Course	**Conceptual Physics II: Energy in Motion** SCI 5332
Professor	Mary L. Urquhart
Term	Spring 2008
Meetings	Monday evenings (5:30-8:15) in FN 2.306. Some course work will be online.

Professor's Contact Information

Office Phone	972-883-2499
Other Phone	972-883-2496 (main office)
Office Location	FN 3.308F
Email Address	urquhart@utdallas.edu
Office Hours	Mondays 1-2 pm, Tuesdays 3:30-4:30 pm, immediately after class, and by appointment
Other Information	Assignments should be submitted through WebCT, or on paper when necessary. Other correspondence with the instructor should be by regular email.

General Course Information

Pre-requisites, Co-requisites, & other restrictions	Prior physics experience is not required. Course assumes students have an interest, and preferable experience, in pre-college teaching.
Course Description	Designed to enhance both the physics content and pedagogical content knowledge of students the topics covered in this course will parallel those of part of a first year introductory college physics course, but with several important differences. Much of the class will be done workshop style, with hands-on materials available in local districts or demonstrations and experiments that can be done with inexpensive or common materials. Students will also be expected to think critically about both the science content and how topics discussed in the course can relate to instruction in pre-college classrooms. This course will focus on physical science concepts involving properties of matter, behavior of fluids, mechanical waves including sound, and heat, temperature and thermodynamics explored in the context of the everyday world. Building upon classical mechanics (motion, force, energy, and momentum) concepts explored in the first semester, students will explore the behavior of systems of particles. The atom, physical chemistry, light, electricity and magnetism concepts will be more fully integrated into final course of this three-course sequence.
Learning Outcomes	At the completion of this course, the successful student will: • Demonstrate an understanding of the physical science concepts related to motion of objects in the everyday world, including density, states of matter, fluids, waves and sound, and thermodynamics to an 80% level through written responses on quizzes and post-instructional journals. • Show an ability to utilize and critically evaluate hands-on activities that can be used with pre-college students (some of which will use instructional equipment available in local

school districts including probeware and CPO) through instructor-observed performance in small group work and class discussions, written activity reports, and written journals to an 80% level.

- Evaluate the impact of common student misconceptions related to the physics of systems of particles and demonstrate teaching performances for addressing these misconceptions in an instructional context through discussions and peer teaching a lesson with no content errors and attention to common pre-existing mental models.
- Demonstrate an awareness of the application of course content to the Texas Essential Knowledge and Skills (TEKS) through matching appropriate all appropriate physical science TEKS to assignments dealing with instruction at a specific grade level and through vertical alignment exercises.
- Demonstrate an awareness and understanding of physics in the everyday world through discussions and through completion of small projects to within 80% of possible points in the rubric.
- Create a teaching tool kit from both resources used in the course and those available from other sources including the Internet as demonstrated through a course portfolio achieving at least 80% of possible points in the portfolio rubric.

Required Texts & Materials

- You will not be required to use a specific textbook
- A scientific calculator will be useful in most, if not all, class meetings. Please bring yours to each class session.
- Access to a computer and the Internet outside of class.

Suggested Texts, Readings, & Materials

Three texts are recommended depending upon your own comfort level with mathematics and the subjected material. Limited copies are available for checkout from your professor.

1. Conceptual Physics (Paul Hewitt) is a high school conceptually-based physics text. Several Teacher Editions are available for checkout.
2. Conceptual Physics (Paul Hewitt) college edition.
3. Physics (James Walker, 2nd Edition) is an excellent algebra-based physics textbook for those students preferring a more mathematical approach. ISBN: 0-13-101416-1

We will frequently use physicsclassroom.com and hyperphysics as an online physics textbooks.

Assignments & Academic Calendar

[Topics, Reading Assignments, Due Dates, Exam Dates]

January 7	1. Introduction and Review Start of Density
January 14	2. Density

	States of Matter
January 21	University Holiday
January 28	3. Fluids, Part 1
February 4	4. Fluids, Part 2
February 11	5. Oscillations and Waves
February 18	6. Waves
February 25	7. Waves and Sound
March 3	8. Sound, part 2
March 10	Spring Break
March 17	TBD
March 24	9. Energy Transformations
March 31	10. Temperature and Heat (temperature scales, thermal expansion and contraction, heat capacity, heat transfer)
April 7	11. Heat and Matter
April 14	12. Thermodynamics
April 21	13. Bringing it Together
April 28	14. Thermal energy in Chemical Reactions (Portfolios Due)
Exams	Weekly post-journals will serve as mini-exams. Our final exam period will be used for student lesson presentations.

Course Policies

Grading (credit) Criteria	**Pre-Journals, Class Discussions, and Group Work** (10%): Much of the class will be done in the style of an educator workshop. You will be expected to be an active participant in all activities and in discussions and contribute to the learning environment for your classmates. The quality of your contributions and the evidence of deep thinking and development of understanding will be part of this grade. **Post-Journals** (30%): Post-journals should be considered mini-exams and will be used to determine your understanding of content. They may be given in class or through WebCT. **Small Projects** (15%): A small project is generally an experiment you will conduct on your own. These projects are not meant intended to be extremely time consuming but to extend your learning beyond the classroom setting. Examples of small projects: • Ice sink or float • Sound investigations • Amusement park/playground physics. **Weekiy Quizzes** (30%): Every class meeting, one or more thought questions or simple problems will be asked of the class to probe each student's understanding of the topics discussed. Answers to the journal questions must be in your own words, and when mathematical, you must show your work. Questions may take home or given in class. All quizzes will be graded on a 10 point scale:

Content:

4 point: Excellent. Complete, correct and clear. Little or no corrections are necessary.

3 points: Good. Minor problems with the answer in content, completeness, or clarity.

2 points: Fair. Requires at least one major correction or revision. Consider redoing the quiz.

1 point: Poor. Serious flaws in the answer. Turning in a redo of the quiz is strongly recommended.

0 points: Did not address the question asked**.** Please try again.

Thoroughness (not length!):

4 point: Excellent. Answer is thorough and demonstrates the student has thought deeply about the question.

3 points: Good. Answer is acceptable and demonstrates a reasonable amount of thought about the question.

2 points: Fair Answer is not thorough.

1 point: Poor. . Answer does not demonstrate sufficient thought or effort.

0 points: Did not address the question asked**.** Please try again.

Other:

1 point: Readability: Answer is clear, legible understandable, and does not ramble.

1 point: References are given when necessary and are accurate.

Note: these quizzes are generally given in place of exams. An initial grade of 50% or less on three or more quizzes may result in you being required to take a final exam.

Peer Teaching and Portfolio (15%): Throughout the course you will be creating a portfolio of resources that can be used in future teaching. Your portfolio will be required to include an original lesson plan using the 5 E model. You will have the option of either peer teaching the lesson during the semester or describing the lesson to the class in an oral presentation at the end of the course.

Revisions: Whenever reasonable, you may redo take-home quizzes, post-journals, and small projects to **earn back up to half** of your missed points, unless otherwise stated by the professor. Such revisions must be submitted in a timely manner, and will be held to the same standards as the original assignment. We will discuss assignments, including quiz questions, in class. Revisions must demonstrate an individual understanding of the material

	rather than a summary of the class discussion. If a redo of your portfolio is necessary, it may result in a grade of incomplete in the course.
Make-up Exams	**By arrangement with the professor**
Extra Credit	**NA**
Late Work	**Accepted only at the discretion of the professor**
Special Assignments	**If you need special arrangements, talk with the instructor as soon as possible.**
Class Attendance	**Attendance of all classes! You *must* get all absences excused by the professor, in advance if possible.**
Classroom Citizenship	**This is a graduate class and students are expected to behave accordingly. Your presence should enhance rather than detract from the learning of your classmates. Your classroom citizenship is part of your participation grade.**
Student Conduct and 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 Grades	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.
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 http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean.

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