Department of Physics and Astronomy
Trent University

PHYS 2093H: Physical Science for Teacher Education: Electricity and Motion
2016WI
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. Primary topics will include simple circuit and circuit elements, static electricity, forces, pulleys, levers, and gears. 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: $ 20 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/PHYS2093H/

Course Format:

Please check http://www.trentu.ca/timetable/ 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 in the course.
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 intuitive but less useful models.
3. be able to participate in group discussions to develop physical models through sharing ideas and experiences.
4. be able to analyze others' ideas/experiences and modify their own ideas in light of new evidence and/or understanding.
5. have increased confidence in their ability to learn, understand, and explain physics concepts at the primary school level.
6. 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.
7. be familiar with the models of physical systems constructed and refined through the course activities.
8. 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; A quiz; 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 were decided by the class after the start of the course.

Type of	Approximate Weighting	Due Date
Labs	44 %	in class, that day
Homework	10 %	in class, next class
Journals + Participation	6 % + 2 %	in class, that day
Assignments (two)	22 %	approx weeks 4/5 & 10/11
Quiz	6 %	approx week 7-8
Final Exam	10 %	exam period in April
Total	100 %	

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 may be applied to a late Final Submission of the assignment.

A penalty of 20% per day may be applied to a late submission of 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 , 705-q748-1281, accessibilityservices@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	Introductory exercises
01/11	Start Lab E1 - What is it?
Week 2	Finish Lab E1 - What is it?
01/18	Start Lab E2 - "Obstacleness and Oomph"
Week 3	Finish Lab E2 - "Obstacleness and Oomph"
01/25	Assignment 1 Initial Due Date
Week 4	Start Lab E3 - Electric Charges and Electric Currents
02/01	Assignment 1 Peer Editing Due Date
Week 5	Start Lab E4 - Capacitors in a Circuit
02/08	Assignment 1 Final Due Date

Spring Reading Week
02/15 - 02/19

Week 6	Finish Lab E4 - Capacitors in a Circuit
02/22	Start Lab E5 - Parallel Circuits
Week 7	Finish Lab E5 - Parallel Circuits
02/29	
Week 8	Quiz
03/07	Start Lab Ma1 - Pulleys
Week 9	Finish Lab Ma1 - Pulleys
03/14	Assignment 2 Initial Due Date
Week 10	Start Lab Ma2 - Levers
03/21	Assignment 2 Peer Editing Due Date
Week 11	Finish Lab Ma2 - Levers
03/28	Assignment 2 Final Due Date
Week 12	Finish Lab Ma3 - Gears
04/04	

Final Exam, return of all graded materials