**Biomaterials for cell and tissue engineering**

This take-home exam will evaluate the student’s knowledge of the influence of biomaterial properties on cellular behavior. A particular emphasis will be placed on 1) cell adhesion and differentiation responses and 2) controlling these responses for tissue engineering applications. The reading materials will provide the basis for the exam. Students will receive the exam via email at 8 am on the day of the exam (March 11th) and will have 24 hours to return their responses via email to Dr. Brown. Any responses received after the 24 hour deadline (8 am March 12th) will receive a Fail. Requests to take the exam must be received by 8 am on Thursday March 7th to be eligible to receive the exam. Students must work alone.

**Topics covered by this exam will include**:

* Influence of substrate mechanics on cell behavior (differentiation, proliferation, etc.).
* Influence of nanotopography on cell adhesion, spreading, and phenotype
* Integrin mediated adhesion, focal adhesions, and cytoskeleton components
* Extracellular matrix
* Biomaterial design for controlling cell responses
* Biomaterial design for tissue engineering
* Synthetic vs. natural materials for controlling cell responses