APPL 150

Semester Report

I’d like you each to choose a material or class of materials that is interesting to you and do research on it in order to write a report. In your report, I am looking for you to write about materials science concepts that specifically relate the atomic and micro scale structure to the processing methods used and the resulting materials properties, and how these properties are beneficial for the application. I’m looking for real, hard facts, not a fluff piece using “weasel words.” A good paper will be of interest to a scientist or engineer.

Some questions you might address (you may not be able to find information to address all of them) include: What are the atomic structure, chemical properties, and macroscopic (i.e., for a composite) properties of the material? How is the material refined and processed for use in the application (and how does that processing modify their structure on the atomic scale?) How are the mechanical, electrical, optical, thermal, corrosive, and/or magnetic properties particularly well-suited for the application? Are there economic considerations which dictate the choice of material and its processing method? Are there environmental considerations at play? Is there ongoing research in improving these devices? If it is highly relevant, you may briefly address some historical development of your material, however, I don’t want to see a large portion of your paper devoted to history; focus on the materials science and engineering.

Choosing a topic that is neither too narrow nor broad in scope is important! I also ask that each student choose a unique material so that there is not overlap. As such, you will be turning in a list of 2-3 suggested topics for your report. These topics must include both the material or class of materials that you are going to discuss, and the application(s). This will allow me to give you feedback so that your topic of research is likely to result in a good paper. If there are multiple students with the same first choice, I will randomly select which student gets it.

Timeline:
Tuesday, March 19: – Turn in your proposed topic (as a separate sheet from your HW).
Thursday, March 21: – Receive my feedback on acceptability of your topic & refine if needed
Tuesday, April 23: – Papers due at the beginning of class, or turn in under the door of my office anytime earlier as long as it is more than 15 minutes before class (if I find papers under my door after I leave to teach class, they will be late).

Format Requirements:
Number of pages: at least 5 full pages but no more than 7 (NOT including citations).
Citations: You MUST include at least 4 citations (with a maximum of as many as you wish). The citations must represent archived publications (not just blogs – videos are not acceptable unless
there is an associated text transcript), and at least 2 of these citations must be from an advanced scientific book or journal article (not just a textbook or newspaper article). Please do not challenge me on this point, the UNC library offers a wonderful scientific repository at your fingertips, and if you have not done so already, it behooves you to learn how to use it (<insert here my stories about having to do my PhD research in dusty basements and shell out for the photocopy machines>). In the text of your report, you might cite an article something like this,[1] with your reference list at the end.[2] I’m not fussy about the exact format you use in your reference list, but please include the paper title. **HINT:** When on campus you have automatic access to our library’s E-journals. Off campus you can go to the library’s E-journal page, click on the journal name and log in with your onyen to access an article. For searching, I personally prefer “google scholar,” please try this first if you are lost about where to start looking. Wikipedia is a great place to learn what questions to ask, but the citations in Wikipedia tend to be for a non-scientific audience.

This handout uses the required margin, font, and spacing requirements, which are as follows:

Margins: 1”

Paper Size: 8.5” x 11”

Font: Times New Roman

Font Size: 11 point

Line Spacing: 1.5

Sub-headings: You may have one-line sub-headings every few paragraphs (as in this handout), but no blank lines between paragraphs.

Pictures: You may include up to ½ page of pictures that count toward your page total and, if needed, more that do not count toward the total. In all cases, sources of pictures must be given.

Indentation: Beginning line of each paragraph should be indented.

Printing: It must be printed out (no electronic submissions), but it may be double-sided.

**References**
