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Conceptual Physics (PHYS 100) Fall 2008

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Course Description

Prerequisite: ENGL080 and MATH074.

Topics include scientific method, Newton's laws, motion, energy, momentum, rotational motion, gravitation, fluids, heat, electrostatics, DC circuits, sound, light and properties of waves. Laboratory utilizes computers for data acquisition and analysis. **Meets the general education requirement for science.**

Course Focus

This single-semester conceptual physics course provides an introduction to many topics in physics and general science for non-science majors, education and med-tech programs.

Text, References and Materials

Bring the required materials to all class meetings.

- Required: Conceptual Physics, 10th ed by Hewitt (ISBN 0-8053-9375-7)
- Required: Practicing Physics, 10th ed by Hewitt (ISBN 0-8053-9198-3); may be packaged with text.
- Required: Lab Notebook
- Required: Course Pack: Conceptual Physics Lecture Notes & Laboratories (Bookstore)
- Required: Calculator
- Optional: USB Drive (1 person from each lab group)

Course Schedule

Room: A-152

| | | |
|---------------|--------------------|-------------------|
| Lecture: | Tuesday & Thursday | 11:00 AM-12:15 PM |
| Laboratory: | Tuesday | 2:00-4:45 PM |
| Office Hours: | Monday | 11:00 AM-12:00 PM |
| | Wednesday | 2:00-3:00 PM |
| | Thursday | 4:00-5:00 PM |

Other office hours are available. Also see the attached schedule for more detail.

Course Evaluation

Letter grades will be determined as follows.

| | |
|----------|---|
| 90%-100% | A |
| 80%-89% | B |
| 70%-79% | C |
| 60%-69% | D |
| < 60% | F |

| | | |
|----------|--|----------------------|
| Lecture: | | 75% |
| | Exams (Equally Weighted) | 75% |
| | Quizzes | (+3%) |
| Lab: | | 25% |
| | Each Lab | 100 pts toward total |
| | Notebook | 100 pts toward total |
| | Penalty for misuse or absence of Notebook | -3 to -10 points |

Students must have passing averages in both the exams and laboratories to pass the course.

For example, if a student earns a 77.0% exam average, an 62.0% quiz average, and an 88.0% lab average, the student's grade would be (excluding extra credit):

| | |
|---------------------|-------|
| $0.770 \times 75 =$ | 57.75 |
| $0.620 \times 3 =$ | 1.86 |
| $0.880 \times 25 =$ | 22.00 |
| Total = | 81.61 |

 B

Attendance & Lateness

Lecture: Students are expected to be at all lecture meetings with all class materials. Unscheduled activities that count as labs or quizzes may also occur on lecture days. In general, missed classes are difficult to recover from and will greatly affect a student's ability to succeed (i.e. missing a class puts you in a BIG HOLE!).

Lab: Students may miss one lab for a valid, documented excuse (medical, family emergency, flood, famine, nuclear holocaust, plague of locusts, asteroid collision, etc.). Missing or not submitting more than 1 lab will result in a failing lab grade. If all labs are completed for a grade, the lowest lab grade will be dropped. Points will be deducted for lateness in lab.

Late Work:

Lecture: WebCT quizzes cannot be taken after the due date since the answers are discussed at the next class meeting.

Lab: Lab reports are due at the beginning of the next lab meeting unless otherwise specified. Late labs will be penalized one half grade after the start of class on the same day they are due, and one grade thereafter. Labs will not be accepted after one week from the original due date.

Quizzes

Quiz questions will be asked online via WebCT. In class, a deadline will be discussed by which the instructor must post a quiz if it is due at the next class meeting. Quizzes are due on the due date with no exceptions.

Extra Credit

The conceptual quizzes given online will be totaled and can add up to 3% to the course average.

Exam Makeups

Exams may only be made up if the student contacts the professor with a valid, documented excuse (see above) by phone, written note, or Email. The professor reserves the right to give a different exam that may be more difficult, or to adjust the grading scale to account for the fact the student is taking the exam under different testing conditions.

Lab Makeups

If students need to miss laboratory for a valid, documented excuse (see above), the instructor must be notified before the scheduled class or immediately after as above. If this is done, a makeup may be possible. Missing or not submitting more than 1 lab will result in a failing lab

grade. Students may miss one lab for a valid, documented excuse. If all labs are turned in, then the lowest lab grade will be dropped.

Academic Honesty

Students are expected to uphold the integrity of the academic process. In addition to personal acts of plagiarism or dishonesty, students are also obligated to report any act of cheating that they witness. Acts of dishonesty will result in disciplinary action as outlined in the Student Handbook. In essence, this means you will receive a "0" for the assignment OR an "F" in the course if the assignment is central to the course. A report will also be made to the Dean of Students. Two such infractions will result in dismissal from the college.

In this course, every person does his or her own work. You may discuss and work on the laboratories together, but the report must be your own work. Blatant copying will result in a "0" for the lab that cannot be dropped. In general, this applies to any assignment that is collected for a grade. Cheating on an exam will result in a failing grade for the course.

Academic Advising

Many students self-advise and pick their own courses, while others seek the advice of registration staff. For one reason or another, we sometimes learn (too late) that students have unrealistic or ill-advised schedules. Please feel free to ask my advice or the advice of your other professors in such matters.

Class Conduct

1. Don't be late. It's rude and it interrupts the class. If you miss a prelab discussion, points will be deducted.
2. Turn cell phones off!
3. Do not talk, sharpen pencils, staple or do anything else at times when it might be a distraction to your classmates.
4. I value your input, I want to have discussions, and I must hear your questions. However, you must raise your hand. Sometimes, I wish to let the class think, and you will ruin that if you call out the answer.

The PHYS 100 Survival Guide: How to do well in a science course

1. Do all homework on time because
 - a. If you let it pile up, you will find it very difficult to do well on the exams.
 - b. Studying for a test involves doing the homework *again*, not the first time.
 - c. Review time is review. It is driven by your questions.
2. About exams:
 - a. The exam is taken from the homework and class activities.
 - b. Understanding examples and demonstrations from class is key to doing well.
 - c. Do not forget to check the objectives to be sure you've covered all the bases!
3. Studying in groups can be helpful!
4. Do not understudy for the first exam.
5. Do not wait until the day that a lab is due to complete it because:
 - a. As time goes on, you will forget what was done in lab. Do it while it's still fresh in your mind.
 - b. If you have questions (and you will), then you will not be able to get them answered in time and will have to turn the lab in late. This results in a deduction of 5 to 10 points.
 - c. If you just decide to hand it in with a major mistake, then you will get it back to do again. Your grade *starts* at an 85 on the second try, and the second time is more difficult (see "a").
6. Keep a careful lab notebook. It is worth a lab grade.
7. Do not plagiarize or copy. It is dishonest and speaks to your character.
8. Have some fun and enjoy the course. This may be your only opportunity to take a lab science, so enjoy it and take away all that you can from this experience.

Course Goals

Students will

1. develop an appreciation for physics and an understanding of what it can tell us about the world. Students should see how physics can explain various phenomena that they encounter every day.
2. gain practice in experimentation, data recording and data analysis.
3. use a computer for data acquisition and analysis.
4. describe the scientific method of investigation and use it to evaluate theories and ideas that are encountered in everyday life.
5. conceptually understand basic concepts of
 - a. Newton's Laws
 - b. One dimensional motion and freefall
 - c. momentum
 - d. energy
 - e. rotational motion
 - f. gravitation
 - g. atomic structure
 - h. fluids
 - i. heat
 - j. electrostatics and DC circuits
 - k. sound, light and properties of waves

Performance Objectives

Unless otherwise indicated, mastery of the following performance objectives is achieved by accurately defining and describing the specified concept, and applying this concept to assigned questions. Exams will consist of multiple choice questions, short answer questions, and calculations where appropriate.

Laboratory:

1. In groups, students will pre-read, set up and perform experiments.
2. The student will keep a proper laboratory notebook using the format provided.
3. The students will perform calculations and answer questions using the data that was collected.
4. In groups, students will set up experiments in which the computer records data from various sensors.
5. Students will use the computer to perform curve fits to obtain the slope of a line.

Chapter 1: About Science

6. The student will describe the role that mathematics plays in science.
7. The student will state the four (or five) steps of the scientific method and be able to recognize a non-scientific hypothesis. (R 10, E 2, 4, 9)
8. The student will differentiate between science and technology. (R 19)
9. The student will differentiate science from religion with respect to their areas of applicability. (R 17, 18)

Chapter 2: Newton's First Law of Motion- Inertia

10. The student will describe what was demonstrated by Galileo at the Leaning Tower of Pisa. (R 5; E 3)
11. The student will describe Galileo's experiments with inclined planes and state Galileo's conclusion. (R 6; E 1, 2, 4)
12. The student will define "inertia," state Newton's First Law, and answer questions demonstrating your understanding of their meaning. (R 7, 8, 9; E 5, 6, 7, 10, 11, 12*, 13, 15, 19)
13. The student will define the terms "force" and "net force," give the English and metric units, and calculate net forces in simple situations. (R 10, 11, 12; E 20, 30, 41, 43, 44, 45/46/47/48 !!!)
14. The student will state the condition for equilibrium and use it to find the missing forces in diagram. (R 13, 14, 15, 16, 17, 18; E 21, 22, 24*, 25, 26, 27, 28, 29)
15. The student will define "normal force." (E 34, 35*)
16. The student will define "tension."

Chapter 3: Linear Motion

17. The student will define and differentiate instantaneous speed, average speed and velocity. (R 2, 3, 4, 5, 6, 7, 8, 9; E 4, 11, 15)
18. The student will calculate average speeds and distances covered for constant speed/velocity situations from given information. (O 1, 2, 3, 4, 5, 6*, 7, 8, 9; P 1)
19. The student will define acceleration. (R 10, 11, 12, 13!; E 5, 6*, 10, 13, 18, 19*,)
20. The student will calculate the accelerations, final velocities and distances from given information. (O 10, 11, 12, 13, 14, 15; P 2, 6, 7**)
21. The student will find velocities and calculate distances in simple free fall problems. (O 16, 17, 18, 19, 20, 21, 22; E 27!, 28, 29, 32, 36; P 3, 4!, 5*, 10*)

Chapter 4: Newton's Second Law of Motion

22. The student will define friction and describe its effects (R 2, 3, 5, 6, 7, 8, 9; E 7)
23. The student will differentiate mass from weight, give the English and metric units for each. (R 10, 11, 12, 13, 14, 16, 17, 18, 19; E 12, 13, 15)
24. The student will calculate weights from given information (O 1, 2, 3, 4, 5)
25. The student will state Newton's second law and describe the relationship between force, mass and acceleration. (R 20, 21, 22, 23, 24, 25, 26; E 5, 27**,)
26. The student will calculate forces, masses or accelerations using Newton's second law (O 6, 7, 8, 9, 10*)
27. The student will define "free-fall" and state the free-fall acceleration. (R 27, 28, 29; E 28, 34)
28. The student will describe the factors that determine acceleration when air resistance is present and define "terminal speed." (R 30, 31, 32, 33, 35; E 42, 45, 49, 56, 57)

Chapter 5: Newton's Third Law of Motion

29. The student will state Newton's laws and be able to identify action/reaction force in a given system. (R 2, 3, 4, 5, 6, 7, 10, 11, 12; E 1, 3, 4, 5, 7, 10, 11, 12, 13, 15, 22, 23, 24)

Chapter 6: Momentum

30. The student will define momentum and impulse and state the relationship between them. (R 1, 3, 4, 7, 12, 13; E 1, 3, 6, 8, 10, 12, 13, 14, 15, 19, 20)
31. The student will state the law of conservation of momentum and explain how it applies to a given situation (R: 14, 17, 18, 19/20; E 28, 30, 33, 35, 36, 39, 41, 48, 49, 53*, 56, 58)

Chapter 7: Energy

32. The student will define work and name its SI unit. (R 2, 3, 4, E 3*, 4, 5, 25, 26, 27)
33. The student will calculate the work done from the force and distance. (O 1, 2, 3; E 4, 6, 11, 17)
34. The student will define Power and name its SI unit. (E 7)
35. The student will calculate the power expended from the work and time. (O 4, 5, 6)
36. The student will define potential energy and calculate it in a given situation. (R 7, 8; O 7, 8)
37. The student will define kinetic energy, and calculate it in a given situation. (R 10; O 10, 11) 12;

- E 49*)
38. The student will state the work-energy theorem and use to find one from the other. (R 11, 12*, O 13, 14; E 1, 2*, 23)
 39. The student will state the law of conservation of energy and use it to relate changes in potential and kinetic energy to one another (R 14, 15; E 19, 29/30, 31, 32/33, 34, 45)
 40. Students will compare and contrast kinetic energy and momentum as discussed in class. (R 23, 24, 25; E 50, 52, 54, 55, 58)

Chapter 8: Rotational Motion

41. The student will define and differentiate angular and tangential speed, and describe the relationship between them. (R 1, 2, 3, 4; E 1, 3, 4, 6)
42. The student will define rotational inertia and describe the factors that affect it. (R 7, 8, 9, 10, 12; E 12!*, 13, 14, 15*)
43. The student will define torque and describe the factors that affect it. (R 13, 14, 15; E 19)
44. The student will calculate the torque in a given situation. (O 1, 3)
45. The student will define center of mass and center of gravity and describe the properties of each as discussed in class, including stability. (R 16, 17; E 24, 25, 26, 32, 35, 37, 38!*)
46. The student will define centripetal force and differentiate it from centrifugal force. (R 23, 24, 25/26, 60)
47. The student will define angular momentum and describe the factors that affect it. (R 30)
48. The student will give examples of situations that demonstrate conservation of angular momentum. (R 31; E 10, 53, 54, 59)

Chapter 9: Gravity

49. The student will define gravitational force and explain the factors that affect it in terms of Newton's law of universal gravitation. (R 3, 4, 5, 6, 7, 8, 9, 12 E 2, 4/5, 6, 7, 11, 13, 14!, 16, 18!, 19, 22)
50. The student will describe the cause of apparent weightlessness. (R 13, 14, 15; E 10, 24*, 25, 26,)
51. The student will explain the cause of ocean tides on the Earth. (R 17, 18, 19, 20; E 35, 37, 38, 41, 43*)
52. The student will define gravitational field. (R 26)
53. The student will describe Einstein's view of gravitation. (R 30, lecture and reading)
54. The student will define the term black hole and describe its properties (R 31, 32, 33, 59)
55. The student will define what is meant by dark matter and dark energy. (lecture and reading)

Chapter 11: The Atomic Nature of Matter

56. The student will describe the structure of the atom and describe the three particles that atoms are made of in terms of relative mass and charge. (R 9, 10, 11; E 39, 42)
57. The student will define "ion" and explain how positive and negative ions are formed. (E 27, 28, 29)

58. The student will define element and explain how elements heavier than hydrogen were formed (R 12, 14, 15, 16; E 1, 7, 8, 9, 10, 16)
59. Name and define the three things given for each entry in the simple periodic table in the text. (R 18; E 15*, 23, 24, 25)
60. The student will define isotope and distinguish between atomic mass and atomic mass number. (R 20, 21; E 18, 19)
61. The student will define and differentiate compound and mixture. (R 22, 23)
62. The student will define molecule. (R 24; E 3)
63. The student will define antimatter and its relationship to ordinary matter. (R 26, 27; R 49)
64. The student will define dark matter and explain the evidence for its existence. (R 28)

(Optional) Chapter 12: Solids

65. The student will describe the structure of crystalline solids as opposed to amorphous solids.
66. The student will describe the properties of metals that allow them to conduct electricity.

Chapter 13: Liquids

67. The student will define the term pressure and describe the factors that affect it. (R 2; E 2, 4, 5, 6)
68. The student will describe the factors that affect the pressure at a point inside a liquid. (R 3, 4, 5; E 10, 11, 12, 13, 17, 56)
69. The student will define buoyancy, state Archimedes' principle, and describe what factor makes an object sink or float (R 7, 8, 9, 14, 15, 16, 17, 18; E 28, 30, 32, 34*!, 35, 36, 47)
70. The student will state Pascal's principle and explain how hydraulics work (R 21; E 18!, 56, 57, 58)

Chapter 14: Gases and Plasmas

71. The student will explain the causes of atmospheric pressure. (R 1, 3, 4; E 1, 2, 6, 8)
72. The student will explain why "suction" is a myth. (R 10, 15; E 21, 26)
73. The student will explain how a barometer works. (R 7, 8, 9, 11, 12, E 19*)
74. The student will describe the relationship between pressure and volume using Boyle's law. (R 13, 14; E 5, 9, 11, 34, 35)
75. The student will apply buoyancy concepts to the atmosphere. (R 17, 18; E 27, 28, 29*, 31, 47)
76. The student will state Bernoulli's principle and give examples of situations or phenomena that are explained by it (R 19, 20, 22, 23, 24; E 44, 48, 53, 55, 58)
77. The student will define the plasma state of matter. (R 25, 27)

Chapter 15: Temperature, Heat and Expansion

78. The student will define and differentiate temperature and heat using energy principles. (R 7, 8, 9; E 5)

79. The student will relate and differentiate the Fahrenheit, Celsius and Kelvin temperature scales and give the values of some reference temperatures on each. (R 2; E 2)
80. The student will describe methods of temperature measurement as discussed in class. (E 8)
81. The student will define and differentiate the various forms of molecular and internal energy. (R 4; E 6, 7*, 11*)
82. The student will define “calorie.” (R 12, 13)
83. The student will define specific heat capacity and explain its meaning with respects to heat transfer between substances. (R 15, 16, 17, 18, 20; E 15, 18, 21, 22, 23, 27!)
84. The student will describe thermal expansion and explain its molecular origin. (R 21, 23; E 32, 34, 40, 42!, 43, 45, 46*, 50!)
85. Student will explain how a bimetallic strip works. (R 22)
86. Students will describe the anomalous expansion water. (R 25, 29*, 30; E 56, 58, 59)

Chapter 16: Heat Transfer

87. The student will describe conduction in solids and define conductor and insulator. (R 3, 4, 5, 6; E 1, 3, 4, 6, 9, 11, 15, 20)
88. The student will explain the cause of convection and give examples. (R 7, 8, 10, 11, 13; E 10, 29, 31*, 37, 58)
89. The student will describe heat transfer by radiation. (R 14, 15; E 42, 44, 45, 47)
90. The student will describe the factors that affect the emission, absorption and reflection of radiation. (R 16, 19, 20, 21, 22, 24, 25)
91. The student will describe the meteorological process known as “radiation cooling.” (E 51, See lecture)
92. The student will explain the causes of the greenhouse effect in terms of the radiative properties of the Earth and atmosphere. (R 30, 31, See lecture)

Chapter 17: Change of Phase

93. The student will define evaporation, explain how it acts as a cooling process and give examples. (R 2, 3, 4, 5, 18; E 1, 2, 4, 9, 10, 11, 12)
94. The student will define and describe the process of condensation. (R 6, 7, 8; E 17, 18, 19, 21)
95. The student will define the meteorological terms relative humidity and dew point. (R 9; See lecture)
96. The student will define melting and freezing. (R 21, 22, 23)
97. The student will describe the energy changes that occur during a phase change utilizing a diagram of temperature verses time for water that is being heated. (R 26, 27, 29; E 23, 24, 25, 33!*, 40, 43, 48, 49)
98. The student will describe the operating principle of refrigerators and air conditioners (heat pumps). (R 28; E 52, 53, 59)
99. The student will define the latent heat of fusion and latent heat of vaporization. (See lecture and text)
100. The student will explain how the latent heat of vaporization fuels a hurricane. (See lecture)

Chapter 22: Electrostatics

101. The student will explain what is meant by the statement that charge is quantized and conserved. (R 7, 8)
102. The student will explain origin of charge in terms of the subatomic particles that carry it. (R 2, 3, 4, 5; E 3, 15, 19, 20)
103. The student will describe the nature of electrical force in terms of like and unlike charges. (E 5, 7, 12, 19, 23)
104. The student will describe the electric force in terms of Coulomb's law. (E 25, 27)
105. The student will describe the properties of conductors. (R 12; E 40, 50, 54, 59)
106. The student will differentiate conductors from insulators, semiconductors and superconductors. (R 13, 14; E 33, 34)
107. The student will explain how objects can be charged by contact and induction, and explain the concept of a "ground." (R 22, 23; E 10, 14, 18, 37, 39, 43)
108. The student will explain the concept of an electric field as discussed in class. (R 24, 26; E 31, 35!, 45*, 46*, 48!)
109. The student will explain how electric fields can be shielded. (R 27, 29, 34, 44)
110. The student will define and give the units of electric potential. (R 30; See lecture)

Chapter 23: Electric Current

111. The student will define the terms current, voltage and resistance and state the relationship between them. (R 2, 3, 4, 5, 6, 8!, 9, 10, 11, 12; E 1, 5, 7, 10, 15, 16, 19, 21, 22, 23, 24, 25.)
112. The student will calculate the current in a circuit from the voltage and resistance. (O 1, 2, 3, 4)
113. The student will describe the difference between direct and alternating current. (R 17, 18, 19)
114. The student will calculate the power in a circuit. (O 5, 6; E 29, 59)
115. The student will define and differentiate series and parallel circuits. (R 33, 34, 35, 36, 37, 38; E 2/3, 28, 31, 32, 33, 34, 43!, 44!, 45!, 46, 47, 52, 53)
116. The student will describe what is meant by "overloading" a circuit and explain the purpose of fuses or circuit breakers. (R 39, 40)

Chapter 19: Vibrations and Waves

117. The student will describe waves by differentiating transverse from longitudinal waves; defining wavelength, period, and frequency; and describing the relationships between them. (R 6, 7, 8, 9, 10, 11, 12, 13, 14; E 8, 9, 10, 11, 14, 18, 19, 20, 21, 22, 23!, 27, 31)
118. The student will solve simple numerical problems that relate frequency, period, wavelength and wave speed. (P 1, 2, 3, 4, 7)
119. The student will define constructive and destructive interference and state the principle of superposition. (R 15, 16, 17)
120. The student will describe standing waves and define node and antinode. (R 18, 19; E 33, 32)
121. The student will explain the origin of the Doppler Effect. (R 20, 21, 22; E 34, 35, 37, 39, 40)

Chapter 20: Sound

- 122. Define sound and describe sound waves with respect to speed and pitch (frequency), compressions and rarefactions, and the speed of sound in different media. (R 2, 3, 4, 5, 7, 8, 9, 10, 11; E 2, 6, 8, 10, 17, 19!, 22*, 24)
- 123. The student will compare the speeds of sound and light (E 9*, 11, 29)
- 124. The student will describe the facts that affect sound energy absorption (R 18; E 35)
- 125. The student will define reflection and refraction and give examples of each. (R 14, 15; E 15, 23)
- 126. Describe the phenomenon of resonance and give examples. (R 21, 23; E 33, 37, 38)
- 127. Explain the origin of beats and find the beat frequency in a given situation. (R 26, 27, 28; E 44, 46, 48, 49!, 50)

Chapter 21: Musical Sounds

- 128. *Review for Objective 122: Frequency and Pitch* (R 3; E 2, 7)
- 129. The student will students will differentiate intensity from sound level. (R 5, 6, 7)
- 130. The student will define the terms fundamental frequency and harmonic and describe the factors that determine the fundamental frequency of a string.. (R 9, 10, 11, 12; E 11, 14, 16, 17, 24)

Chapter 26: Properties of Light

- 131. The student will students will describe the electromagnetic spectrum. Students will describe electromagnetic radiation, and rank the types of radiation with respect to frequency, wavelength, and energy. (R 7, 9, 11, 13; E 4, 7, 10, 12!, 14, 19, 21, 22)

Chapter 27: Color

- 132. The student will students will use scattering to explain why the sky is blue, why the sunset is red, why the ocean is blue, and why clouds are white. (R 20, 21, 22, 23, 25, 26; E 35, 41)

Chapter 28: Reflection and Refraction

- 133. The student will state the law of reflection. (R 5; E 3)
- 134. The student will define refraction, explain its cause, and predict whether a light wave will bend toward or away from the normal line in a given situation. (E 23, 29*!)
- 135. The student will use refraction to explain the origin of a mirage. (R 13; E 34)
- 136. The student will define dispersion and explain the origin of a rainbow. (See lecture)
- 137. The student will explain the origin of total internal reflection. (R 22, 24)

Chapter 29: Light Waves

- 138. The student will state Huygen's Principle. (R 1)

139. The student will define diffraction and describe how it depends on wavelength and slit width. (R 3, 4, 5; E 2, 3, 6)
140. The student will define the term “polarization” and explain how light can be absorbed by crossed polarizers. (R 16, 18, 19, 20; E 35, 36, 39, 41)

Time Allowing

Chapter 30: Light Emission

OR Special Topic (e.g. MRI)

Tentative Schedule (Phys 100)

The instructor reserves the right to change the topics that are covered or their order.

| Week | Date | Chapters / Labs / Exams | Topics |
|------|---------|-------------------------|---|
| 1 | T 9/2 | Chapter 1 | Introduction, "About Science" |
| | | Lab | Hypothesis Testing |
| 1 | R 9/4 | Chapter 1 | About Science |
| | | | |
| 2 | T 9/9 | Chapter 2 | Newton's First Law |
| | | Lab | Measurement & Uncertainty |
| 2 | R 9/11 | Chapter 3 | Linear Motion |
| | | | |
| 3 | T 9/16 | Chapter 4 | Newton's Second Law |
| | | Lab | Motion |
| 3 | R 9/18 | Chapter 5 | Newton's Third Law |
| | | | |
| 4 | T 9/23 | | Review |
| | | Lab | Atwood's Machine |
| 4 | R 9/25 | Chapter 1-5 | Exam: Newton's Laws and Motion |
| | | | |
| 5 | T 9/30 | Chapter 6 | Momentum |
| | | Lab | Vectors |
| 5 | R 10/2 | Chapter 7 | Energy |
| | | | |
| 6 | T 10/7 | Chapter 7 | Energy |
| | | Lab | Simple Machines |
| 6 | R 10/9 | Chapter 8 | Rotational Motion |
| | | | |
| 7 | T 10/14 | Chapter 8 | Rotational Motion |
| | | Lab | Measurement |
| 7 | R 10/16 | Chapter 9 | Gravity |
| | | | |
| 8 | T 10/21 | | Review |
| | | <i>Lab ???</i> | <i>Units and SF???</i> |
| 8 | R 10/23 | Chapters 6-9 | Exam: Momentum, Energy, Rotational Motion and Gravity |
| | | | |
| 9 | T 10/28 | Chapter 11 | The Atomic Nature of Matter |
| | | Lab | Atomic Structure: Energy Levels and Spectra |

| | | | |
|----|---------|---|---|
| 9 | R 10/30 | Chapter 13 | Liquids |
| | | | |
| 10 | T 11/4 | Chapter 14 | Gases and Plasmas |
| | | Lab | Buoyancy |
| 10 | R 11/6 | Chapter 15 | Temperature, Heat and Absolute Zero |
| | | | |
| 11 | T 11/11 | Chapter 16 | Heat Transfer |
| | | Lab | Specific Heat |
| 11 | R 11/13 | Chapter 17 | Change of Phase |
| | | | |
| 12 | T 11/18 | | Review |
| | | <i>Lab ???</i> | <i>Lab ???</i> |
| 12 | R 11/20 | Chapters 11, 13-17 | Exam: Atomic Nature of Matter, Liquids, Gases & Plasmas, Temperature and Heat |
| | | | |
| 13 | T 11/25 | Chapter 22 | Electrostatics |
| | | Lab | Pendulum |
| 13 | R 11/27 | Chapter 23 | Electric Current |
| | | | |
| 14 | T 12/2 | Chapter 19 | Vibrations and Waves |
| | | Lab | Ohm's Law |
| 14 | R 12/4 | Chapter 20 & 21 | Sound |
| | | | |
| 15 | T 12/9 | Chapter 26 | Properties of Light |
| | | Lab | Vibrating Strings |
| 15 | R 12/11 | Chapter 28 & 29 | Reflection and Refraction of Light |
| | | | |
| 16 | TBA | Parts of Chapters 19-23, 26, 27, 28, 29 | Review |
| | | | |
| 16 | TBA | Parts of Chapters 19-23, 26, 27, 28, 29 | Final: Electricity and Waves |
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Laboratory Notebook

(A link to interactive sample notebook pages may be found on my homepage.)

Purpose: To provide a formal, organized work space/log in which one can record data and work through the calculations of an experiment. It will help you organize your thoughts and retain useful information.

General:

The pages should be fastened securely, so the laboratory notebook should not be spiral-bound or perforated. A string-bound composition notebook is a good example of an acceptable notebook.

1. Write in pen. Neatly cross out mistakes. No white out! Do not rip pages out!
2. The inside cover should have information such as your name, address, home phone number, instructor, etc. This will ensure that the notebook and all the data that you have worked so hard to obtain will always find its way back to you.
3. The third page is where you should start a table of contents. Update this as necessary.
4. Number the pages as you go, using both sides of each page.
5. The first experiment should start on about the 5th page.
6. Skip a few pages between experiments.
7. Keep the notebook in chronological order. (I.e., record the data as it comes.) Avoid leaving space for things and filling them in later.
8. If you miss a lab, you must still write the title and date of the experiment at the appropriate point in the notebook.
9. Use the last several pages for reference. Write universal constants, equations, and reminders that you find frequently useful.

10. Show your lab notebook to the instructor before leaving lab!

For each experiment, label the following sections:

1. Title, Experiment Number, Date, Lab Partners, etc.

2. Lecture Notes

Record any diagrams, mathematical derivations and procedural notes given by the instructor. The **purpose** of the experiment should be prominently displayed first. Everything mentioned in the prelab discussion should be here.

3. Data/Calculations

Any data you take goes here first!!! Data must be taken directly into the laboratory notebook as you acquire it. The laboratory report is a final draft only. I reserve the right to deduct points if you are not taking data directly into the notebook. Also, attempt all calculations in the notebook first. Again, the laboratory report is a final draft only. Your **results** should stand out!

Remember: Data is taken directly into the lab notebook. Your first attempts at calculations are also written there. You don't have to write everything twice, but make sure your calculations are correct in the notebook before attempting to fill in the lab report. *If you are observed not using your lab notebook, a penalty of 10 points off your lab grade will result!*



Welcome to WebCT!

WebCT is a suite of tools developed by the University of British Columbia to deliver sophisticated Web-based courses. It is presently being used by universities and colleges all over the world to deliver online learning. If you have taken an online course at ACCC before, chances are you may have used WebCT already.

In this course, your instructor has decided to use some of WebCT's tools to help enhance your overall learning experience. Some of the tools you might use are for communicating with your instructor and fellow students, like the Mail, Discussions or Chat tools, while other tools allow you to access course handouts and materials, or take online quizzes. If you have any trouble using the tools, you can click on "Help," next to "Course Map" at the top of your screen.

To get into WebCT, follow these directions:

1. Go to <http://webct.atlantic.edu:8900/>
2. Click "Log on to My WebCT."
3. Enter your User Name, which is your last name and the last 4 digits of your Social Security #. For example: **smith1234**. Do not use any spaces, and use all lower case letters. (**Note:** If your last name is hyphenated, for example: *Smith-Jones*, then only use the first part of the name, followed by the last 4 digits of your Social Security #. For example: *smith1234*.)
4. Enter the Password, which is your birthday (mm/dd/yy - no dashes or spaces). Eg. If you were born on May 21, 1967, you would type: **052167**
5. Click OK.
6. Click on the course name located in the upper left corner to enter the course.

If you have any technical trouble with getting into your course, feel free to contact the Instructional Technology Department during business hours by phone (1-800-617-2191) or via the Web at <http://www.atlantic.edu/onlinehelp>

A Note about accessing your course from home:

Please use one of the recommended web browsers: Microsoft Internet Explorer 5.0, 5.5, 6.0 (PC), Microsoft Internet Explorer 5.1 (Mac OS9, OSX.1), Microsoft Internet Explorer 5.2 (Mac OS9, OSX.2), Netscape 6.2.x (PC and Mac), Netscape 7.0 (PC and Mac OSX).

AOL users: There may be some problems with taking online tests. If this happens to you,

do not use the AOL browser to get into your WebCT course. Instead, connect to the Internet using AOL, minimize AOL and use one of the recommended browsers. Internet Explorer users are urged NOT to save their passwords when login box appears.

(If you do not have a computer at home, you can still access WebCT in any one of the computers labs at our Mays Landing, Atlantic City or Cape May campus locations.)

Frequently Asked Questions

What do I need on my home computer?

You'll need Windows 98, 2000 or XP, or Macintosh OS9, OS10.1.x, 10.2.x. You will need a connection to the Internet (e.g. 56K Dialup, Cable, or DSL, etc.) You should also have one of the recommended browsers:

- AOL 7.0 and 8.0 (PC)
- Microsoft Internet Explorer 5.0, 5.5, 6.0 (PC)
- Microsoft Internet Explorer 5.1 (Mac OS9, OSX.1)
- Microsoft Internet Explorer 5.2 (Mac OS9, OSX.2)
- Netscape 6.2.x (PC and Mac)
- Netscape 7.x (PC and Mac OSX)

The semester's officially started, but I still cannot log in. Now what?

Be sure you are typing your login information (UserID and Password or Course codes) correctly as listed on the first page of this letter. If you still need help, call the ACCC Online Course Helpline (1-800-617-2191) or send your question via the Online Help Request Form at: <http://www.atlantic.edu/onlinehelp>

What if I'm able to access my course just fine, but later in the semester I cannot get in?

If at any time during the semester our academic servers go down for maintenance or technical problems, you can verify their status by checking the Server Status Page, at <http://www.atlantic.edu/status.html>

I have a personal firewall on my home PC. Is this a problem?

YES. Look at your firewall software documentation for how to temporarily disable the firewall when you want to work on your online course.

I have software on my computer that stops those annoying Internet pop-up ads. Is this a problem?

YES. Some of our online courses have tools that open in new windows (like Mail, Quizzes, etc). Refer to the documentation that came with your pop-up stopper software to temporarily disable it when you want to work on your course.

I use Yahoo Companion. Is this a problem?

YES. Disable it when you want to work on your online course.

When I attempt to log in to WebCT I receive a message: "You entered an incorrect username or password."

Your username is your last name plus the last 4 digits of your SS#. Your password is your birthday (mm/dd/yy - no dashes or spaces).

When I attempt to log in to WebCT I receive a message: "Page cannot be displayed." OR "When I attempt to go to WebCT I receive a blank screen or message: "Unauthorized to view this page."

If you have a firewall installed on your computer, you must disable it or open up port 8900 on it to access your course through WebCT. Look at your specific firewall software documentation for how to temporarily disable it.

Every time I click to log on to WebCT, I am re-directed to a search engine (perfectnav).

Make sure that you do not have Kazaa or another peer to peer (P2P) file sharing service installed on your computer. If so, it's been known to conflict with logging into WebCT in many instances. If that's the case, it must be disabled or even sometimes uninstalled for you to be able to log into WebCT.

When I click on Mail and Discussions or when I try to take an exam nothing seems to happen.

If you are having difficulties with taking Exams or using the Mail and Discussions tools then you probably have a pop-up blocker installed on your computer. If so, disable the pop-up blocker software for those WebCT tools to work.

I can access my course, but when I try to click on any of the icons on the homepage of the course I get a blank screen.

Check to see if you have Yahoo Companion or another Internet Companion installed on Internet Explorer's toolbar. If Yahoo Companion is installed, you will see a red Y on the toolbar near the top of Internet Explorer. You will need to click on this Y and uninstall Yahoo Companion to eliminate the problem.

