

Project Assignment: Critical Review

Proposal Due: in class 9/27/16

Paper Due: in class 11/22/16

Oral Presentations: TBA

Write a critical review on a subject area of interest to you and/or your research. The subject area must be related to the mechanical behavior of materials and should emphasize material *structure-property relationships*. In other words, it should include a material or type of material, a mechanical behavior, and perhaps even a mechanism. For example, “Creep of Aluminum Oxide by Grain Boundary Sliding,” “Modeling the Deformation of Powder Metal Compacts during Hot Isostatic Pressing,” or “Biomimetic Hydroxyapatite-Polymer Composites for Synthetic Bone Substitutes” would work well. Try not to choose too broad of a subject area. For example, “Plasticity in Steel” or “Polymer Viscoelasticity” are much too general.

“*Review*” means that the paper attempts to survey relevant literature on the subject matter from some point in the *historical* past up to the *present*. Literature citations should primarily include peer-reviewed journals articles, conference proceedings and books. Web citations are generally not appropriate. If you are not familiar with search engines such as *Google Scholar*, *Web of Science*, and *Medline* (see http://www.library.nd.edu/find_articles/index.shtml), please contact me.

“*Critical*” means that the paper includes original *evaluation* and *organization* of the subject matter. Think critically... What are the fundamental scientific and engineering issues? What’s the most important work that’s been done in this area and why? What are the merits or problems with specific contributions? How do different contributions compare/contrast? What problems persist in this area? What is needed to push knowledge further in this area? Again, above all else, emphasize material *structure-property relationships*!

The proposal should be one page or less, including a proposed title. A well-written proposal will summarize the aim of the entire paper. Obviously, this will require some foresight on your part. It is strongly recommended that you have already completed a significant portion of your literature search before writing the proposal. The proposal provides me a chance to offer feedback before its too late!

The final paper should be no longer than 20 pages including references, tables and figures. References should be cited in the text numerically [1], and listed at the end in a references section. Formatting guidelines are flexible given consistency and clarity.

The oral presentation will include a short summary of the paper (10-15 min) followed by discussion (5 min). Times and dates for presentations are TBA.