CENTRAL ALABAMA COMMUNITY COLLEGE
Official Course Syllabus: PHY 213 - Cal-based PHYSICS I
Fall Semester, 2013

INSTRUCTOR: K. W. Nicholson
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Office: BS 214 **Office Hours** : Tuesday & Thursday 11:30 AM -1:00 PM, others by appoinntment

COURSE TITLE AND CREDIT:

PHY 213 - General Physics with Calculus I
2.5 Hrs Lecture 2 Hrs Lab Credit: 4 semester Hours

COURSE CO-REQUISITES: Math 125 Calculus I

I. COURSE DESCRIPTION:
This course provides a calculus based study in classical physics. Topics included are: mechanics, heat and thermodynamics.

II. COURSE OBJECTIVES: As a result of successfully completing this course the student will be able to:

1. Make measurements accurately and analyze data in lab experiments.
2. State the difference between distance and displacement, and between speed and velocity.
3. Understand and use the concept of acceleration.
4. Solve constant acceleration problems using the kinematic equations of motion.
5. Analyze and solve simple projectile motion problems involving one and two moving objects.
6. Use free body diagrams in the analysis of simple statics and motion problems.
7. Extend Newton's laws to solve rotational motion problems.
8. Use Archimedes Principle to solve simple bouancy problems.
9. Understand the difference between temperature and heat.
10. Understanding Simple Harmonic Motion
11. Solve simple applications of the first and second laws of thermodynamics.

III. CONTENT AND ORGANIZATION:

1.Serway & Jewitt's, Chapter 1: Measurement.
2.Serway & Jewitt's, Chapter 2: Distance, displacement, speed and velocity.
3.Serway & Jewitt's, Chapter 3: Vectors
4. Serway & Jewitt's, Chapter 4: Projectile and circular motion
5. Serway & Jewitt's, Chapter 5: Force and Newton's three laws of motion.
6.Serway & Jewitt's, Chapter 6: Circular Motion.
7.Serway & Jewitt's, Chapter 7 & 8: Energy
8.Serway & Jewitt's, Chapter 9: Linear Momentum & Colllisions.
9.Serway & Jewitt's, Chapter 10: Rotational Motion
10. Serway & Jewitt's, Chaper 11: Angular Momentum
11.Serway & Jewitt's, Chapter 12: Statics & Elasticity
12.Serway & Jewitt's, Chapter 14: Fluid Mechanics.
13.Serway & Jewitt's, Chapter 15: Simple Harmonic Motion

14..Serway & Jewitt's, Chapter 19 - 22: Heat and Thermodynamics

LABS:

1. Measurement
2. Intro to Motion
3. Projectile Motion
4. Force I
5. Force II
6: Force, Work & Power
7. Work & Potential Energy.
8. Momentum
9: Rotation Motion Lab
10: Torque
11: Statics
12: Archimedes Principle
13. Heat & Thermo Lab 1: Temperature
14: Heat & Thermo Lab 2: Heat Transfer I
15: Heat & Thermo Lab 5: Phase Change

IV. References: Alan Van Heuvelen's ALPS Kits, Kinetic Books text (on computers in lab)

V. Required (Graded) Assignments: 10-15 -15 pt experiments, 3 -100 point tests, 1- 200 point final, daily Reading Quizzes, 100 points

VI. EVALUATION:

Item	Discussion
10 -15 -20 pt Experiments approximately 300 pts total Thursday's 1 - 3 **Note: You will notice there are more than 15 labs. These are all suggestions. You will select your own 15 labs, or design and conduct your own experiments.** You will spend the final 15 min selecting your next lab.	Labs will be done in groups of my choosing. Data sheets and lab write-ups will be turned in individually. You must submit a copy of your data sheet on Wednesday prior to lab. You should come with most of your lab write-up completed, except for values obtained in lab, analysis, DOA, and conclusion. You may turn in labs electronically, either on flash drives, or email. Lab experiment write-ups are due at the end of the lab period. **None accepted late.** **You can do labs early, but not late.**
On time (Reading) Quizzes 100 pts total Daily	On time (Reading) quizzes cannot be made up or turned in late. (That's why we call them on time quizzes.)
3 - 100 pt tests dates unknown	*No make up tests will be given. First missed test will be replaced by 1/2 of your final exam score, any other missed tests will receive 0.* *If 100 % of the class agrees to take tests on Wednesdays 7:30 - 9:15, you will have more time to take tests.*

1-200 pt Final Exam date unknown	Final will be comprehensive.
50 points bonus! **Can be obtained by either:** **Doing a project (investigate** **something, do a really neat** **experiment, or build something** **useful.)** **Or join the science team.**	If you plan to go for the 50 point bonus, you must either join the science team or submit a pruject proposal **by Tuesday, September 10, 2013.**

Note 1: Use of communication devices such as pagers, cell phones, walkie talkies, or whatever, is prohibited in this class. If one rings, buzzes, vibrates or distracts you or the class, you may be dismissed from the course.

Note 2: Playing games on computers in the physics lab may result in your being dismissed from this course.

GRADES:

The above total, excluding bonus points, is approximately 850 points and your accumulative total will be divided by that amount to calculate your final average.

90-100% = A, 80-89% = B, 70-79% = C, 60-69% = D, 0 - 59% = F

NOTES:
l. You should keep all returned papers. You should also keep track of the ratio (your accumulative total)/(The accumulative total possible to date) as the semester progresses.

VII. TEXTBOOKS CURRENTLY BEING USED:
 Physics for Scientists & Engineers by Serway & Jewitt 9th edition
 Reality Physics Workbook, k.w.nicholson

VIII. Other Important Information:
1. Attendance: We no longer have the permission to drop students for lack of attendance.

2. If you decide to drop this course, you must do so formally before mid-term by going to student services in the Administration Building and filling out a drop form. If simply stop coming to class, you will receive an F in this course!

3. If you have a disability that may prevent you from meeting the course requirements, contact the instructor before the end of the first week of classes to file a student disability request and to discuss a reasonable plan. Course requirements will not be waived but accommodations may be made to assist you in meeting the requirements, provided you are timely in working with the instructor to develop a reasonable accommodation plan.

Physics 213 Fall 2013
Tuesday & Thursday 1:00 - 3:15

Tuesday	Thursday is Exp & planning day
August 20 OTQ #1	August 22 OTQ 2a Experiment 1 Measurement
August 27 OTQ Orientation 2.1 - 2.4 pos, vel, acc, & motion diagrams 2.5 - 2.6 Kinematic Eq. w/constant acc	August 29 OTQ Expiment 2
September 3 3.1 - 3.4 Vectors 4.1 - 4.5 2-D motion, Projectile Motion, & Circular Motion	September 5 Expiment 3
September 10 5.1 - 5.6 Newton's 1st & 2nd Laws 5.7 Newton's 3rd Law	September 12 Expiment 4
September 17 Test 1 5.8 Friction	September 19 Expiment 5
September 24 6.1 - 6.3 Newton's Laws & Circular Motion 7.1 - 7.5 Work	September 26 Expiment 6
October 1 7.6 - 7.9 More work 8.1 - 8.6 Potential Energy	October 3 Expiment 7
October 8 9.1 - 9.4 Linear Momentum 9.5 - 9.7 Center of Mass & Rockets	October 10 Expiment 8
October 15 Test 2 10.1 - 10.3 Rotational Motion	October 17 (Mid Semester today) Expiment 9
October 22 10.4 - 10.6 Kin En, Mom of Inertia, Torque 10.7 - 10.9 Work & Power	October 24 Expiment 10
October 29 11.1 - 11.4 Angular Momentum 12.1 - 12.2 Statics I	October 31 Expiment 11

November 5 12,3 - 12.4 Statics II 14.1 - 14.4 Pressure & Bouyancy	November 7 Expiment 12
November 12 Test 3 14.5 - 14.7 Bernoulli's Principle	November 14 Expiment 13
November 19 15.1 - 15.3 Simple Harmonic Motion 15.4 - 15.5 Energy and Pendulums	November 21 Expiment 14
November 26 Happy Thanksgiving	November 28 Happy Thanksgiving
December 3 19.1 - 19.5 20.1 - 20.4 Heat & First Law of Thermo	December 5 Expiment 15
December 7 22.1 - 22.3 Heat Engines 22.4 - 22.6 Carnot Engine, Entropy	December 9 Final Exam 1 - 3 ?
December 14 Review for Final Optional	December 16 Final Exam 1 - 3 ?

Note! This pacing chart is probably incorrect and subject to change at any time.

K.W. Nicholson's Schedule for Fall 2013

Monday & Wednesday	Tuesday/Thursday	Friday
Office hours by appointment only	11:30 - 1:00 Office	Office Hours by Appointment only
	1 - 3:15 Phy 213 & 201	

Homework Note: These are suggestions only, you should be in charge of doing "enough" problems to master the concepts and techniques laid out in the Rules of Engagement.

Chapter 2 Q2, P 3,5,7,12,15,23,27,50,51, **Bonus # 1 = 70**

Chapter 3 P 7,9,27,31,35,47

Chapter 4 Q 8, P 3,5,11,17,19,27,29,**Bonus # 2 = 32**

Chapter 5 P 3,9,11,14 ans a) 181° ccw, b) 11.2 kg, c) 37.5 m/s, d) **v**= -3.75**i** - .09**j** , 15, 21,25,29,41,55

Chapter 6 5,7,9,17,19,21,25

Chapter 7 2, ans F=31.7N, W = 1590J, 4, ans a)3.28 x10^{-2} J, b) - 3.28 x10^{-2} J, 9,11,13,15, 24, ans 2 J, b) 5 m/s,

c)6.3 J, 26, ans a&b) 60J, 31, 33, 35,37,41,45

Chapter 8 Q11, P 1,5,13,23,31,33,36,41,43,45

Chapter 9 P 1,7,9,13,15,17,19,20, ans .556 m, 24, ans $v_b=2\sqrt{gl}$, $v=(4M/m)\sqrt{gl}$, 25, 38,41, 43,49,51 **Bonus # 3 =44B**

Chapter 10 P3,5,7,13,17, 21, - 23,25,31, - 37,45,46, ans 2.36 m/s, 51,61,7179

Chapter 11 P 1,3,5,6,9, 11, 12, ans -220 kg m²/s in z direction, 15B, 25, 27, 29, 33

Chapter 12 P 3,7,9,13, 15,43,51, 69, 27,29,31,33,35

Chapter 14 P6, ans a) $P=1.01 \times 10^7$ Pa , b) 7.09 $\times 10^5$ N, 9,17,23,27,35 / 39,45,53

Chapter 15 P 1,3,5,7,2327,31

Chapter 19 P 1,3,5,7, 9,15,17,27,33,53

Chapter 20 P 3,7,15,23,35,38, ans a) -4 PV, b) 4 PV, c) -9.08 KJ

Chapter 22 P 1,3,7,11,14,23,35