Department of Physics/Astronomy, Trent University
PHYS-FRSC 1020H *Forensic Physics*: 2011-2012 FA
Peterborough Campus

1 Course Information

Prerequisite: 4U Advanced Functions or equivalent, or permission of the instructor.
Recommended: 4U Physics and 4U Calculus and Vectors.

1.1 Course Objectives

- to build an understanding of the fundamental principles underlying physical phenomena,
- to develop the ability to describe these phenomena verbally and mathematically,
- to develop analytical skills applicable to a wide range of situations both within and outside physics,
- to provide a foundation for further study in physics.

1.2 Teaching Approach

This course takes an interactive approach to learning. Course notes are provided in addition to the text, and students study assigned sections before each class. Class time is spent mostly in small group discussions of conceptual problems, followed by a vote on the correct answer, using electronic *clickers*. This provides instant feedback to students on their progress, and allows misunderstandings to be corrected quickly. See *Course Components* below for more details.

1.3 Course Description and Topics Covered

Mechanics (Kinematics, Translational Dynamics, Work and Energy, Rotational Dynamics, Simple Harmonic Motion); Gravitation; Fluids; Elasticity; Temperature and Materials.

2 Instructors' Information

	Lecturer	**Lab Demonstrator**
Name	Ralph Shiell	TBD
Email	ralphshiell@trentu.ca	
Phone	(705) 748-1011 x7023	
Office Location	SC 214 (Science complex)	
Office hours	TBD	

Secretary: Gina Collins, gcollins@trentu.ca, 748-1011 x7715, SC 327 Physics Building

3 Course Format

Classes: SC137 Monday 15:00-15:50; Wednesday 16:00 – 16:50; Friday 10:00-10:50
Labs/tutorials: SC305 Tuesday or Wednesday; 17:00-19:50

4 Required Text and Course Materials

Printed class notes: These are the primary readings for the course. They will be distributed in class.
Textbook: **Physics for Scientists and Engineers**, R.D. Knight, 2nd edition. This is an excellent text, developed from recent research on physics teaching. Use it to clarify points in the notes, and for supplemental readings, worked examples and assigned problems.
Student Workbook, by R. D. Knight. This comes with the text, if you buy it new. Otherwise, it can be purchased separately.
Voting clicker: This device, also purchased through the Bookstore, will enable you to reply electronically to

questions asked during class, and is required. We anticipate a resale market for the clickers at the end of the year. The same clicker will work in all courses using them. Register on-line as an mls (myLearningSystem) quiz, as explained below.

Lab manual and materials: These will be distributed in the first lab session. *Note*: There will be $10 charge (cash) collected in the first lab/tutorial session to cover the cost of the printed class notes, lab manuals and materials.

5 Course Components

5.1 Pre-class readings

Before each class students are assigned readings from the printed class notes (see the documents *Course Schedule*, and *Assigned Readings*, for detailed information about these). There will be a short quiz on the reading to be done on mls before each class. To do a quiz, sign on to mls <http://www.trentu.ca/mls> and click on PHYS-1001H. From there, go to Assessments and select the appropriate reading assignment. The goal is to give an introduction to the material which will be discussed in the class. At this point some familiarity with the content is expected, but in-depth knowledge is not.

5.2 Classes

These consist mostly of interactive discussions based on the pre-class readings. First, the instructor will briefly review the main points of the pre-class readings. Then, students will use "clickers" to answer questions illustrating key concepts. Students will have a chance to discuss the questions with their classmates and ask questions at this stage. The physics being studied will also be clarified using equipment demonstrations.

5.3 Problem sets

Roughly every two weeks, a set of problems will be assigned and should be completed using either pencil or blue/black ink. Two of these problems will be randomly chosen at the following tutorial approximately two weeks later; one will be self-marked using a red pen and then be handed in, and one will be given as a closed-book quiz. Two of the in-class "clicker" questions from the previous two weeks will also be graded in the closed-book quiz. The remaining assigned problems will not be graded, although the complete solutions will be later posted in SC322. Students are expected to have completed and understood the assignment problems before the tutorials. Help with the assignments is available during **physics help sessions**, or during your instructor's office hours. The problem sets are extremely important preparation for the mid-term test and final exam.

5.4 Tutorials

Tutorials are held every two weeks, and alternate with the laboratory sessions described below. After a Math assessment shortly after the start of the semester, they will then consist of (i) the self-marked problem and closed-book quiz discussed above, (ii) a set of conceptual problems taken from the Knight Workbook, and (iii) several numerical problems. The problems in (ii) and (iii) are solved with the help of your classmates and the lab Tutors, to help you understand the assigned problems that you must master before the next tutorial. Before leaving the tutorials, you must show your work to one of the Tutors, who will assign you a participation grade based on your effort. You will receive the maximum participation grade if you made a reasonable attempt at all the questions, **or** if you worked diligently for at least 2 h of the 3-h session during this time. Otherwise you will receive zero.

5.5 Laboratories

There will be a 3-hour laboratory, roughly every two weeks. In each laboratory, students will work in pairs (occasionally threes) to carry out an experiment as described in the lab manual. Individual written lab reports will then be prepared. The goal is to give students hands-on experience with physical concepts, an opportunity to work with laboratory instruments, and practice developing written communication skills.

5.6 Tests and exams

There will be a mid-term test on specific sections of the course material, and a final exam covering the whole course.

6 Course Evaluation

Pre-class mls quizzes	5%	(every class)
Clicker participation in class	5%	(every class)
Tutorial participation	5%	(~fortnightly)
Problem sets (self-marked problems & quizzes)	15%	(~fortnightly)
Laboratory	20%	(~fortnightly)
Mid-term test	15%	Week 7 or 8
Final Exam	35%	Fall Final Exam period
Total	100%	

Note: Regardless of the overall grade calculated above, an overall average of at least 35% on the mid-term test and final exam, weighted as above, must be obtained in order to pass this course. Otherwise, a grade of no more than 45% (i.e. an F) will be assigned.

Clicker participation: For clicker voting, described above under *Classes*, you will receive 10 "points" for any class in which you participate in at least 75% of the votes, and an additional 0.5 point for every question answered correctly. If you answer less than 75% of the questions you will receive zero. These scores will be averaged to give the "clicker" mark out of 5%. Your four lowest scores will be dropped before the final grade is calculated, to allow for weak batteries, equipment malfunction, etc. Use ONLY your own clicker – it is dishonest to use anyone else's, and the computer will not assign you the marks for voting.

Pre-class mls quizzes: The quizzes must be completed before each class. The deadline for completing each quiz is 8:00 am on the day of the class. For each question, full credit is given for the correct answer and half credit is given for an incorrect answer. Your four lowest quiz marks will be dropped, to allow for equipment malfunctions, etc.

Answering the pre-class reading quizzes

1. Log onto your mls account at www.trentu.ca/mls. Instructions are given there for obtaining your Trent username and ID, if you do not already know them.

2. Click on " PHYS-1001H -1020H".

3. Click on "Assessments" at the left of the page.

4. Click on the desired quiz title (this will normally be the page numbers from the notes that are assigned as the reading) and then click "Begin Assessment".

5. You can answer the equations immediately, or hit Ctrl-P to print yourself a paper copy of the quiz to use while you are reading the notes.

6. To answer the questions, either click on the box corresponding to the answer you prefer, or write a "Short answer" as appropriate. To save this answer, click on "Save answer". This will save the answer to keep you from losing it if there are technical problems, but you can return and change it if you want. The box on the right side of the screen keeps track of the questions that have been answered. When you are satisfied with all the answers to the questions, click on the "Finish" button. This will release your answers to be graded. YOU CANNOT CHANGE ANY ANSWERS AFTER THIS POINT.

7. Your answers will be graded and the results released after the closing time for the quiz. You can see your results by clicking the "My Grades" button under "My Tools" at the left of the mls page. You'll also see either the average class score or a **View Statistics** button that lets you see detailed statistics.

8. Closing your browser will automatically log you out of mls. You should always log out of your Novell account as well, if you are working on a computer on campus, so others can't access your files.

7. Late Policy

Late lab reports will lose 10% per day late without a valid excuse with documentation acceptable to the instructor (e.g., doctor's statement). Labs missed due to documented illness may be made up at the discretion of the Lab Demonstrator. If the Lab Demonstrator is unable to provide an alternative time, the labs which are completed will be prrated to provide the laboratory grade.

8. Academic Integrity

Academic dishonesty, which includes plagiarism and cheating, is an extremely serious academic offence and carries penalties varying from a 0 grade on an assignment to expulsion from the University. Definitions, penalties, and procedures for dealing with plagiarism and cheating are set out in Trent University's Academic Integrity Policy. You have a responsibility to educate yourself – unfamiliarity with the policy is not an excuse. You are strongly encouraged to visit Trent's Academic Integrity website to learn more: www.trentu.ca/academicintegrity. For the interpretation of academic integrity for students in the Physics/Astronomy Department, see http://www.trentu.ca/physics/current_integrity.php .

9 Access to Instruction

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and/or health consideration and feels that he/she may need accommodations to succeed in this course, the student should contact the Disability Services Office (BH Suite 132, 748-1281, disabilityservices@trentu.ca) as soon as possible. Complete text can be found under Access to Instruction in the Academic Calendar.

10 Clicker (Personal Response Systems) Policy

As clicker records are used in this course to compute a portion of course grades, the use of a clicker other than your own is an academic offence. In a lecture or tutorial, possession of more than one clicker, or that of another student, may be interpreted as intent to commit an academic offence.