

**DEPARTMENT OF PHYSICS AND ASTRONOMY
TRENT UNIVERSITY**

**PHYS 2090Y: PHYSICAL SCIENCE FOR TEACHER EDUCATION
2014-15 FW
PETERBOROUGH**

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Course Description: This is a hands-on, lab course designed to meet the needs of future elementary school teachers. We meet for a three hour session each class. We cover selected topics taken from, or related to, the Ontario Curriculum for grades 1-8 where basic concepts are often misunderstood; these may be taken from Light, Electricity, Motion, and Forces. Students will work with their classmates to investigate physical systems and develop their own models to explain how they work, and refine those models through guided activities and group and classroom discussions.

Course Pre-requisites: None. Students majoring in a physical science or maths are excluded. It is assumed that all students plan to become elementary school teachers.

Course Fees: \$35 printing and lab resources fee. Make cheques payable to “Trent Univeristy Department of Physics and Astronomy”. If you need a receipt, attach a note to your payment with your name, Trent email address, and student number.

Required Texts: (Provided in class upon payment of fee)

Title: *Powerful Ideas in Physical Science*
 Author: American Association of Physics Teachers

MyLearningSystem: Online resources are available including audio/video files, review exercises, class discussion forums, course calendar, and online assignment submissions. Access to this system is required for some aspects of the course. Some material may also be available at <http://www.trentu.ca/physics/jbeda/PHYS2090Y/>

Course Format:

Please check <http://www.trentu.ca/admin/mytrent/AcademicTimetable.htm> to confirm times and locations.

Type	Day	Time	Location
Lab Section A	Monday	13:00 -16:00	SC 305

Learning Outcomes/Objectives/Goals/Expectations:

Course activities have been developed to address several learning outcomes. By the end of the course a successful student should:

1. Be familiar with the models of physical systems constructed and refined through the course activities.
2. Be able to articulate the features of these physical models, and the evidence that supports their validity, as well as the evidence against other less useful models.
3. Be able to participate in group discussions to develop physical models through sharing ideas and experiences. Be able to analyze others' ideas and experiences and modify their own ideas in light of new evidence and/or understanding.
4. Have increased confidence in their ability to learn, understand, and explain physics concepts at the primary school level.
5. Be familiar with methods of discovery based learning, and have experiences that could serve as models for future classrooms that the student may be a part of.
6. Have enjoyed their time in the class and have felt it was a worthwhile experience.

Course Evaluation:

Course activities include: daily hands-on lab exercises, worksheets and classroom participation; daily homework assignments; daily personal journal entries; essay style assignments; three quizzes; and a final exam.

Note: departmental policy requires that a minimum of 35% must be obtained on the quiz and final exam components to pass this course. If not, a course grade of 45% is the maximum that can be assigned.

Detailed weightings to be decided by the class after the start of the course. The following is approximately what previous classes have decided upon:

Type of	Approximate Weighting (in previous classes)	Due Date
Labs (drop lowest)	1/4 = 25.00 %	in class, that day
Homework (drop lowest)	1/8 = 12.50 %	in class, next class
Journals	1/16 = 6.25 %	in class, that day
Assignments (three)	1/4 = 25.00 %	approx Oct, Feb, March
Quizzes (three)	1/8 = 12.50 %	approx Dec, March, April
Final Exam	3/16 = 18.75 %	exam period in April
Total	1 = 100.00 %	

The mid-course grade (which does not impact the final grade) will be calculated based on the weightings of all graded materials up to that point, converted to a percentage. Thus, for seven homework assignments, seven labs, one assignment and one quiz available for the calculation, the weightings as above would give a score as follows:

25.0 x (7/15) - Labs
 12.5 x (7/15) - Homework
 25.0 x (1/3) - Assignments
 12.5 x (1/3) - Quiz

 30.0 - Total

Department and/or Course Policies:

Departmental policy requires that a minimum of 35% must be obtained on the quiz and final exam components to pass this course. If not, a course grade of 45% is the maximum that can be assigned.

Due to the nature of the course activities, group work, and equipment and space limitations, there are no simple ways to make up for missed in-class activities - attendance at and participation in all classes is required to complete the course material.

Assignments are submitted the initial time for peer editing, returned by the peer editor to the author the next class and then submitted a final time the following class for grading by the instructor. Late initial submissions may not be accepted since a peer editor may not be available and thus the author may lose the opportunity to do peer editing of someone else's work and thus the marks for that portion of the assignment (15% of the assignment total). Late or non return of the author's paper by the peer editor will result in the peer editor being penalized 200% of the grade for the editing portion of the assignment (2 x 15% = 30% of the assignment total). A penalty of 20% per day will be applied to a late Final Submission of the assignment.

A penalty of 20% per day may be applied to a late submission or any other graded component of the course.

University Policies

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: <http://www.trentu.ca/academicintegrity/> .

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.

Safe Assignment:

Assignments/Essays/Paper must be submitted electronically to the SafeAssign drop box in MyLearningSystem. SafeAssign utilizes plagiarism-checking software. Further information about SafeAssign will be provided on the class MyLearningSystem site.

Week-by-week schedule:

See the online calendar tool of *MyLearningSystem* for up-to-date scheduling information. The general schedule we will follow, subject to modifications as the class progresses, will be:

Fall Semester:

Week 1 09/08	Introductory exercises Start Lab L1
Week 2 09/15	Finish Lab L1 Start Lab L2
Week 3 09/22	Finish Lab L2
Week 4 09/29	Start Lab L3 Assignment 1 Initial Due Date
Week 5 10/06	Finish Lab L3 Start Lab L4 Assignment 1 Peer Editing Due
Week 6 10/13	Thanksgiving Assignment 1 Final Due Date
Week 7 10/20	Finish Lab L4 Start Lab L5
Fall Reading Week 10/20 - 10/24	
Week 8 11/03	Finish Lab L5 Start Lab L6
Week 9 11/10	Finish Lab L6 Start Lab L7
Week 10 11/17	Finish Lab L7
Week 11 11/24	Start Lab E1
Week 12 12/01	Quiz 1 - Light Finish Lab E1

Spring Semester:

Week 13 01/12	Start Lab E2
Week 14 01/19	Finish Lab E2 Start Lab E3
Week 15 01/26	Finish Lab E3 Assignment 2 Initial Due Date
Week 16 02/02	Start Lab E4 Assignment 2 Peer Editing Due
Week 17 02/09	Finish Lab E4, Start Lab E5 Assignment 2 Final Due Date
Spring Reading Week 02/16 - 02-20	
Week 18 02/23	Finish Lab E5 Start Lab Ma1
Week 19 03/02	Finish Lab Ma1 Start Lab Ma2
Week 20 03/09	Quiz 2 - Electricity Start Lab Ma2
Week 21 03/16	Finish Lab Ma2 Assignment 3 Initial Due Date
Week 22 03/23	Start Lab Ma3 Assignment 3 Peer Editing Due
Week 23 03/30	Finish Lab Ma3 Assignment 3 Final Due Date Review
Week 24 04/06	Quiz 3 - Levers, Pulleys, Gears Review

Winter Break

Final Exam, return of all graded materials