Course Syllabus

Course Information
(course number, course title, term, any specific section title)
Physics 2421-001 Honors Physics I – Mechanics/Heat Spring 2009
Tuesday, Thursday, Friday 11:30-12:45 PM in FN2.106

Professor Contact Information
(Professor's name, phone number, email, office location, office hours, other information)
Prof. J. M. Izen Office: ECSN 2.512 (972) 883-2598
Office hours: Tues and Thurs 12:45–1:45 PM in ECSN 2.512.
Email: joe@utdallas.edu. I do not read WebCT mail, only regular Internet email.

Teaching Assistant Contact Information
(Professor's name, phone number, email, office location, office hours, other information)
Mr. Masa Kondo Office: ECSN 2.210 (972) 883-2598 Email: masa@utdallas.edu.
Office hour: To be announced in ECSN 2.210.

Course Pre-requisites, Co-requisites, and/or Other Restrictions
(including required prior knowledge or skills)
Prerequisite: MATH 2413 (Differential Calculus) or MATH 2417 (Calculus I).
Corequisite: MATH 2414 (Integral Calculus) or MATH 2418 (Calculus II) and PHYS 2125 (Physics Laboratory I). A thorough mastery of graph-rereading (K-12 level), pre-calculus and calculus prerequisites is expected. Familiarity with the Ideal Gas Law, heat capacity and phase change at the level of high school chemistry is assumed.

Course Description
This class is a more rigorous version of PHYS 2325 with additional topics in analysis of accelerometer measurements and possibly thermal physics. Derivations often handle more general cases and rely more heavily on calculus concepts and use of vectors. More challenging problems and applications. Two lectures plus a required recitation session per week.

Topics: Calculus based. Basic physics including a study of space and time, kinematics, forces, energy and momentum, conservation laws, rotational motion, torques, and harmonic oscillation, and if time permits, kinetic theory of heat, thermodynamics.

Student Learning Objectives/Outcomes

Students will master the derivation and application of the following physical concepts:

- Use of vectors, vector addition, vector subtraction, dot and cross products
- Linear motion: displacement, velocity, acceleration
- The nature of forces
- Newton's Laws of linear motion
- Energy and Potential
- Momentum and Collisions
- Gravitation, Orbits
- Center of mass, motion of rigid bodies
- Angular motion: angle, angular velocity, angular acceleration, angular momentum, torque.
- Static equilibrium
- Harmonic motion
- Wave motion
- Kinetic theory of heat for an ideal gas.

Required Textbooks and Materials

Online HW: Mastering Physics for Young/Freedman, 12th ed., Course ID: PHYS2421IZEN2009 http://www.masteringphysics.com/ support@masteringphysics.com

The Online HW is required. You should have **some** text. The recommended text is: University Physics, Volume 1, 12th edition (paperback), by Young & Freedman or the hardcover version that is the equivalent of paperback Volumes 1, 2, and 3. The content of previous editions of this series, and other calculus-based series for scientists and engineers (Serway, Tipler, Halliday and Resnick…) is essentially equivalent. I will refer to chapters in the recommended text, but if you have an older edition or a different book from an older sibling or a room mate, you should consider using it.

Homework Assignments & Online Course Resources

(Topics, Reading Assignments, Due Dates, Exam Dates)

Online HW may be supplemented with "old-fashioned" problems and accelerator/altimeter vest assignments to be turned in on paper (or emailed to the TA as a pdf). Supplemental problems will be assigned via the course Yahoo®!Group. Students should request a free Yahoo ID from www.yahoo.com if they don't already have one. Please join the group by sending an email to phys2421–subscribe@yahoogroups.com and then follow the instructions in the return email. To unsubscribe your email, use phys2421–unsubscribe@yahoogroups.com. You may choose to read and send postings by email or via the WWW page http://groups.yahoo.com/group/phys2421/. It is your responsibility to register for online HW, to join the Yahoo®!Group and to check the Yahoo and Mastering Physics sites regularly for HW assignments. HW will typically be assigned on Friday evening. Students should typically be prepared to present their solutions in class on Tuesdays, and to complete online HW by 12:01 AM Thursday mornings, and to hand in (email) written assignments at the start of class on Thursday. Deviations from this schedule will be announced in online Mastering Physics assignments and/or via a Yahoo®!Group posting. Your written assignments should be neat, problems should be ordered, and pages should be **stapled**. You may ask any of your classmates for homework hints if you are stuck. In fact, you are **encouraged to do so**, but you may not directly copy someone else's solution, or let someone else complete your online homework. It's OK to ask more advanced students for help, but after you've received help, I expect you to start with a clean sheet and work the problem yourself. Late HW will only be accepted by prior arrangement with the instructor. Classroom presentation of problems will count toward your HW grade. An recitation absence will result in a "zero" if you were selected to present a problem.

The Yahoo®!Group is also intended to be a discussion/question/answer forum for the class. You are expected to keep posts on topic, following commonly accepted practices of netiquette. Abusive posts will be sent to the Dean of Students office for disciplinary action.

Attendance is required in class. Questions based on Classroom discussions and demonstrations will appear on tests. Absence excuses are entirely at instructor's discretion. Expect to provide documentation for medical problems, court appearances, car accidents, and deaths in the family if you wish to have an excuse considered. If you have a conflict with another official university activity, you must let me know at least a week ahead of time. Unexcused absences will result in a grade reduction at the instructor's discretion.

Note taking is an important part of learning. Students are required to turn in a copy of their class notes for the previous week's lectures on Tuesday for grading. Your class notes should include definitions, derivations presented in class plus your annotations describing explanations for key steps, example problems, descriptions of demonstrations and the principles involved. Notes should be legible, stapled, and should include annotation. Grading will be Pass/Fail with one chance to redo an unsatisfactory set of class notes. A transcription of what is written on the whiteboard by itself is not sufficient.

A library electronic reserve password will be distributed in class. Lectures will be recorded and made available to the class online, on demand, on a best-effort, basis with no guarantee of availability. Lectures recordings are copyrighted and are provided at no charged to the class. Recordings may not be duplicated or captured. Redistribution on media or electronically will result in disciplinary and/or legal proceedings.

Texting and cell phone usage in class and during exams is forbidden without the instructor's approval. Reading and sending emails during class is forbidden without the instructor's approval. Use of online resources such as the World Wide Web is narrowly permitted for online text or HW problem access or for delving further into a lecture topic that has been covered during the past five minutes. Tablet PC's and laptops may be used for note-taking so long as students abide by all course policies. This privilege may be withdrawn for individual students or the class, completely at the instructor's discretion.

Grading Policy
(including percentages for assignments, grade scale, etc.)
Individual online HW problems are usually given equal weight and are graded on a 10 point scale. Accelerometer/Altimeter vest homework and Six Flags data-taking and analysis can be carried out individually or within you "vest" group, however the assignments/reports must be written independently. Copying the HW of a class mate is an academic integrity violation that will result in penalties for all involved parties.

Online/written HW will account for 10% of the course grade.
In class presentation of HW problems will account for 5% of the course grade.
Accelerometer/Altimeter vest HW will account for 5% of the course grade.
Class notes will account for 10% of the course grade.
Your Six Flags report will account for 20% of the course grade.
There will be four exams exams; the last exam will be given during Finals period. Your two best exams will each count for 15%. Your two poorest exams will each count for 10%. No test scores will be dropped. Quizzes are not planned, but may be introduced at the instructor's discretion.

Course & Instructor Policies
(make-up exams, extra credit, late work, special assignments, class attendance, classroom citizenship, etc.)

Make-up for missed tests are entirely at the instructor's discretion. Expect to provide documentation for medical problems, court appearances, car accidents, and deaths in the family if you wish to have an excuse considered. If you have a conflict with another official university activity, you must let me know at least a week ahead of time.

Exams and exam solutions that are provided to the class are strictly for personal use. They do not become the property of the student, and they may not be distributed or shared outside the class.

Seeking help from an instructor solution manual or a solution posted on the Internet is not allowed

Cheating on tests and other academic honesty violations will be prosecuted per the UTD Academic Dishonesty policy. My recommended penalty to the UTD Judicial Officer for any violation is likely to be a course grade of F, even for minor infractions. Possession of materials in violation of a copyright will be reported as permissible by law.

Field Trip Policies
Off-campus Instruction and Course Activities

> *Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.*

A required field trip to an amusement park outside of class hours is planned. An alternative assignment may be substituted for students who are unable to participate due to health, disability, religious, scheduling, financial, or other reasons. Prof. Izen is to be alerted 4 weeks in advance if an alternative is required. Students should not go on rides or participate in any activity that they feel would endanger their health.

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).

Please consult Course and Instructor Policies for more specific information pertaining to this course. It is a student's responsibility to seek guidance if a policy or its application to a specific situation is not clear.

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.

Academic Calendar (Tentative)

(Topics, Reading Assignments, Due Dates, Exam Dates)

Class	Day	Date	Chapter	Topics
1	Tu	1/13	1	Introduction, Units, Vectors
2	Th	1/15	2	Velocity, Acceleration, 1-D Motion
3	Fr	1/16	3	2-D and 3-D Motion, Constant Acceleration
4	Tu	1/20	1-3	Discussion Session
5	Th	1/22	4	Newton's Laws
6	Fr	1/23	4	Newton's Laws
7	Tu	1/27	4	Discussion Session
8	Th	1/29	5	Applications of Newton's Laws
9	Fr	1/30	5	Applications of Newton's Laws
10	Tu	2/3	5	Discussion Session
11	Th	2/5	1 - 5	Exam I: (Up to Applications of Newton's Laws)
12	Fr	2/6	6	Work
13	Tu	2/10	6	Discussion Session, Return Exam I
14	Th	2/12	7	Work, Potential Energy
15	Fr	2/13	7	Potential Energy
16	Tu	2/17	6,7	Discussion Session
17	Th	2/19	7	Potential Energy
18	Fr	2/20	12	Gravity
19	Tu	2/24	7,12	Discussion Session
20	Th	2/26	12	Gravity
21	Fr	2/27	8	Momentum, Impulse, Collisions in 1-D
22	Tu	3/3	6,7,12	Discussion Session
23	Th	3/5	6 - 7, 12	Exam II: (Work, Potential, Gravity)
24	Fr	3/6	8	Collisions in 2-D
25	Tu	3/10	8	Discussion Session, Return Exam II
26	Th	3/12	9	Angular Motion
27	Fr	3/13	9	Moment of Inertia (Spring Break: 3/16 – 3/20)
28	Tu	3/24	9	Discussion Session
29	Th	3/26	10	Torque, Rolling,
30	Fr	3/27	10	Angular Momentum
31	Tu	3/31	10	Discussion Session
32	Th	4/2	11	Static Equilibrium
33	Fr	4/3	11, 13	Static Equilibrium, Simple Harmonic Motion
34	Tu	4/7	11, 13	Discussion Session
35	Th	4/9	8-11	Exam III (Collisions, Angular Motion, Angular Momentum, Static Equilibrium)
36	Fr	4/10	15	Waves
37	Tu	4/14	15	Discussion Session, Return Exam III
38	Th	4/16	14	Pressure, Buoyancy
39	Fr	4/17	14,	Buoyancy, Six Flags Plans (Six Flags Trip: 4/18. Rain Date: 4/19)
40	Tu	4/21	14,18	Discussion Session
41	Th	4/23	18	Kinetic Theory of Ideal Gas,
43	Fr	4/24	19	First Law of Thermodynamics, PV Diagrams
44	Tu	4/28	18,19	Discussion Session
45	Th	4/30	19,20	PV Diagrams, Second Law of Thermodynamics, Engines, Refrigerators
46	Fr	5/1	20	Second Law of Thermodynamics, Engines, Refrigerators
			14, 15, 18-20	Exam IV/Final (Simple Harmonic Motion, Waves, Pressure, Thermodynamics)

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