**SPRING 2008**

# 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: 4208

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

Credit: 3 hours

Aims and Content: The aim of the course is to give graduate students in the physical, and chemical, engineering and biochemical sciences an introduction to some Content: 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 Jonathan 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 "molecular motors" or motor proteins, which is being pursued at the single-molecule levels, is an overall goal. The final assignament 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** (Sinauer Associates, Inc., Sunderland, Mass., 2001). [**required**]

(b) **Cell Movements**: **From molecules to motility** by **Dennis Bray,** 2nd Edn., (Garland Publishing, 2001).

*Notice the significant advanced undergraduate text*: -

(c) **Biological Physics: Energy, Information, Life** by **Philip Nelson** (University of Pennsylvania) (W.H. Freeman & Co., New York, 2004).

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

(d) **Essential Cell Biology** by **Bruce Alberts** and **coauthors** (Garland Publishing, Inc., New York, 1997); but see **also** (bigger and heavier):

(e) **Molecular Cell Biology** by **H. Lodish** and **coauthors**, 3rd Edn. (W.H. Freeman & Co., New York, 1995),

(f) **Molecular Biology of the Cell** by **B. Alberts** and **coauthors**, 3rd or later Edn. (Garland Publishing, Inc., New York, 1994),

(g) **The Cell**: **A Molecular Approach** by **G.M. Cooper**, 2nd Edn. (Sinauer Associates, Inc., Sunderland, Mass., 2000).