Physics 121.6 – 2007/2008

Lecture Schedule

Here, *approximately*, are the sections of the text book (**Physics for Scientists and Engineers** by Serway and Jewett, 7th Edition) that we will be covering in each lecture. Please note that this list will almost certainly change as the year progresses. Updates will be posted on the Physics 121.6 web site as changes are made. You will be expected to read the appropriate text book sections **before** each lecture. The lectures will not simply repeat the text book material, but we will, expand and clarify the textbook, make sure the most important concepts are understood, do examples, and illustrate and reinforce the concepts with concept quizzes, classroom discussion, demonstrations and simulations. The reading quizzes provide an incentive for you to keep up with the pre-lecture reading.

Term 1 - 2007

Lecture	Date	Topics
1	W Sept. 5	*Introduction to the course* 1. *Physics and Measurement* 1.1 Standards of length, mass and time
2	F Sept. 7	1.2 Matter and Model Building 1.3 Dimensional Analysis 1.4 Conversion of Units 1.5 Estimates and Order-of-Magnitude Calculations 1.6 Significant Figures
3	M Sept. 10	2. *Motion in One Dimension* 2.1 Position, Velocity and Speed 2.2 Instantaneous Velocity and Speed
4	W Sept 12	2.3 Analysis Models: The Particle Under Constant Velocity 2.4 Acceleration - *Derivatives* 2.5 Motion Diagrams 2.6 The Particle Under Constant Acceleration
5	F Sept. 14	2.7 Freely Falling Objects
6	M Sept. 17	3. *Vectors* 3.1 Coordinate Systems 3.2 Vector and Scalar Quantities 3.3 Some Properties of Vectors
7	W Sept. 19	3.4 Components of a Vector and Unit Vectors 4. *Motion in Two Dimensions* 4.1 The Position, Velocity and Acceleration Vectors
8	F Sept. 21	4.2 Two Dimensional Motion with Constant Acceleration 4.3 Projectile Motion
9	M Sept. 24	4.4 The Particle in Uniform Circular Motion
10	W Sept. 26	4.5 Tangential and Radial Acceleration 4.6 Relative Velocity and Relative Acceleration

Lecture	Date	Topics
11	F Sept. 28	5. *The Laws of motion* 5.1 The Concept of Force 5.2 Newton's First Law and Inertial Frames
12	M Oct. 1	5.3 Mass 5.4 Newton's Second Law 5.5 The Gravitational Force and Weight
13	W Oct. 3	5.6 Newton's third Law 5.7 Some Applications of Newton's Laws
14	F Oct. 5	5.8 Forces of Friction
	M Oct. 8	**Thanksgiving Day Holiday**
15	W Oct. 10	6. *Circular Motion and Other Applications of Newton's Laws* 6.1 Newton's Second Law for a Particle in Uniform Circular Motion 6.2 Nonuniform Circular Motion
16	F Oct. 12	6.3 Motion in Accelerated Frames 6.4 Motion in the Presence of Resistive Forces
17	M Oct. 15	7. *Energy of a System* 7.1 Systems and Environments 7.2 Work Done by a Constant Force
18	W Oct. 17	7.3 The Scalar Product of Two Vectors 7.4 Work Done by a Varying Force - *Integration*
19	F Oct. 19	7.5 Kinetic Energy and the Work-Kinetic Energy Theorem 7.6 The Potential Energy of a System
20	M Oct. 22	7.7 Conservative and Nonconservative Forces 7.8 Relationship Between Conservative Forces and Potential Energy
21	W Oct. 24	8. *Conservation of Energy* 8.1 The Nonisolated System: Conservation of Energy 8.2 The Isolated System
	W Oct. 24	**Mid-Term Test #1 7:00 p.m.**
22	F Oct. 26	8.3 Situations Involving Kinetic Friction 8.4 Changes in Mechanical Energy for Nonconservative Forces 8.5 Power
23	M Oct. 29	9. *Linear Momentum and Collisions* 9.1 Linear Momentum and Its Conservation 9.2 Impulse and Momentum 9.3 Collisions in One Dimension
24	W Oct. 31	9.3 Collisions in One Dimension (continued) 9.4 Two-Dimensional Collisions

Lecture	Date	Topics
25	F Nov. 2	9.5 Center of Mass (*no integrations*) 9.6 Motion of a System of Particles 9.7 Deformable Systems 9.8 Rocket Propulsion
26	M Nov. 5	10. *Rotation of a Rigid Object About a Fixed Axis* 10.1 Angular Position, Velocity, and Acceleration 10.2 Rotational Kinematics: The Rigid Object Under Constant Angular Acceleration 10.3 Angular and Translational Quantities
27	W Nov. 7	10.4 Rotational Kinetic Energy 10.5 Calculation of Moments of Inertia (*no integrations*) 10.6 Torque
28	F Nov. 9	10.7 The Rigid Object Under a Net Torque 10.8 Energy Considerations in Rotational Motion 10.9 Rolling Motion of a Rigid Object
	M Nov. 12	**University Closed – for Remembrance Day (Nov. 11)**
29	W Nov. 14	11. *Angular Momentum* 11.1 The Vector Product and Torque 11.2 Angular Momentum: The Nonisolated System
30	F Nov. 16	11.3 Angular Momentum of a Rotating Rigid Object 11.4 The Isolated System: Conservation of Angular Momentum 11.5 The Motion of Gyroscopes and Tops
31	M Nov. 19	12. *Static Equilibrium and Elasticity* 12.1 The Rigid Object in Equilibrium 12.2 More on the Center of Gravity
32	W Nov. 21	12.3 Examples of Rigid Objects in Static Equilibrium 13. *Universal Gravitation* 13.1 Newton's Law of Universal Gravitation
33	F Nov. 23	13.2 Free-Fall Acceleration and the Gravitational Force 13.3 Kepler's Laws and the Motion of Planets
34	M Nov. 26	13.4 The Gravitational Field 13.5 Gravitational Potential Energy
	Tu Nov. 27	**Mid-Term Test #2 7:00 p.m.**
35	W Nov. 28	13.6 Energy Considerations in Planetary and Satellite Motion 14. *Fluid Mechanics* 14.1 Pressure
36	F Nov. 30	14.2 Variation of Pressure with Depth 14.3 Pressure Measurements
37	M Dec. 3	14.4 Buoyant Forces and Archimedes's Principle 14.5 Fluid Dynamics
		Year-End Break

Term 2 - 2008

Lecture	Date	Topics
38	F Jan. 4	14.6 Bernoulli's Equation 14.7 Other Applications of Fluid Dynamics
39	M Jan. 7	14.7 Other Applications of Fluid Dynamics (Continued) 15. *Oscillatory Motion* 15.1 The Motion of an Object Attached to a Spring
40	W Jan. 9	15.2 Mathematical Representation of Simple Harmonic Motion
41	F Jan. 11	15.3 Energy of the Simple Harmonic Oscillator 15.4 Comparing Simple Harmonic Motion with Uniform Circular Motion
42	M Jan. 14	15.5 The Pendulum 15.6 Damped Oscillations (*descriptive only*) 15.7 Forced Oscillations (*descriptive only*)
43	W Jan. 16	16. *Wave Motion* 16.1 Propagation of a Disturbance 16.2 The Traveling Wave Model
44	F Jan. 18	16.3 The Speed of Waves on Strings 16.4 Reflection and Transmission 16.5 Rate of Energy Transfer by Sinusoidal Waves on Strings
45	M Jan. 21	16.6 The Linear Wave Equation 17. *Sound Waves* 17.1 Speed of Sound Waves 17.2 Periodic Sound Waves
46	W Jan. 23	17.3 Intensity of Periodic Sound Waves
47	F Jan. 25	17.4 The Doppler Effect 17.5 Digital Sound Recording 17.6 Motion Picture Sound
48	M Jan. 28	18. *Superposition and Standing Waves* 18.1 Superposition and Interference 18.2 Standing Waves
49	W Jan. 30	18.3 Standing Waves in a String Fixed at Both Ends 18.4 Resonance 18.5 Standing Waves in Air Columns
	Th Jan. 31	**Mid-Term Test #3 7:00 p.m.**
50	F Feb. 1	18.6 Standing Waves in Rods and Membranes 18.7 Beats: Interference in Time 18.8 Nonsinusoidal Wave Patterns
51	M Feb. 4	35. *The Nature of Light and the Laws of Geometrical Optics* 35.1 The Nature of Light 35.2 Measurements of the Speed of Light 35.3 The Ray Approximation in Geometrical Optics 35.4 The Wave Under Reflection

Lecture	Date	Topics
52	W Feb. 6	35.5 The Wave Under Refraction 35.6 Huygens's Principle 35.7 Dispersion 35.8 Total Internal Reflection
53	F Feb. 8	36. *Image Formation* 36.1 Images Formed by Flat Mirrors 36.2 Images Formed by Spherical Mirrors
54	M Feb. 11	36.3 Images Formed by Refraction 36.4 Thin Lenses 36.5 Lens Aberrations
55	W Feb. 13	36.6 The Camera (*descriptive*) 36.7 The Eye 36.8 The Simple Magnifier
56	F Feb. 15	36.9 The Compound Microscope 36.10 The Telescope 37. *Interference of Light Waves* 37.1 Conditions for Interference
	F Feb. 15	Last day for withdrawing without academic penalty
	Feb. 18-23	**Mid-Term Break**
57	M Feb. 25	37.2 Young's Double-Slit Experiment 37.3 Light Waves in Interference 37.4 Intensity Distribution of the Double Slit Interference Pattern (*descriptive*)
58	W Feb. 27	37.5 Change of Phase Due to Reflection 37.6 Interference of Thin Films 38. *Diffraction Patterns and Polarization* 38.1 Introduction to Diffraction Patterns 38.2 Diffraction Patterns from Narrow Slits (*descriptive*) 38.4 The Diffraction Grating
59	F Feb. 29	23. *Electric Fields* 23.1 Properties of Electric Charges 23.2 Charging Objects by Induction 23.3 Coulomb's Law
60	M Mar. 3	23.4 The Electric Field 23.5 Electric Field of a Continuous Charge Distribution (*descriptive*)
61	W Mar. 5	23.6 Electric Field Lines 23.7 Motion of a Charged Particle in a Uniform Electric Field 24. *Gauss's Law* (*descriptive*)
62	F Mar. 7	25. *Electric Potential* 25.1 Electric Potential and Potential Difference 25.2 Potential Differences in a Uniform Electric Field

Lecture	Date	Topics
63	M Mar. 10	25.3 Electric Potential and Potential Energy due to Point Charges 25.4 Obtaining the Value of the Electric Field from the Electric Potential 25.5 Electric Potential Due to Continuous Charge Distributions (*descriptive*) 25.6 Electric Potential Due to a Charged Conductor
64	W Mar. 12	25.7 The Millikan Oil-Drop Experiment 25.8 Applications of Electrostatics
	W Mar. 12	**Mid-Term Test #4 7:00 p.m.**
65	F Mar. 14	27. *Current and Resistance* 27.1 Electric Current 27.2 Resistance
66	M Mar. 17	27.4 Resistance and temperature 27.5 Superconductors 27.6 Electrical Power
67	W Mar. 19	28. *Direct Current Circuits* 28.1 Electromotive Force 28.2 Resistors in Series and Parallel
	F Mar. 21	**Good Friday**
68	M Mar. 24	28.3 Kirchhoff's Rules
69	W Mar. 26	33.1 AC Sources 33.2 Resistors in an AC Circuit 28.5 Electrical Meters 28.6 Household Wiring and Electrical Safety
70	F Mar. 28	29. *Magnetic Fields* 29.1 Magnetic Fields and Forces
71	M Mar. 31	29.2 Motion of a Charged Particle in a Uniform Magnetic Field 29.3 Applications Involving Charged Particles Moving in a Magnetic Field
72	W Apr. 2	29.4 Magnetic Force Acting on a Current-Carrying Conductor 29.5 Torque on a Current Loop in a Uniform Magnetic Field
73	F Apr. 4	29.6 The Hall Effect
74	M Apr. 7	30. *Sources of the Magnetic Field* (*descriptive*)
	April 2008	**Final Examination** (Tuesday, April 15, 2008, 9:00 am)