Schedule for PHYS 3341.001. PHYSICS FOR BIO SCIENCE I

Spring 2006

This class meets in Founders North FN 2.102 on Tuesday and Thursday 12:30 to 1:45. The 28 classes of the course will be between January 10 and April 20 (inclusive).

Instructor: Dr. Paul MacAlevey paulmac@utdallas.edu. My office is at FO 2.708B and my phone extension is 4634.

Office Hours: 2:15 - 3:15 pm Tuesday and Thursday (or by appointment) at FO 2.708B.

I use e-mail to communicate with the class outside of class time as the need arises. Please send an e-mail to paulmac@utdallas.edu from your UTD account. (Remember to tell me that you are in PHYS 3341!) Check your UTD e-mail account every day. (If you need help with your UTD computer account, please call 972 883 2911 or visit the helpdesk at JO 3.906.)

Lab:

All students must register in the co-requisite course: Physics Laboratory I (PHYS 2125). The first day of that lab is Monday Jan 9.

Teaching Assistant: Stephanie Rafferty sar053000@utdallas.edu FO 1.418

Office Hours: 12:00 - 1:00 pm Monday and Wednesday (or by appointment)

Course Objectives:

We will cover material on Mechanics, Waves (and possibly Acoustics). I intend to include material from these topics that will be needed in professional exams such as MCAT. A tentative schedule is below.

Pre-requisites:

All students must have done calculus I (MATH 2417) or equivalent.

Required Materials:

We will use **"University Physics" (eleventh edition) by Young & Freedman** (ISBN: 0-8053-8684-X). New books for sale in the University bookstore include a Student Access Kit. This kit allows free registration to the homework Website (Mastering Physics). If you get your book from any other source, you will need to buy access to the homework Website separately.

The last pages of this syllabus can be cut up & stapled together to make flash-cards. You will need these in order to answer questions that I'll ask in class. Please have them ready for the class on Thursday. (I'm putting a PDF of these cards on the WebCT site just in case you lose yours.)

Grading:

Reading Quizzes	10%
Homework	15%
3 midterm Exams @ 20% each Drop one	40%
Final Exam	30%
Intangibles	5%

"Intangibles" include completion of reading quizzes and quality of summaries (if turned in)

Reading Quizzes:

I intend to begin each lecture with a brief (10 minute) reading quiz. The reading quizzes do not ask for mastery of the material. They may ask about terminology used or the 'caution' paragraphs and 'test your understanding' questions. The schedule lists the sections of the text to be read in preparation for the reading quiz.

Seats are assigned for the reading quizzes.

My assigned seat for all reading quizzes is _____

Homework:

Answers to homework questions will be graded on a Website. To get to it, go to your list of WebCT sites at http://webct.utdallas.edu. After you log-in, you will find a list of links to sites for courses that you have this semester. Click on the link PHYSICS FOR BIO SCIENCE I to get to the homepage for the course. The link called "Mastering Physics homework Website" will take you to the log-in page for the homework site.

Each homework assignment will have a due date. Work submitted on or before that date will be marked out of 100%. After this time the credit offered for the assignment falls to 70%. The assignment will disappear from this site about a week after the due date. After this time, the homework assignment cannot be done for credit.

Tests:

About half of the questions on exams will be about concepts i.e. they will ask you to use Physics principles to think through to answers rather than ask you to plug-and-chug.

You must have a UTD student card during all tests. All tests will be done with books closed. **Scientific calculators** are often needed for tests or exams and **it is up to you to have one**. You can bring a **single** 3"×5" **index card to any of the tests** (and can write on both sides of it). It must have been prepared by the person using it and be written by hand. All other books, notes, backpacks, purses, electronic devices (other than a scientific calculator) are to be placed at the sides of the room during the exam.

Any (academic) questions concerning the grading of a test must be brought to my attention before the end of the next day on which we meet. After this time, no grade will be changed for any academic reason.

Missed tests can only be made up in the case of <u>documented</u>, extenuating circumstances.
Any student INVOLVED in cheating will be reported to the Dean of Students. That Dean will decide on the penalty for a confirmed incident of cheating.

Using the Homework Website:

1. You can log-in immediately if you previously registered at this site. (Registration lasts for three semesters.) Skip to step 5 if you have registered already.

2. If you haven't got a login ID for this site then either

    b. Use your Student Access Kit to register (This is included with a new book with the ISBN that I gave above.) Be careful: this access code only works once

    c. Buy access ($41.60)

3. Please use your first and last names from your UTD Comet card. You will also need your student ID, just below your name on the front of your Comet card. The course ID is PMACALEVEY3341SPRING2006

4. If you have just registered, you will see,

User Properties for Paul MacAlevey	
User ID#:	**1081123**
Login ID:	paulmac@utdallas.edu
First Name:	Paul
Last Name:	MacAlevey
E-mail Address:	paulmac@utdallas.edu
Student ID:	
Course ID:	**REQUIRED:** please enter Course ID provided by instructor.
Save	

- Fill in this form and press the SAVE button

5. The previous steps take you to the welcome page. The top button in the navigation bar on the left of your screen will take you to the list of assignments.

6. **Do the assignment called "Introduction to Mastering Physics" tonight**. There is no credit for doing this assignment but it shows you how to use the site. It also shows you how to write vectors, Greek letters, subscripts, superscripts, mathematical constants and physical constants. This assignment introduces hints, serialized parts, randomized answers, Submit Answer, Submit Problem, the math display function, and the My Answers button. Unless instructed otherwise, give your answer correct to three significant figures. (Young & Freedman discuss significant figures in section 1.5.) As a rule-of-thumb, use four significant figures (or more) in your calculations and round to three significant figures at the very end of the calculation.

Assignments involve three types of problem:

- Skill-Builders (conceptual problems)
- Self-Tutoring-Problems (These are 'Socratic'. They offer hints that are often smaller questions that are intended to put you on the right path to solving the initial problem.)
- End Of Chapter problems (These are problems out of the book)

  Only about 20% of students like Mastering Physics at first. This is not surprising; people dislike homework in general and have to do more work because Mastering Physics prompts people for better answers. The combination of unfamiliar, difficult material and a new way of working can initially make them unsure of themselves. However,

  - The figure rises to over 90% student approval by the last weeks of a course
  - Student grades rise by 5-7 points

Scholastic dishonesty:

Of great importance to you as a student is that others perceive your degree as having value. That value is diminished if others suspect that a degree can be obtained through dishonest means. As your instructor, academic dishonesty gives me a false picture of the capabilities of the individual that is being dishonest. In a wider context, it gives me a false picture of what can be reasonably expected of my students.

The University has a policy on scholastic dishonesty. This policy is clearly articulated in Subchapter F section 49.36 of the policy on student discipline & conduct adopted by the University and used in this course. The full chapter 49 is at http://www.utdallas.edu/student/slife/chapter49.html. Students enrolling in the course are bound by this policy and are encouraged to read it. Any questions about this policy can be asked of the Dean of Students. Any suspected cases of scholastic dishonesty will be passed along to the Dean of Students.

Semester dates:

Jan 9 to May 3. The last class day in April 24

Last day to drop a class without a "W"…... Wed., January 25

WP or WF withdrawal period
begins……..…..Mon., February 13

last day to withdraw with
WP/WF……..…Thurs., March 16

The final is scheduled by the University to be at 5:00 on Wednesday, April 26th. (Note that this time is not the usual class time. Please check this date and time just before the exam at www.utdallas.edu/student/registrar/finals/finals06S.pdf .)

Lectures:

You should **plan to attend all class sessions.** To make the lecture more productive, **you will need to have read the assigned sections beforehand**. You will be in your assigned seat during every reading quiz. If you finish your quiz before other members of the class, please don't distract other member of the class by talking etc. However, **after we all have finished the quiz, I encourage everyone to move into the front rows so that you will be able to take part in class discussion**.

I do not undertake to talk about all possible Physics that is related to all topics mentioned in my schedule. **I'm relying on the fact that you can read the text** even though we need to discuss some parts of it later.

I do not propose to give my lectures in the traditional mode in which Science lectures are given. I intend to,

- Begin class with a reading quiz
- For every 'key point' that I want you to think about, there will be several steps,
  - A mini-lecture on the topic
  - Several questions are asked so that we can arrive at a better conceptual understanding
    - Each question will be projected for you
    - I'll pause for a minute to let you think about the question
    - I'll ask you to hold up the flash-card giving the best answer. (Remember that these answers are un-graded. Flash-cards are at the back of this schedule.) **Please participate!**
    - I'll ask everyone to convince their neighbor of the correctness of their answer. That will take us another minute or two. (Remember that the forcefulness of the claim doesn't always correlate well with correctness!)

      After a couple of minutes of discussion, I'll ask you to hold up a flash card giving the r**evised answer**. (This answer is not graded either.) [I'll skip this step if most of us have answered correctly the first time.]
    - I'll explain the correct answer
- After the lecture, I expect you to re-read the sections that we have covered. Work through the

‘example problems’ (green highlights) and do the assignment (or parts of it). After a topic has been completed, I suggest that you make a summary for yourself. It will help you to study for exams. More details about this are in my syllabus mentioned above.

I want to lecture in this way because,

- It is not possible to present all material in detail
- This method has been shown to enhance students’ conceptual understanding of the material.
    - Your ability to solve problems becomes much more robust. You will be able to solve problems that you have not seen before
    - You learn how to learn physics

This method of doing things is known as Peer Instruction and has been shown by Physics Education Research to be quite effective for many kinds of students. **It depends heavily on your being prepared for the lecture. You prepare by doing the reading assignments**. The first reading quiz is at the beginning of the next lecture.

There are mini-lectures built into this format but my lecture notes are not those that a student might take. If you miss a lecture and are looking for notes, I suggest that you get them from another member of the class. Careful attention should be paid to the course material as it is delivered. To help in this, please turn off all electronic devices that might distract you and others. Regular attendance at class sessions is expected.

I’ll ask the TA for the course to do **recitation/problem solving sessions** outside class time. While these are not compulsory, they have been found to be very helpful in the past. (If a supplemental instructor (SI) is assigned to the course, then they may offer such sessions too. My advice is to be there!)

Withdrawal from the course:

If a student is unable to complete the course in which he/she is registered, it is the student’s responsibility to withdraw from the course by the appropriate date. (This date is given above.) The instructor cannot initiate this process. If the student stops attending class but does not officially withdraw, he/she will receive a grade based on their performance in the course. If you withdraw from the course, as a matter of courtesy please send me an e-mail saying that you have.

Be sure to read the relevant sections before the lecture! 10% of your final grade depends on the results of reading quizzes!

Tentative Schedule

Some sections are explicitly skipped (to allow us time to reach other material). These are 2.6, 3.5, 5.5, 7.4, 8.6, chapter 9, 10.2 – 10.7, 11.2 and 12.2 – 12.8. **You are responsible for all sections of the chapters mentioned in the tentative schedule that is below.** This holds even if I don't mention a particular item explicitly during a lecture.

Again, **the reading assignment is to be done before the date on which it is listed**. Problems that are assigned will appear on the Mastering Physics Website along with the date on which the assignment is due. Changes to this tentative schedule will be mentioned during lecture.

Date	Reading assignment	Lecture material
Tuesday Jan 10	none	Introduction/Questionnaire
Thursday Jan 12	1.1 – 1.6	Units/orders of magnitude/significant figures
Tuesday Jan 17	1.7 – 1.9	vectors
Thursday Jan 19	2.1 – 2.2	velocity
Tuesday Jan 24	2.3 – 2.5	acceleration
Thursday Jan 26	3.1 – 3.2	Velocity and acceleration vectors
Tuesday Jan 31	3.3	Projectiles
Thursday Feb 2	3.4	Circular Motion
Tuesday Feb 7	4.1 – 4.3	Newton's first two laws
Thursday Feb 9	4.4 and 4.6	Mass & Weight/Free-body diagrams
Tuesday Feb 14	5.1 – 5.3	Applying Newton's laws
Thursday Feb 16		**First Midterm Test** – chapters 1 to 3
Tuesday Feb 21	5.4	Circular Motion
Thursday Feb 23	4.5	Newton's third law
Tuesday Feb 28	1. 10 (dot product only), 6.1	Dot product/Work
Thursday Mar 2	6.2	Work & Kinetic Energy
Tuesday Mar 7		*Enjoy Spring Break!*
Thursday Mar 9		*Enjoy Spring Break!*
Tuesday Mar 14	6.3 – 6.4	Work with Varying Forces/Power
Thursday Mar 16	7.1	Gravitational Potential Energy
Tuesday Mar 21	7.2	Elastic Potential Energy
Thursday Mar 23		**Second Midterm Test** –chapters 4 to 6
Tuesday Mar 28	7.3, 7.5	Conservative Forces/Energy Diagrams
Thursday Mar 30	8.1	Impulse & Momentum
Tuesday Apr 4	8.2, 8.3	Conservation of Momentum/Inelastic collisions
Thursday Apr 6	8.4, 8.5	Elastic collisions/Center of mass
Tuesday Apr 11	1.10 (vector product only), 10.1, 12.1 (you don't need to read the introduction to either chapter)	Vector Product/Torque and Lever-arm/ Newton's law of Gravitation
Thursday Apr 13	11.1, 11.3, 11.4	Equilibrium & Elasticity
Tuesday Apr 18	13.1 – 13.2	Describing Oscillation/Simple harmonic Motion
Thursday Apr 20		**Third Midterm Test** –chapters 7, 8 and those parts of chapters 10, 11 and 12 on this schedule

Thursday April 27, at 11:00 am		**Final Exam - Comprehensive** (The University decides on the time for final exams. Check it at www.utdallas.edu/student/registrar/finals/finals06S.pdf Just before the exam. Inform the registrar about any conflicts with the times for other exams etc.)

This schedule is only tentative. If we move faster than indicated, we'll also cover

13.5, 13.8	Simple Pendulum/Resonance
All of chapter 14	Fluids
16.1 – 16.8	Sound