

Physics 10: Course Outline¹

Spring Quarter, 2008

Website: physics.ucsd.edu/~tmurphy/phys10/

- Week 1: (Mar. 31)
- Course introduction, structure, goals.
 - Science generalized, scope of physics, the human element.
 - Big picture; contents of Universe on the largest scales
- Week 2: (Apr. 7)
- Cosmology, the fate of the Universe, life and anthropic ideas
 - Particles: the actors on the stage of physics
 - Fundamental particles and forces; unification of forces
- Week 3: (Apr. 14)
- How things move: Newton's revolution—mass, inertia, linear motion
 - Velocity & acceleration; free-fall
 - Friction, net force, air resistance
- Week 4: (Apr. 21)
- Momentum, Energy, Power
 - Conservation of Energy and Momentum
 - Other conservations: angular momentum, mass, particle number, etc.
- Week 5: (Apr. 28)
- Energy in our lives: food, solar, gasoline, nuclear, etc.
 - **Midterm Exam:** May 2; 2:00 PM WLH 2005
- Week 6: (May. 5)
- Hollywood vs. Physics: is this the *real* world?
 - Gravity: orbits, rockets, and a rotating space station
 - Einstein messes with space and time to get Special Relativity
- Week 7: (May. 12)
- Einstein contorts spacetime to get General Relativity
 - Scientific scrutiny & skepticism applied to General Relativity
 - Electric charge, electric force & fields
- Week 8: (May. 19)
- Electromagnetic Induction; Electromagnetic radiation
 - Quantum Mechanics overview
 - The nature of light: particle or wave
- Week 9: (May 28) (May 26 is a holiday)
- Spectroscopic dissection of light
 - Natural light phenomena
- Week 10: (June 2)
- Nuclear force and how the sun shines
 - The frontiers of modern physics
 - The role of science in our lives

Final Exam: Friday, June 13, 3:00 PM; WLH 2005

Grading Scheme

- 25% on homework, roughly weekly schedule, due Fridays
- 10% based on bi-weekly submission of questions/observations (via WebCT). Half credit if turned in late, no later than a week late

¹The number of lectures per week is represented by the number of bullets in that week, though the daily content may include a mixture of topics listed in the given week.

- up to 15% based on classroom participation (taken out of midterm/final allotments)
- 30% based on midterm (15% if full classroom credit is used toward midterm)
- 35% based on final (20% if full classroom credit is used toward final). Final is weighted toward topics of second half, some fundamental concepts from earlier in quarter

Grades will be curved to fairly represent student capabilities

Required Textbook:

Conceptual Physics, 9th edition, by Paul G. Hewitt, Addison Wesley, San Francisco, 2001

Transmitter Required:

For class participation credit, purchase a transmitter from the bookstore. See class web page <http://physics.ucsd.edu/~tmurphy/phys10/phys10.html> for more details.

Class Meeting Times:

Lecture: Warren Lecture Hall (WLH) 2005, MWF 2:00–2:50 PM

Discussion: Warren Lecture Hall (WLH) 2111, W 4:00–5:50 PM (focus on concepts, mock quizzes)

Problem: Center Hall 212, Th 8:00-9:50 PM (focus on homework, exam study)

Professor Contact and Office Hours:

Professor: Tom Murphy

e-mail: tmurphy@physics.ucsd.edu

Phone: 858.534.1844

Office: SERF Building, Room 336 (building number 930)

Hours: Thursday 1:30–2:30 PM, or by appointment

Teaching Assistant Contact and Office Hours:

TA: Jim Wilson

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Office hr: Thursday, 2:30–4:00 PM; SERF Building, Room 434 (building number 930)