PHYSICS 204 - Physics for Computer Science II, Sections 1,2,3

Aims of the Course:
1. To understand the principles of Physics that can help you design Computer Software and Hardware.
2. To give you experience in thinking to solve problems. Engineers solve (real world) problems.

Lecture/Recitation: Tuesday & Thursday, 2:15–4:05 PM in Science Building Room C205
Dr. Larry Liebovitch: http://people.qc.cuny.edu/Faculty/Larry.Liebovitch/
Office Hours: Tuesdays/Thursdays 1:15 PM - 2:15 in SB B322

Textbook (REQUIRED):

Michael G. Raymer. The Silicon Web: Physics for the Internet Age. (Taylor & Francis, 2009).

Other Sources (not required):

Barabasi. Linked. (Perseus Publishing, 2002).
Hecht. College Physics, 11th Ed. (Schaum's Outlines, 2012)
Liebovitch & Shehadeh. Fractals&Statistics (DecoBytes, 2003)
https://drive.google.com/drive/u/0/folders/0B3t7HoVL1Ct7RTJucGxtVHJOeW8
Liebovitch. Fractals and Chaos: Simplified for the Life Sciences (Oxford University Press, 1998).
Mazzucato. The Entrepreneurial State: Debunking Public vs. Private Sector Myths (Anthem, 2013
Mermin. Quantum Computer Science. (Cambridge University Press, 2007).

My Lecture Videos and other materials will be posted at:
https://drive.google.com/drive/u/1/folders/0BxKjzHTZ7PXHcWpUdFBROEY3amM

Attendance in Lecture and Recitation is required and attendance will be taken

Grading Policy:

Recitation Problems: 20%
Done in class, no makeups
Exams: 20%
These will consist of problems similar to those in the Recitation Problems
Midterm: March 16, 2017: 10%
Final Exam: (TBA, May 19-26, 2017): 10%
Projects: 40%
TWO executable PROGRAMS illustrating physics from the course, each WITH a VIDEO
#1 program/video due 2:15 PM Thursday 3/23/2017 (late = 0 credit)
#2 program/video due 2:15 PM Thursday 5/18/2017 (late = 0 credit)
Topic must be approved, in advance, by the instructor
Each Program (any computer language): 10%
Each Video (MUST not be longer than 4 minutes): 10%
Lab: 20%
Lab reports graded by the lab instructor

Week	Tuesday	Topic	Chapter	Thursday	Topic	Chapter
1	1/31/17	Introduction - Networks	Barabasi: pp. 41-92	2/2/17	Recitation/Problems	
2	2/7/17	Heat & Thermodynamics	Raymer: pp. 112-129	2/9/17	Recitation/Problems	
3	2/14/17	Statistical Physics: Scaling Laws	Liebovitch&Shehedah: Lectures 21-30	2/16/17	Recitation/Problems	
4	2/21/17	Non-LinearDynamics (& chaos)	Liebovitch: pp. 115-241	2/23/17	Recitation/Problems	
5	2/28/17	Electricity & Magnetism & Special Relativity	Raymer: pp. 141-180	3/2/17	Recitation/Problems	
6	3/7/17	Electrical Circuits	Hecht: pp. 281-334	3/9/17	Recitation/Problems	
7	3/14/17	**REVIEW FOR MIDTERM EXAM**		**3/16/17**	**MIDTERM EXAM**	
8	3/21/17	Introduction to Quantum Mechanics	Raymer: pp. 299-313	**3/23/17**	Recitation/Problems **#1 Program/Video Due**	
9	3/28/17	Introduction to Quantum Computing	Mermin: pp. 1-35	3/30/17	Recitation/Problems	
10	4/4/17	Quantum Cryptography Private Key Encryption		4/6/17	Recitation/Problems	
11	4/11/17	**NO CLASS**	**Spring Recess**	4/13/17	**NO CLASS**	**Spring Recess**
12	4/18/17	**NO CLASS**	**Spring Recess**	4/20/17	**NO CLASS**	**Monday Schedule**
13	4/25/17	Fourier Transforms & Public Key Encryption	Mermin: 63-87	4/27/17	Recitation/Problems	
14	5/2/17	Quantum Mechanics: Atoms	Raymer: pp. 310-330	5/4/17	Recitation/Problems	
15	5/9/17	Quantum Mechanics: Materials	Raymer: pp. 337-367	5/11/17	Recitation/Problems	
16	5/16/17	**REVIEW for FINAL EXAM**		**5/18/17**	Review Problems for Final Exam **#2 Program/Video Due**	
	FINAL EXAM May 19-26, 2017					

Textbook (required):
Michael G. Raymer. The Silicon Web: Physics for the Internet Age. (Taylor & Francis, 2009).

Other Sources (not required):

Albert-Laszlo Barabasi. Linked. (Perseus Publishing, 2002).
Eugene Hecht. College Physics, 11th Ed. (Schaum's Outlines, 2012)
Larry S. Liebovitch and Lina A. Shehadeh. Fractals&Statistics. 2003.
https://drive.google.com/drive/u/0/folders/0B3t7HoVL1Ct7RTJucGxtVHJOeW8
Larry S. Liebovitch. Fractals and Chaos: Simplified for the Life Sciences (Oxford University Press, 1998).
Mariana Mazzucato. The Entrepreneurial State: Debunking Public vs. Private Sector Myths (Anthem, 2013).
N. David Mermin. Quantum Computer Science. (Cambridge University Press, 2007).