Basic Biophysics for Motion in Cells

PHYS 798N       CHPH 718N

Instructor:  Michael E. Fisher, Room 2100A, IPST Bldg. 85, 
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Time:     Tuesdays and Thursdays,  9:30 am to 11:00 am

Place:     Department of Physics: Room 4208

Home page:  Course Outline, Book Contents, Appendix

Home page:  http://www.physics.umd.edu/courses/Phys798N/index.html

Credit:     3 hours

Aims: The aim of the course is to give graduate students in the physical, 
          chemical, engineering and biochemical sciences an introduction to some 
          aspects of modern molecular biophysics, which draws on concepts and ideas from physics, 
          chemistry, engineering and, of course, biology. To this end the book by Jonathon Howard 
          (see below) will be used as the required course text although not all the topics treated in the 
          book will be covered. (The Contents of Howard=s book may be viewed on the home page for 
          the course.) Some appreciation for modern research on Amolecular motors or motor proteins, 
          which is being pursued at the single-molecule level, is an overall goal. The final assignment 
          will include a report on a paper from the recent and current literature.

Prerequisites: The course will be taught at an introductory graduate level, developing needed concepts 
              and assuming only some acquaintance with undergraduate mechanics, thermodynamics, statistical 
              mechanics, and calculus. No prior knowledge of biology 
              will be presupposed. Well prepared and motivated undergraduates may be admitted 
              with the instructor=s approval.

Texts: (a) Mechanics of Motor Proteins and the Cytoskeleton by Jonathon Howard 
       (b) Cell Movements: From molecules to motility by Dennis Bray, 2nd Edn., 
           Notice the significant advanced undergraduate text: - 
       (c) Biological Physics: Energy, Information, Life by Philip Nelson (University of 
       (d) Physical Biology of the Cell by Rob Phillips, Jane Kondev, and Julie Theriot 
           (Garland Science, Hamden, CT, 2008).

Also ON RESERVE (along with the other books mentioned) for background in 
cell biology the recommended (but not required) text is: -

(e) Essential Cell Biology by Bruce Alberts and coauthors 
    (Garland Publishing, Inc., New York, 1997);  but see also (bigger and heavier):
(f) Molecular Cell Biology by H. Lodish and coauthors, 3rd Edn. 
    (W.H. Freeman & Co., New York, 1995),
(g) Molecular Biology of the Cell by B. Alberts and coauthors, 3rd or later Edn. 
    (Garland Publishing, Inc., New York, 1994),