



PHYS-EDUC-2093H-A: Physical Science for Teacher Education: Electricity and Motion 2021WI - Peterborough Campus

Instructor:

Instructor: Johann Beda

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Phone Number: 705-748-1011 x7279

Office: SC 318 or SC 305

Office Hours: Wednesdays 9AM in person in SC318, or by appointment via Zoom.

Meeting Times:

Please check <http://www.trentu.ca/timetable/> to confirm times and locations.

Type: Lab Section PHYS-2091H-A-F01

Day: Wednesday

Time: 11:00 to 13:50

Location: SC 305 and SC 317

Co-instructors and Teaching Assistants:

To be announced.

Department:

Academic Administrative Assistant: Colleen Berrigan

Email Address: physics@trentu.ca

Phone Number: 7715

Office: SC327

Description:

This is an in-person, 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, develop their own models to explain how they work, and refine those models through guided activities and group and classroom discussions.

Learning Outcomes:

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 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. have enjoyed their time in the class and have felt it was a worthwhile experience.
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Course Fees:

A \$20 printing and lab resources fee is due by the second class. Make cheques payable to *Trent University Department of Physics and Astronomy*. You may [eTransfer](#) the fee to the instructor at jbeda@trentu.ca. Use your student number as the "secret code" and be sure to indicate your Trent email address. If you need a receipt for the fee, include a note with your payment with your name and Trent email address.

Texts:

(Provided in class upon payment of fee)

Title: *Powerful Ideas in Physical Science*

Author: American Association of Physics Teachers

Assessments, Assignments and Tests:

Course activities include: weekly in-person, hands-on lab exercises done in small groups; worksheets to develop and record new knowledge; weekly homework assignments to provide practice using newly explored ideas and skills; weekly personal journal entries exploring ideas about science, education and society; two short written assignments/projects on topics relevant to the course; a mid-course quiz covering topics investigated in the first four labs of the course; and a comprehensive final exam covering all details of the course. See [myLearningSystem/Blackboard](#) for detailed lab, assignment, quiz, and exam information.

Grading:

Course Evaluation:

In order to maximize student engagement in all aspects of the course, while remaining consistent with Trent's Undergraduate Calendar, the detailed weightings of the aspects of the course grades **will be decided by the entire class** after the start of the course. As required, the class decision will be posted in a revised syllabus when it has been finalized. The following is approximately what previous classes have decided upon:

Approximate previous years' Grade Weightings

Type of activity	Approximate Weighting (in previous classes)	Due Date
Labs (drop lowest score)	33.16 %	- in class, that day
Homework (drop lowest score)	12.56 %	- in class, next class
Journals + Participation	7.00 % + 2.50 %	- in class, that day
Assignments (two)	19.97 %	- approx weeks 4/5 & 10/11
Quiz	11.13 %	- approx week 6-7
Final Exam	13.69 %	- April exam period
Total	100.00 %	- end of course

Grade Total by Withdrawal Date:

The final date for withdrawal from Winter term courses is Monday, March 15, in Week 09. By this time students should have completed at least five out of eight Lab and Homework assignments, making up about 28% of all graded material, in addition to one of the two written assignments, making up about another 10% of all graded material. Thus, students should have about 38% of their graded material completed and returned to them as of this date, well in excess of the required 25% of material.

Schedule:

See the online calendar tool of [myLearningSystem/Blackboard](#) for up-to-date scheduling information. The general schedule we will follow, subject to modifications as the class progresses, will be:

Week-by-week Schedule

Week number	Date	Activity
Week 01	01/13	Introductory exercises Start Lab E1 - <i>What is it?</i>
Week 02	01/20	Finish Lab E1 - <i>What is it?</i> Start Lab E2 - <i>Obstacleness and Oomph</i>
Week 03	01/27	Finish Lab E2 - <i>Obstacleness and Oomph</i> Assignment 1 Initial Due Date
Week 04	02/03	Start Lab E3 - <i>Electric Charges and Electric Currents</i> Assignment 1 Peer Editing Due Date
Week 05	02/10	Lab E4 - <i>Capacitors in a Circuit</i> Assignment 1 Final Due Date
Spring Reading Week	02/15 - 02/19	Spring Reading Week
Week 06	02/24	Lab E5 - <i>Parallel Circuits</i>
Week 07	03/03	Review Start Lab Ma1 - <i>Pulleys</i>
Week 08	03/10	Quiz Finish Lab Ma1 - <i>Pulleys</i>
Week 09	03/17	Lab Ma2 - <i>Levers</i> Assignment 2 Initial Due Date
Week 10	03/24	Start Lab Ma3 - <i>Gears</i> Assignment 2 Peer Editing Due Date
Week 11	03/31	Finish Lab Ma3 - <i>Gears</i> Assignment 2 Final Due Date
Week 12	04/07	Finish any lab activities Student Led Review
Final Exam	Exam period - April 12-23	Final Exam return of all graded materials

Course Guidelines:

myLearningSystem/Blackboard:

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. Links to [myLearningSystem/Blackboard](#) and other material are

available at <http://www.trentu.ca/academic/physics/jbeda/PHYS209x/>

Safe Assignment:

Assignments/Essays/Paper must be submitted electronically to the SafeAssign drop box in LearningSystem/Blackboard. SafeAssign uses plagiarism-checking software. Further information about SafeAssign will be provided on the class [myLearningSystem/Blackboard](#) site.

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 ($2 \times 15\% = 30\%$ 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 failure 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.

Access to Instruction

It is Trent University's intent to create an inclusive learning environment. If a student has a disability and documentation from a regulated health care practitioner and feels that they may need accommodations to succeed in a course, the student should contact the Student Accessibility Services Office (SAS) at the respective campus as soon as possible.

Sharing and Distribution of Course Content

Students in this class should be aware that classroom activities (lecture, seminars, labs, etc.) may be recorded for teaching and learning purposes. Any students with concerns about being recorded in a classroom context should speak with their professor. If a student shares or distributes course content in any way that breaches copyright legislation, privacy legislation, and/or this policy, the student will be subject to disciplinary actions under the Student Charter of Rights and Responsibilities or the relevant Academic Integrity Policy, at a minimum, and may be subject to legal consequences that are outside of the responsibility of the university. More details on sharing of course content are described in the policy found here: <https://www.trentu.ca/artsci/sites/trentu.ca.artsci/files/documents/Policy%20on%20Sharing%20and%20Distribution%20of%20Course%20Content%202020-08-14.pdf>

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