Course Syllabus

Course Information

PHYS 3341.001 PHYSICS FOR BIO SCIENCE I Spring 2008. Class meets Tuesday and Thursday from 11:30 a.m. to 12:45 p.m.

Professor Contact Information

Dr. Paul MacAlevey; (972) 883-4634; paulmac@utdallas.edu; office hours are at my office FO 2.708B from 2:00 – 3:00 Tuesday and Thursday. I intend to use the inbox on WebCT 6 with which to send e-mail. I expect you to check this inbox at least daily. (If you need help with your UTD computer account, please call 972 883-2911 or visit the helpdesk at JO 3.906.)

Teaching Assistants:

Austin Peel acp034000@utdallas.edu

TA office hours/recitation sessions: TBA

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Pre-requisite: MATH 2417.

Co-requisite: Must register separately for College Physics Lab I (PHYS 1101). Since this lab is not part of PHYS 3341 and perfect co-ordination between this course and that lab should not be expected.

Required Textbooks and Materials

The Physics department recommends the textbook **"University Physics" (twelfth edition) by Young & Freedman** (ISBN: 080532187x) for all calculus-based courses in introductory Physics. **This ISBN corresponds to a book with** a free 'Student Access Kit'. The kit allows you **free access to the homework website with which you will do your homework**. ***I require you to have access to this website during the whole of the semester***. Any mention of chapter or section numbers refer to this book. You will want volume 1 (on Mechanics, Waves and Thermodynamics) for this course. However, if you do Physics II in this department then it will be cheaper to buy the complete text rather than individual volumes.

If you prefer to use another textbook then be aware that you will have to find the appropriate sections in the book of your choice. Similar in content to the twelfth edition of **"University Physics" are;**

- The eleventh edition of **University Physics (!)**
- "Fundamental of Physics" Halliday, Resnick & Walker
- "Physics for Scientists and Engineers" R. Serway and R. Beichner

Some students like this one;

- "Physics; a strategic approach" R. Knight. (His approach is different.)

I'm not requiring that you buy any of these. ***I require that you find and use a textbook that you like.*** The edition number is not that important. Feel free to borrow older editions from the library if you like them.

The last pages of this schedule can be cut up & stapled together to make flash-cards. You will need these in order to respond to questions that I'll ask in class. Please have them ready for the class on Thursday and please have them at every class meeting. (If you lose these cards then you can print some more from WebCT.)

Aside from class, much of the communication for 3341 is done at WebCT. It is at http://webct6.utdallas.edu/ .

- To use WebCT 6, your browser will have to have Java Runtime Environment on your machine. (You can get it free at http://java.sun.com/j2se/1.4.2/download.html)

- WebCT 6 uses lots of 'pop-ups'. To avoid clicking 'OK' lots of times, you should add webct6.utdallas.edu as a trusted site in your browser.

  - In Windows Internet Explorer, you do this by opening IE
  - Go to Tools → Internet Options → Security.
  - Click on the icon for 'Trusted Sites' and then on the button called 'Sites'.
  - This brings you to a text box where you can enter 'webct6.utdallas.edu'.
  - Click 'Add' and then 'OK'.

You will need a calculator for exams. You only need a 'scientific' one. Graphing calculators etc. are not allowed. You will also need a small ruler for drawing vectors etc.

Course Description

I anticipate that we will cover material on mechanics. [I'll include material on Waves only if time allows.] Please note that 'coverage' of all material is not one of my highest priorities. Please don't expect me to walk you through all the Physics that I think that you'll ever need**. In particular, don't expect me to mention everything needed for any professional exam. (For more on my approach to guiding your learning, please read "approach to teaching & learning" on WebCT.**

Physics has the reputation as a 'hard' subject. It may not be difficult for the reasons that you expect. There will be plenty of facts, equations and techniques to be remembered but I don't think that these are what make the subject difficult. Physics does require you to think about what you are doing and why you are doing it. Some people refer to this as 'critical thinking' and its unfamiliarity may be the most difficult thing about Physics. Be careful also about the way words are used in Physics. Words such as velocity, acceleration, momentum and energy have specialized meanings in

Physics. Confusion often results from a mixture of the 'everyday' usage of these words and the specialized meanings of these words.

Student Learning Objectives/Outcomes

- Students will describe one and two-dimensional motion using motion diagrams
- Students will apply Newton's laws to help describe the effect of a propulsive force on a coupled system (e.g. locomotive pulling train, horse pulling wagon etc.)
- Students will interpret physical data and discuss implications for construction of scientific laws. These include discussion of uniform acceleration and the law of conservation of momentum

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Assignments & Academic Calendar

Your answers to homework questions will be graded on www.masteringphysics.com. If you previously registered at this site, then there is no need to re-register and you can log-in immediately. (Registration lasts for two years.)

If you haven't already registered for this site then either,

- Use your Student Access Kit to register for the site. (This kit is free with a new book with the ISBN 080532187x.)

Or

- Buy access ($44.50 without eBook or $79.50 with eBook). The school is at TX 75080.

In the course of registering, you will need to use the ID for the class. It is PMACALEVEY3341SPRING2008. (More on registering for this site is on WebCT.)

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 linearly over the course of two weeks ($= 336$ hours) to 60%. Many of the questions have random numbers and will differ from those in the book.

Do the homework assignment called "Introduction to Mastering Physics" tonight. There is no credit for doing this assignment. This assignment 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 and the math display function. It also introduces the buttons for submitting answers to parts of questions and whole questions. (Be careful of the button called 'Give Up'. The answer doesn't display if you push this button. Instead of pressing it, ask questions at office hours etc. before the due date.) Unless asked 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.

Please check this website often. Homework assignments will appear after the relevant material has been treated in class or by the textbook. These assignments may not be announced in class. (Solutions to questions will not be posted.) The site invites homework comments. You are welcome to make them but there is no compulsion to make comments and no extra credit is offered for them.

Some sections are explicitly skipped to allow us time to reach other material. These are 2.6, 3.5, 5.5, 8.6, chapters 9, 10, 11 and 12. **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.

Be sure to read the sections that are mentioned in the syllabus before the lecture! Part of your grade depends on the results of reading quizzes! 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 8	0	None	Introduction/Questionnaire/ section 1.5
Thursday Jan 10	1	1.7, 1.8	Vectors
Tuesday Jan 15	2	1.9, 2.1	Unit Vectors; Displacement
Thursday Jan 17	3	2.1, 2.2	Average Velocity, Instantaneous Velocity & Distance-Time graphs;
Tuesday Jan 22	4	2.3, 2.4	Definition of acceleration; "Area" under Velocity-Time graphs; 1-D Kinematic Equations
Thursday Jan 24	5	2.5	Acceleration at turning points;
Tuesday Jan 29	6	3.1, 3.2	Position, velocity and acceleration vectors
Thursday Jan 31	7		Examples
Tuesday Feb 5	8	3.3	Projectiles
Thursday Feb 7	9		**First Midterm Test** – chapters 1 to 3
Tuesday Feb 12	10	4.1 – 4.3	Newton's first two laws
Thursday Feb 14	11	4.4, 4.6	Mass & Weight; Free-body diagrams
Tuesday Feb 19	12	5.1, 5.2	Applying Newton's laws
Thursday Feb 21	13	5.2, 5.3	More applications of Newton's laws; Friction (force)
Tuesday Feb 26	14	3.4, 5.4	Circular Motion
Thursday Feb 28	15	4.5	Newton's third law
Tuesday Mar 4	16		Newton's third law
Thursday Mar 6	17		Newton's third law
Tuesday Mar 11	18		*Enjoy Spring Break*
Thursday Mar 13	19		*Enjoy Spring Break*
Tuesday Mar 18	20	8.1	Impulse & Momentum
Thursday Mar 20	21	8.2	Conservation of Momentum
Tuesday Mar 25	22		Conservation of Momentum
Thursday Mar 27	23	8.3	Inelastic collisions (Skip any reference to 'elastic collisions' for now. We'll think about them later)
Tuesday Apr 1	24	Scalar Product from 1.10, 6.1,	Dot product, Work & Kinetic Energy (Money & energy)

		6.2	
Thursday Apr 3	25		**Second Midterm Test** – chapters treated to date
Tuesday Apr 8	26	6.3, 6.4	Work & Energy with Varying Forces, Power
Thursday Apr 10	27	7.1	Gravitational Potential Energy
Tuesday Apr 15	28	7.2, 7.3, 7.4	Elastic Potential Energy, Conservative Forces, Potential (functions)
Thursday Apr 17	29	7.5, 8.4	Energy Diagrams, elastic collisions
Tuesday Apr 22	30	13.1, 13.2	Describing Oscillation Simple Harmonic Motion (SHM)
Thursday Apr 24	31	13.3, 13.4	Energy in SHM
Tuesday May 6, provisionally at 11:00 am			**Final Exam - Comprehensive** The University decides on the time for final exams. Check it at http://www.utdallas.edu/student/registrar/finals/ just before the exam. Inform the registrar about any conflicts with the times for other exams etc.

Grading Policy

Reading Quizzes	15%
Homework	15%
2 midterm Exams @ 20% each	40%
Final Exam	25%
Intangibles	5%

"Intangibles" include completion of reading quizzes and quality of summaries. (More about summaries is on WebCT.)

A grade scale that I have used in a previous semester is as follows: If x is a numerical grade then,

$x \geq 90$; A+	$65 > x \geq 60$; C+
$90 > x \geq 85$; A	$60 > x \geq 55$; C
$85 > x \geq 80$; A-	$55 > x \geq 50$; C-
$80 > x \geq 75$; B+	$50 > x \geq 45$; D+
$75 > x \geq 70$; B	$45 > x \geq 40$; D
$70 > x \geq 65$; B-	$40 > x \geq 35$; D-
	$35 > x$; F

This is a rough guide and is not absolute.

Course & Instructor Policies

I intend to include a brief (10 minute) reading quiz in most lectures. The reading quizzes do not ask for mastery of the material but you will need to have thought about the section(s) involved and you do need a rough understanding about what is going on. The quizzes 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 & tests. Please write the number of your assigned seat below!!!!

My assigned seat for all reading quizzes & tests is

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Reading quizzes cannot be made up and will be given at random intervals during most classes. **Students must be in their assigned seats for these quizzes**. 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 members of the class by moving around, 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 will rely on the fact that you can read the text even if 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,

- Include a reading quiz in most classes
- 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. (Think **silently**! Some people learn well when they are given a chance to think about something without being disturbed.)
    - I'll ask you to hold up the flash-card giving your answer. (Remember that these answers are un-graded and that one of the cards is a question mark to use if you don't know.) Please participate!
    - I'll ask everyone to convince their neighbor of the correctness of their answer. (Other people learn best when able to talk about something to another person. Look for someone with a different answer to yours. Please listen to their reason for their answer. Remember that the forcefulness of the claim doesn't always correlate well with correctness!) This discussion will take us another minute or two. After that, I'll ask you to hold up a flash card giving your current

answer. (This answer is not graded either.) [I'll skip this step if most of us have answered correctly the first time.]

- I'll talk about 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) in the textbook and do the assignment (or parts of it). **After a topic has been completed, I suggest that you make notes for yourself.** These notes will incorporate information from the book, anything that you have got from the class, examples etc. **This is a chance for you to make the topic make sense to you**! It will help you to study for exams.

I want to lecture in this way because;

- It works!
- 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 because 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 [S.I.] is assigned to the course, then they may offer such sessions too. My advice is to go to them if you can.)

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. 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.

Students must be in their assigned seats and must have either a UTD student card or government ID with them for 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 $3" \times 5"$ index card to any of the tests (and can write on both sides of it). The card 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. Exams can only be made up if I am given adequate written reasons as to why the absence occurred.

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.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written

appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be

penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

These descriptions and timelines are subject to change at the discretion of the Professor.