General Physics I - PHY 111
Sections #22724, #22726, #22728 – Spring 2010

Prerequisites: Trigonometry, or instructor's consent.
Time & Location:
Lecture; M, W, F
9:00-9:50am – PS 175,
10:00-10:50am – PS 168,
11:00-11:50am – PS 176
Lab; various times – PS 169
Instructor: Dr. David Raffaelle, Office; PS 102,
Phone/Voice Mail; 623.845.3676.
e-mail; david.raffaelle@gcmail.maricopa.edu
Office hours: M,W,F: 8:00-8:50 am, T: 1:00-2:00 pm, and 4:30 – 5:30 pm.
Text:
• Physics, 2nd edition, Giambatista, Richardson, and Richardson, McGraw Hill 2010.
Full text isbn: 0-07-340453-5
Vol.1 isbn: 0-07-7350070-7 (3 hole punched, soft cover)
Vol.2 isbn: 0-07-735069-3 (3 hole punched, soft cover)
(Copies of the text are on reserve at the library and the front office in the physical sciences building)
•College Physics Only, lab manual –check with lab instructor.

Materials: Scientific calculator, three ring binder.

Course Description: A non-calculus approach to the principles of general physics. Includes mechanics, fluids, sound and heat. Recommended for pre-professional and suggested for certain other majors.
Course Competencies:
1. Apply the scientific method and other critical thinking models to physical phenomena for hypotheses development, experimental design, data acquisition and analysis.
2. Write accurate and meaningful reports analyzing experiments, both qualitatively and quantitatively.
3. Explain current and historical contexts for the principles and applications of physics
4. Estimate realistic values for practical problems.
5. Explain the application of physical principles to various physical phenomena.
6. Apply logical, efficient and effective problem solving techniques using graphical, mathematical and written communications.
7. Work effectively in collaborative groups.
8. Model physical phenomena using computers and other technical tools.
9. Solve practical and meaningful problems that closely resemble real-world physical situations.

Grading:

12/13 Homework Assg. at 10 pts each	= 120 pts
14/15 Reading Quizzes at 4 pts each	= 56 pts
Laboratory	= 200 pts
4 Tests at 100 pts each	= 400 pts
1 Final Exam	= 100 pts
Total points possible	876 pts

Grades will be determined according to the following scale:

784 - 876 = A
697 - 783 = B
570 - 696 = C
438 - 569 = D
0 - 437 = F

Homework: Homework will be assigned during the lecture period. Homework assignments are due at the beginning of class upon date specified. Students will be allowed to miss or drop one homework assignment consequently no late homework (15 minutes after the start of class) assignments will be accepted. One problem from each homework assignment will be selected at random for grading. *Students must show their work to receive full credit for the assignment*. Students should note that it is not always possible for the instructor to grade and return the homework before exams. A complete list of homework problems is attached.

Reading Quizzes: Reading quizzes will be distributed at the beginning of the period on the dates specified by the attached schedule. Students arriving late for class will not be allowed to take the reading quiz. Students will be allowed to drop one reading quiz hence there are no make-up quizzes.

Labs: The specifics of each lab are governed by that labs particular instructor. At the end of the semester your lab grade will be converted to a scale where 200 points is the maximum.

Tests: Four chapter tests will be given according to the attached schedule. Note: tests will be taken during the lab period. Students will be supplied with a generic instructor generated equation sheet that they may use during the test. Students who miss their normally scheduled test time will be allowed to make up one test during the semester. All make up test will be administered simultaneously during the last week of the semester. Students who do not miss any of their scheduled tests will be allowed to re-take one test of their choice at this time.

Final Exam: The final exam is comprehensive and must be taken by all students. Students will be supplied with a generic instructor generated equation sheet that they may use during the exam.

Course Policies:
Attendance: Each student is expected to attend all classes. After 3 hours of unexcused absences the instructor *may* initiate the withdrawal process. Only students who are officially enrolled in the course will be allowed to attend class with no exceptions. Work missed during officially excused absences (officially excused by the Office of Student Services) may be made up by *prior* arrangement with the

instructor. Instructor excused absences must be obtained *prior* to the day of the student's absence.

Withdrawal: Any student who meets both of the following criteria will be automatically withdrawn from the course by the instructor: (i) 6 or more hours of unexcused absences, (ii) current average points earned below 50%. Withdrawal deadlines are listed on the attached schedule.

Cell Phones: As a general policy all cell phones are to be turned off and "put away" during class. Text messaging is not allowed during class. Any student suspected of text messaging will be asked to leave the classroom. On the third such instance the instructor will withdraw the student from the course permanently for disruptive behavior. Students expecting calls in emergency situations are asked to set their phones to vibrate. As a rule all cell phones must be put away (stowed in backpacks, purses, pockets etc.) during tests.

Tardiness: Late arrivals are disruptive to the class as a whole. Therefore while students who are late are still encouraged to attend class they will not be allowed to turn in homework. In addition students who arrive late for quizzes or tests will not be given any extra time.

Academic Misconduct: The definitions of and the policies governing academic dishonesty are described in detail on pages 330 of the 2009-10 student handbook. In addition to these the following rule will apply to this class. Any student who cheats on a test, homework assignment or quiz will be given a grade of zero for that assignment.

Audio/Visual Recording: Neither audio nor visual recording of class will be permitted.

Disability Statement: If you have a disability that may have some impact on your work in this class and for which you may require accommodations, you need to notify the Disability Services Resource office, located in TDS 100. Their phone # is 623.845.3080.

Course Content: The instructor reserves the right to alter the course content and or the schedule, via verbal announcement, in order to more fully meet the needs of this particular group. *The student is responsible for such changes even if the student is absent on the day such announcements are made.*

Recommendation Letters: I will gladly write letters of recommendation for good (grade of A or B) PHY 111 students. As a matter of principle, however, this is only done for students who waive their right to read the recommendation letters and who authorize the instructor to disclose their grades.

Support Services:

- *Your Instructor*.
- *Center for Learning*: CL, free scheduled or "drop-in" tutoring service. group or one-on-one tutoring is available).
- *SI Instructor*, SI instructor will hold regular office hours again at *Center for Learning*, this is in addition to tutoring.

2nd Edition

Chapter	Multiple Choice	Problems
1	7	13, 17, 24, 32, 35, 37, 48, 56, 62, 67
2	1	10, 15, 21, 34, 39, 44, 47, 52, 57, 64
3	1, 4, 10	19, 24, 31, 48, 51, 52, 53, 54, 60 79,
4	7, 11	6, 22, 57, 78, 87a, 89, 96, 112, 127, 142, 150
5	7, 8	1, 4, 11, 1, 28, 32, 37, 41, 43, 49, 66, 79
6	3, 4, 5	1, 8, 13, 24, 27, 29, 37, 53, 59, 71, 75, 87
7	5	4, 7, 18, 39, 42, 43, 64, 65, 67
8	10	10, 23, 30, 33, 35, 49, 52, 59, 62, 75, 76
9	6, 7	9, 12, 18, 28, 32, 35, 40, 45, 47
10	2, 3	27, 30, 62,
11		
12		
13		
14		

Physics 111 – Spring 2010

Monday	Tuesday	Wednesday	Thursday	Friday
January 18 **MLK Holiday**	19 Lab: Introduction	20 Lab: Introduction	21	22 Reading Quiz 1
25 Homework 1 Lab: Conversions	26 Lab: Conversions	27 Lab: Conversions	28	29 Reading Quiz 2
Feb 1 Homework 2 Lab: Digital free-fall	2 Lab: Digital free-fall	3 Lab: Digital free-fall	4	5 Reading Quiz 3
8 Homework 3 Lab: **Test 1**	9 Lab: **Test 1**	10 Lab: **Test 1**	11	12 Reading Quiz 4
15 **President's Day Holiday**	16 Lab: Newton's Law	17 Lab: Newton's Law	18	19 Reading Quiz 5
22 Homework 4 Lab: Newton's Law	23 Lab: Friction	24 Lab: Friction	25	26 Reading Quiz 6
March 1 Homework 5 Lab:Circular Motion.	2 Lab: Circular Motion	3 Lab: Circular Motion	4	5 Reading Quiz 7
8 Homework 6 Lab: **Test 2**	9 Lab: **Test 2**	10 Lab: **Test 2**	11	12 Reading Quiz 8
15 Spring Break	16 Spring Break	17 Spring Break	18 Spring Break	19 Spring Break
22 Homework 7 Lab: Ballistic Pend	23 Lab: Ballistic Pend	24 Lab: Ballistic Pend	25	26 Reading Quiz 9
29 Homework 8 Lab:Moment Inertia	30 Lab:Moment Inertia	31 Lab:Moment Inertia	**April** 1	2 Reading Quiz 10
5 Homework 9 Lab: **Test 3**	6 Lab: **Test 3**	7 Lab: **Test 3**	8	9 Reading Quiz 11
12 Homework 10 Lab: Specific heat	13 Lab: Specific heat	14 Lab: Specific heat	15	16 Reading Quiz 12
19 Homework 11 Lab:Speed of Sound	20 Lab: Speed of Sound	21 Lab: Speed of Sound	22	23 Reading Quiz 13
26 Homework 12 Lab: **Test 4**	27 Lab: **Test 4**	28 Lab: **Test 4**	29	30 Reading Quiz 14
May 3 Homework 13 Lab: Make Up Test	4 Lab: Make Up Test	5 Lab: Make Up Test	6	7 Reading Quiz 15
10 9:00 am Final Exam 11:00 am Final Exam	11	12 10:00 am Final Exam	13	14 Commencement

Last day for withdrawal without instructor's signature: March 5th

Last day for student initiated withdrawal: April 26th.

Equation Sheet - College Physics

$g = 9.8\ m/s^2$
$G = 6.67 \times 10^{-11}\ Nm^2/kg^2$
$M_E = 5.98 \times 10^{24}\ kg$
$R_E = 6.38 \times 10^{6}\ m$
$\rho_{air} = 1.29\ kg/m^3$
$\rho_{water} = 1000\ kg/m^3$
$1\ atm = 1.01 \times 10^5\ Pa$
$R = 8.31\ J/mole\ K$
$R = 0.0821\ Li\text{-}atm/mole\ K$
$k_B = 1.38 \times 10^{-23}\ J/K$
$V_{light} = 3 \times 10^8\ m/s$
$N_A = 6.02 \times 10^{23}$
$\sigma = 5.67 \times 10^{-8}\ W/m^2K^4$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\bar{v} = \frac{\Delta x}{\Delta t} = \frac{x - x_0}{t - t_0}$$

$$\bar{a} = \frac{\Delta v}{\Delta t} = \frac{v - v_0}{t - t_0}$$

$$v = v_0 + a\,t$$

$$x - x_0 = v_0 t + \frac{1}{2} a\,t^2$$

$$v^2 = v_0^2 + 2a(x - x_0)$$

$$x - x_0 = \frac{1}{2}(v + v_0)t$$

$$\sum F = m\,a$$

$$w = m\,g$$

$$f_{s,k} = \mu_{s,k}\,n$$

$$W = F\Delta x \cos\theta$$

$$KE = \frac{1}{2} m v^2$$

$$W_{net} = \Delta KE$$

$$PE = mgy$$

$$PE = \frac{1}{2} k x^2$$

$$KE_i + PE_i = KE_f + PE_f$$

$$W_{nc} = \Delta KE + \Delta PE$$

$$\bar{P} = \frac{W}{\Delta t}$$

$$\bar{P} = F v$$

$$p = mv$$

$$impulse = F\Delta t$$

$$F\Delta t = \Delta p = mv_f - mv_i$$

Conservation of Momentum

$$m_1\vec{v}_{1i} + m_2\vec{v}_{2i} = m_1\vec{v}_{1f} + m_2\vec{v}_{2f}$$

Conservation of Kinetic Energy

$$\frac{1}{2} m_1 v_{1i}^2 + \frac{1}{2} m_2 v_{2i}^2 = \frac{1}{2} m_1 v_{1f}^2 + \frac{1}{2} m v_{2f}^2$$

$$\bar{\omega} = \frac{\Delta\theta}{\Delta t} = \frac{\theta - \theta_0}{t - t_0}$$

$$\bar{\alpha} = \frac{\Delta\omega}{\Delta t} = \frac{\omega - \omega_0}{t - t_0}$$

$$\omega = \omega_0 + \alpha\,t$$

$$\theta - \theta_0 = \omega_0 t + \frac{1}{2}\alpha\,t^2$$

$$\omega^2 = \omega_0^2 + 2\alpha(\theta - \theta_0)$$

$$\theta - \theta_0 = \frac{1}{2}(\omega + \omega_0)t$$

$$s = r\theta$$

$$v_t = r\omega$$

$$a_t = r\alpha$$

$$a_c = \frac{v^2}{r} = r\omega^2$$

$$F_{grav} = \frac{G m_1 m_2}{r^2}$$

$$T^2 = \left(\frac{4\pi^2}{GM}\right) r^3$$

$$v^2 = \frac{GM}{r}$$

$$v = \frac{2\pi r}{T}$$

$$g = \frac{GM}{r^2}$$

$$PE = -\frac{G m_1 m_2}{r}$$

$I_{ring} = mr^2$; $I_{disc} = 0.5\ mr^2$; $I_{sphere} = 0.4\ mr^2$

$$\tau = rF\sin\theta$$

$$\Sigma\tau = I\alpha$$

$$KE_{rot} = \frac{1}{2} I\omega^2$$

$$L = I\omega$$

Cons. of Angular Momentum
$I_i\omega_i = I_f\omega_f$

$$Y = \frac{FL_0}{A\Delta L};\ S = \frac{Fh}{A\Delta x};\ B = \frac{-V\Delta P}{\Delta V}$$

$$\Delta L = \alpha L_0 \Delta T$$

$$\Delta A = \gamma A_0 \Delta T$$

$$\Delta V = \beta V_0 \Delta T$$

$$T_C = T_K - 273$$

$$T_F = \frac{9}{5} T_C + 32$$

$$\rho = \frac{m}{V}$$

$$P = \frac{F}{A}$$

$$P = P_0 + \rho g h$$

$$F_{buoyant} = \rho V g$$

$$A_1 v_1 = A_2 v_2$$

$$P + \frac{1}{2}\rho v^2 + \rho g y = \text{constant}$$

$$Q = mc\Delta T$$

$$Q = mL$$

$$PV = nRT$$

$$PV = NkT$$

$$PV = \frac{2}{3} N\left(\frac{1}{2} m\overline{v^2}\right)$$

$$\frac{1}{2} m\overline{v^2} = \frac{3}{2} k_B T$$

$$U = \frac{3}{2} nRT$$

$$v_{rms} = \sqrt{\frac{3k_B T}{m}}$$

$$Q = mc\Delta T$$

$$Q = mL$$

$$\frac{Q}{\Delta t} = \frac{kA(T_h - T_c)}{L}$$

$$P = \sigma A e\left(T^4 - T_s^4\right)$$

$$W = -P\Delta V$$

$$\Delta U = Q + W$$

$$e = \frac{W}{|Q_{in}|} = 1 - \frac{|T_C|}{|T_h|}$$

$$F_s = -kx$$

$$T = 2\pi\sqrt{\frac{m}{k}}$$

$$\lambda\, f = v$$

$$v = (331 m/s)\sqrt{\frac{T}{273}}$$

$$f = \frac{1}{2\pi}\sqrt{\frac{k}{m}}$$

$$\omega = \frac{k}{m}$$

$$v = \sqrt{\frac{k}{m}}\left(A^2 - x^2\right)$$

$$a = \frac{k}{m} x$$