

Project Assignment: Critical Reviews  
Due Dates: see Class Calendar

Nine journal articles (or similar documents) will be assigned throughout the semester to be discussed and critically evaluated in small groups of three to five students. Critical evaluation will require that students in each group conduct their own research in order to understand important terminology, concepts and cited references. A critical review will then be written by one student in each group who will summarize the discussion, evaluation and research of the group. Each student will write two such reviews through the course of the semester. The critical review should be 1000-3000 words, not including references and figures, and follow formatting guidelines set forth by *Biomaterials*. (The only exception is to include figures and tables within the manuscript text rather than at the end.)

“*Review*” means that the paper reviews important content in the paper (or referenced by the paper or required to understand the paper), but does not simply restate it. “*Critical*” means that the paper includes original *evaluation* and *organization* of the subject matter. A sampling of thoughtful questions is included on the back of this page. Literature citations should primarily include peer-reviewed journals articles, conference proceedings and books, as well as relevant patents, FDA documents and ASTM standards. Web citations are generally not appropriate; however, appropriate use of web-based search engines will be essential. Search engines such as *Pubmed*, *Web of Science*, *Medline*, and *Google Scholar*, as well as other resources, will be introduced in class.

The critical reviews count for 40% of your final course grade. In order to maintain ample motivation for group members to contribute to each review, 20% of your total grade will be based on peer evaluation of each teammates contribution to the effort. Teammates should provide the writer of the critical review with documentation, written summaries and/or proofreading. The writer of the critical review will attach a separate, confidential sheet that includes an assessment of the help provided to them by each of their teammates using the following scale: 0 = no help, 1 = minimal usefulness, 2 = somewhat helpful, 3 = helpful, 4 = indispensable.

A sampling of thoughtful questions for your critical review. (This list is not intended to be exhaustive.)

### **Introduction/Background/References**

1. What is the clinical relevance?
2. Why is this device/material important (or potentially important) to clinical medicine?
3. What are other related or earlier devices/materials/studies that are key to understanding this device/material/study?
4. Were the cited references adequate?
5. What are the important performance requirements for the device?
6. What are the important material properties needed to achieve the device performance requirements?
7. How are these important material properties governed by the biomaterial structure?
8. What was the objective of this study? Or, what hypothesis was tested by the study?

### **Methods**

9. What were the experimental groups? measurements?
10. How were the methods designed to meet the study objective or test the study hypothesis?
11. Were the methods clearly explained?
12. Were the methods sound?
13. Did the methods meet their intended purpose?

### **Results/Discussion/Conclusions**

14. Were the results/conclusions supported and reasonable? Why or why not?
15. What in this study was a new or original contribution to the field of biomaterials science?
16. How do the results fit within our paradigm of processing-structure-property relationships (see questions 5-7, again)?
17. How did the results compare/contrast to other related studies/materials/devices?
18. What were notable strengths and weaknesses of this study?
19. What are the implications of the results/conclusions toward biomaterials science or clinical medicine?
20. Did the results of this study raise any new questions that need to be answered? What do the results of this study suggest as a good direction for future work?