MECH483: Mechanics and Energy Conversion for Living Cells
Instructor: R. Bhiladvala  Units: 1.5  Hours: 3-0-1  Summer 2013

Course Objectives:
[1] To understand how macromolecular machines in living cells contribute to health & disease.
[2] To explore design of engineering systems inspired by mechanics and energy conversion processes in cells, refined by natural selection for over 3 billion years.
[3] To enable engineering career choices useful to healthcare & to biological research.
[4] Project Areas: Studies in cellular or molecular level of diagnosis or treatment; tissue engineering; targeted drug delivery; bio-inspired engineering.

Themes and Topics:
- Cell components and their functions.
- Families of molecules used by cells.
- Energy conversion and ordering processes.
- Proteins –the machine systems of cells.
- DNA –the cell’s Library and copy machines.
- Mech analyses of cytoskeleton, cell membrane.
- Cell movement and forces.
- Cell mechanotransduction.
- Tissue regeneration, stem cells for healing.
- Cancer
- Diagnostics/treatment at cell & molecule level.
- Bio-inspired engineering systems.
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**Web Info:**  
http://moodle.uvic.ca is the course info site for announcements, assignments, and course materials.

**Text:**  
Essential Cell Biology, 3rd Edition (Available through Campus Bookstore)

**Materials:**  
Class slides, papers, movies, on Moodle course site.

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