

Electric Field Computer Lab

1. Open “EM Field” on your computer and explore for 5 minutes. Get to know the program and how to use it.
2. Open up Microsoft Word and save a document titled “*your name* EM Field Lab 1011 onto the desktop.”

Part A: For each of the following situations:

Situation #	Situation Description
1	1 positive charge on the screen
2	1 negative charge on the screen
3	1 positive and 1 negative charge of the same magnitude on the screen
4	2 negative charges of different magnitude
5	2 positive charges of different magnitude
6	1 positive and 1 negative charge (at least 3 levels of magnitude different)

Create a field picture on your computer work space that includes the following choices on the “Field and Potential” menu. When you are done with each situation you should have pictures that include a minimum of the following:

- 25 Field Lines
 - 10 different Field Vectors. At least five of these need to be on the same Field Line
 - 10 different Equipotential lines.
 - 10 Potentials. (At least 5 of these should be on the same Equipotential line.)
2. Once each picture is complete press the “Fn” key and then simultaneously press “Print Screen” key.
 3. Then open up your Word document, right click and select “Paste.”
 4. If you know how, crop your picture at this point. Press “Save”
 5. You can achieve a new blank workspace by selecting “3D Point Charges” again.

Part B: Electrostatic Landscapes

1. After you have “print Screened” and “Pasted” situation # 6, **DO NOT ERASE** it from your work station. Instead go to “Display” and select “Clean Up Screen” and then select “Show Grid.”
2. Go to the “Field and Potential” menu and select “Potential.”
3. Take your cursor to the top-left point and click on it.
4. Then take your cursor to **every other** point (vertical and horizontal) on the grid and click on those points.
5. When you are done you should have 5 rows and 10 columns of numbers in the same pattern as the example demonstrated at the front of class.
6. If you make a mistake, do not start over. Simply exclude unnecessary data when you do step #10.
7. Add 10 or so Field Lines and Equipotential Lines.
8. Again “Print Screen” and “Paste” this data onto your Word document.
9. **At this point, obtain a copy of this Word document by either e-mailing it or placing it on a Flashdrive.** Be sure to send a copy to your lab partners so everyone can make their own excel graph and hand in their own copy of the lab.
10. Enter all the values on your grid into an Excel spread sheet exactly as they lie on the grid.
11. Select and highlight all of your data.
12. Create a chart by selecting “Surface Chart” and continue until chart is finished. There will be no title, label or axis labeling on this graph.
13. Rotate the graph until you get the view you desire.
14. “Cut” and “Paste” your Excel data and graph onto your Word Document separately. Make the graph as big as possible.
15. Obtain a copy of this Excel sheet by using the same method as you did in step #9.
16. At Home Print out your Word Document and bring to next class. You must print out your own document to get credit.
17. At Home also go to the internet and find a Topographical Map of a local area about 1 square mile in area. Either print this out separately or somehow “Paste” this Topographical Map onto your Word document. You must print out your own map to get credit.