

Spring 2009
Prof. Drake Mitchell

Physics 490/590

Cellular and Molecular Biophysics

Office – SB2, Room 51, 725-9876, drakem@pdx.edu

Office Hours: Tue. 11:00; Thur. 1:00

Class meets - MWF 11:30-12:35, Neuberger Hall Room 387

Required text: Biological Physics – Energy, Information, Life by Philip Nelson

<u>DATE</u>	<u>READING</u>	<u>TOPIC</u>
3/30		Intro 'exam', Ch. 1 – Life generates order, key ideas from chemistry
4/1	1 - 29	Ch. 1,2 – Cell physiology, biomolecules; <u>assign Ch1, Ch.2 homework</u>
4/3	37 - 62	Ch. 2 – Biomolecular devices, membranes
4/6	69 – 77	Ch. 3 – Distributions, ideal gas law; <u>Ch 1, Ch 2 homework due</u>
4/8	78 – 88	Ch. 3 – Ideal gas law, Boltzman distribution; <u>assign Ch. 3 homework</u>
4/10	89 - 101	Ch3. – Heredity; sample problems
4/13	109 - 126	Ch4. – Brownian motion; <u>Ch. 3 homework due</u>
4/15	127 - 134	Ch. 4 – Diffusion; <u>assign Ch 4 homework</u>
4/17	135 - 144	Ch. 4 – Biological applications of diffusion
4/20		Review of concepts in Ch. 1- 4; <u>Ch 4 homework due</u>
4/22		MIDTERM #1
4/24	158 - 164	Ch. 5 – Friction in fluids; return midterm
4/27	165 - 171	Ch. 5 – Reynolds number, friction in fluids
4/29	172 - 185	Ch. 5 – Biological applications, examples; <u>assign Ch. 5 homework</u>
5/1	199 - 209	Ch. 6 – Entropy & temperature
5/4	210 - 216	Ch. 6 – 2 nd Law, Open systems; <u>Ch. 5 homework due</u>
5/7	217 - 229	Ch. 6 – Microscopic systems; <u>assign Ch. 6 homework</u>
5/10	246 - 259	Ch. 7 – Entropic forces, osmotic pressure
5/11	260 - 272	Ch. 7 – Osmotic flow, cell electrostatics; <u>Ch. 6 homework due</u>
5/13	273 - 281	Ch. 7 – Special properties of water; <u>assign Ch. 7 homework</u>
5/15		Review of concepts in Ch. 5 – 7
5/18		MIDTERM #2; <u>Ch. 7 homework due</u>
5/20	294 - 307	Ch. 8 – Chemical potential - μ ; <u>selection of papers for presentation due</u>
5/22	308 - 320	Ch. 8 – Chemical reactions, dissociation
5/25		NO CLASS
5/27	321 - 332	Ch. 8 – Self-assembly; <u>assign Ch. 8 homework</u>
5/29		Student presentations of research papers
6/1		Student presentations of research papers; <u>Ch. 8 homework due</u>
6/3		Student presentations of research papers
6/5		Student presentations of research papers; Review for final

FINAL EXAM Thursday, 6/11/09, 12:30 – 14:20

Grading: Homework – 10% Midterm #1 - 20% Midterm #2 - 20%
Paper presentation/critique – 15% Final – 35%
All homework turned in on time; participation in class – 5% bonus