60.0	D-	70.0	Pass
63.0	D		
67.0	D+		
70.0	C-		
73.0	C		
77.0	C+		
80.0	B-		
83.0	B		
87.0	B+		
90.0	A-		
93.0	A		
97.0	A+		

- Create a section for the students' grades. This section will include each student's name, as well as his/her assignment grade, overall weighted grade, and final letter grade.

Student Grading Sheet					
Name	**Midterm**	**Paper**	**Final**	**#/Grade**	**Final Letter**
Josh					
Tara					
Juan					
Will					
Rose					

- As the course progresses, manually record each student's assignment grade into this course document. At the end of the semester (before calculating final grades), your spreadsheet might look something like this:



Student Grading Sheet					
Name	Midterm	Paper	Final	#/Grade	Final Letter
Josh	98	92	97	**96.35**	
Tara	87	92	90	**89.35**	
Juan	86	88	90	**88.20**	
Will	82	80	84	**82.50**	
Rose	76	78	79	**77.75**	

Minimum Score	Grade
69.9	Fail
70.0	Pass

Minimum Score	Grade
0.0	F
60.0	D-
63.0	D
67.0	D+
70.0	C-
73.0	C
77.0	C+
80.0	B-
83.0	B
87.0	B+
90.0	A-
93.0	A
97.0	A+

Weighting			
Assignment:	Midterm	Paper	Final
Weight	0.35	0.20	0.45

Note: *The black outlines and the red-and blue-shaded columns are just there for decoration and do not serve a functional purpose. The extra cells in the* ***Student Grading Sheet*** *and* ***Weighting*** *sections serve in case you wish to add students or assignments.*

Calculating a student's final course grade

Once you have entered all the assignment grades into your spreadsheet, you are ready to calculate a weighted final grade for each student. To calculate the weighted final course grade for Josh (using the sample above), you would follow this approach:

- Determine each weighted assignment grade by multiplying Josh's grade in that assignment by the weight of the assignment. For example, Josh's grade on his midterm was a 98 and the weight of the midterm is 35% (0.35), so Josh's weighted midterm grade is `98*0.35`.

- Add together all of the weighted assignment grades to produce his weighted final course grade.

Calculating a weighted final course grade in Excel

- Navigate to the red-shaded `#/Grade` cell where you would like the first student's weighted grade to appear, and type:

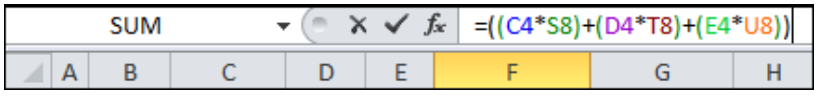
```
=((Midterm Grade*Midterm Weight)+(Paper Grade*Paper
Weight)+(Final Grade*Final Weight))
```

  - In the above formula, replace each written term with the appropriate cell name: i.e., you would erase `Midterm Grade` and type `C4`.
  - Remember to keep parentheses around the two terms being multiplied: `(Paper Grade*Paper Weight)`
  - Immediately after the equal sign and right before the end, there should be two parentheses, as above.

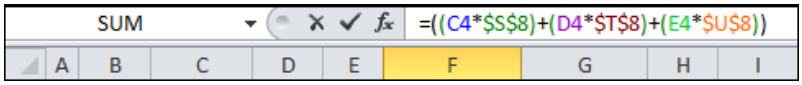
Copying the grade calculation formula

Once you have constructed the formula that will calculate a weighted final course grade for the first student in your class, you can copy that formula so it will calculate grades for the remaining students in your class. Before copying a formula to other cells, you will need to ensure that Excel continues to use the same references to the cells containing each assignment's weight. You do so by making the weight cells "constant"; or ascertaining that Excel will always multiply each grade by the same weight rather than change the weight to a different cell and hence different value. Once you have made the weight cells constant, you will be able to copy the calculation formula so that it works for all of your students.

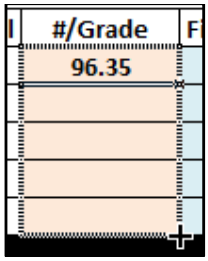
- Click on the cell with the previously created formula.
- The cell's formula will appear in Excel's **Formula** bar, located above the column headings of your worksheet.



- Click the cursor in front of the cell reference you wish to make constant (in this case, cells `G12`, `H12`, and `I12`).
- Place your cursor after each multiplication sign and press the **F4** key to make the cell reference constant. When you have finished, the formula should look like the below graphic. Note the dollar signs before each letter and number of the constant cell references.



- Press the **Enter** key to finalize the changes to your formula.
- Select the bottom-right corner of the cell containing your grade calculation formula. A cross-shaped cursor (✚) will appear, and the cell will be surrounded by a densely dashed line.
- While holding down the left mouse button, drag your cursor to the bottom-right corner of the last cell you want to copy the formula into, and then let go of the mouse.
- The formula will be copied down to each cell.



Additional guidelines for creating formulas

- All formulas must begin with the = symbol. Excel will not recognize your formula as formula without an = as the first character.
- Excel uses the following symbols as mathematical operators.

The symbol…	Is used for…
*	Multiplication
/	Division
+	Addition
-	Subtraction
^	Raise to an exponent

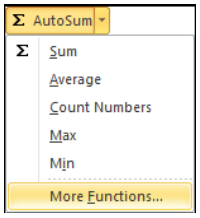
- Excel calculates your formula in the following order:
  - From left to right
  - Starts with any exponents
  - Performs all operations within parentheses.
  - Then performs any *multiplication* and/or *division*
  - Followed by *addition* and/or *subtraction*.
- To perform a calculation that does follow the previously described order, use parenthesis to indicate the order in which your formula should be calculated.
  - *In the formula* `=(8-3)*4`, *Excel will subtract the values in the parenthesis before multiplying.*

Assigning letter or pass/fail grades

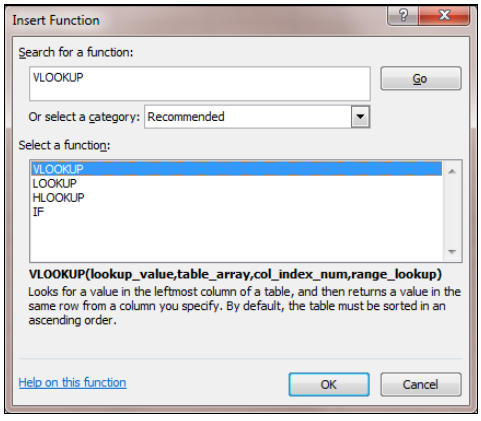
Excel's =VLOOKUP function allows you to automatically assign letter grades based upon the calculated weighted final grades for each student.

To calculate a student's letter or pass/fail grade:

1. Select the cell into which you wish to assign the first student's passing or failing grade.
2. From the **Home** ribbon, go to the **Editing** tab and click on the down-facing arrow of the **AutoSum** button.
3. From the drop-down menu that appears, select **More Functions…**



4. The **Insert Function** window will appear.
5. Search **VLOOKUP** in the **Search for a function:** textbox and select **VLOOKUP** from the bottom pane.



6. Excel will display the **Function Arguments** window.
   You may need to drag this window to another location on the screen so you can clearly see the cells you wish to select.
7. Click in the **Lookup_value:** text box.
8. Click on the cell containing the weighted final grade for the first student in your course.
9. Click in the **Table_array:** text box.

11. Depending on whether you want to calculate the letter or pass/fail grade, select the entire desired table of grades (below the **Minimum Score** and **Grade** headers), starting at the upper left and ending at the bottom right. The table will be surrounded by a "moving" dashed line.

Minimum Score	Grade
0.0	F
60.0	D-
63.0	D
67.0	D+
70.0	C-
73.0	C
77.0	C+
80.0	B-
83.0	B
87.0	B+
90.0	A-
93.0	A
97.0	A+

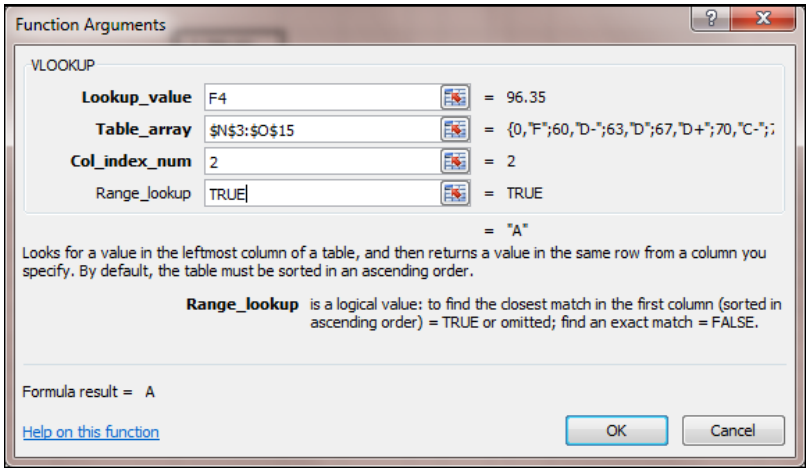
13R x 2C

OR

Minimum Score	Grade
69.9	Fail
70.0	Pass

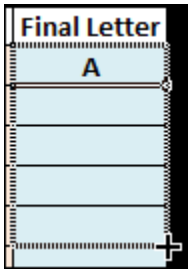
2R x 2C

12. Insert your cursor to the far left of the text box, before any text, and press the **F4** key. The familiar dollar signs will appear.
13. Insert your cursor immediately to the right of the colon and press the **F4** key. *Your Table_Array textbox should resemble this:* Table_array $N$3:$O$15 = {0,"F";60,"D-";63,"D";67,"D+";70,"C-";
14. Click in the **Col_index_num:** text box.
15. Type just the number `2`.
16. Click in the **Range_lookup:** text box.
17. Type just the word `TRUE`.
18. Click on the **OK** button to finalize your function.
    *The below graphic shows how the final **Function Arguments** window looks in the example worksheet.*



19. Repeat steps 1-18 again with a different **Table_array** selected to calculate the pass/fail or letter grade.

20. Select the bottom-right corner of the cell containing your pass/fail formula. A cross-shaped cursor (⊞) will appear, and the cell will be surrounded by a densely dashed line.
21. While holding down the left mouse button, drag your cursor to the bottom-right corner of the last cell you want to copy the formula into, and then let go of the mouse.



22. The formula will be copied down to each cell.