PHYS-EDUC-2091H-A: Physical Science for Teacher Education: Light and Colour
2026WI - Peterborough Campus

Instructor:

Instructor: Johann Beda

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Phone Number: 705-748-1011 x7279

Office: SC 318 or SC 305

Office Hours: By Appointment or after class

Meeting Times:

Please check the timetable on myTrent to confirm times and locations.
Type: Lab Section PHYS-2091H-A-W01
Day: Friday
Time: 09:00 to 11:50
Location: SC 305

Co-instructors and Teaching Assistants:

To be announced.

Department:

Academic Administrative Assistant: Colleen Berrigan

Email Address: physics@trentu.ca

Phone Number: 705-748-1011 ext.7715

Office: SC327

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 light, image formation, colour perception, reflection, refraction, shadows, and printing. 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.

Course Fees:

A printing and lab resources fee of $30 plus tax will be charged to each student's account.

Texts:

(Provided in class)
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)	34.02 %	- in class, that day
Homework (drop lowest score)	12.05 %	- in class, next class
Journals + Participation	7.00 % + 2.43 %	- in class, that day
Assignments (two)	20.40 %	- approx weeks 3-5 & 9-11
Quiz	10.33 %	- approx week 7-8
Final Exam	13.76 %	-April exam period
Total	100.00 %	- end of course

Grade Total by Withdrawal Date:

The final date for withdrawal from Winter term courses is Tuesday March 10 2026, in Week 08. 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 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	01/09	Introductory exercises Start Lab L1 - *Light and Illumination*
Week 02	01/16	Finish Lab L1 - *Light and Illumination* Start Lab L2 - *Mirrors and Reflection*
Week 03	01/23	Finish Lab L2 - *Mirrors and Reflection* Assignment 1 Initial Due Date
Week 04	01/30	Start Lab L3 - *Refraction and Real Images* Assignment 1 Peer Editing Due Date
Week 05	02/06	Finish Lab L3 - *Refraction and Real Images* Assignment 1 Final Due Date
Week 06	02/13	Start Lab L4 - *The Eye*
Reading Week	02/17 - 02/21	Spring Reading Week
Week 07	02/27	Finish Lab L4 - *The Eye* Start Lab L5 - *Seeing Images*
Week 08	03/06	Quiz - including Lab L4 Finish Lab L5 - *Seeing Images*
Week 09	03/13	Start Lab L6 - *Colour Addition, Colour Vision, Colour Technology* Assignment 2 Initial Due Date
Week 10	03/20	Finish Lab L6 - *Colour Addition, Colour Vision, Colour Technology* Start Lab L7 - *Colour Absorption and Colour Filters* Assignment 2 Peer Editing Due Date
Week 11	03/27	Finish Lab L7 - *Colour Absorption and Colour Filters* Assignment 2 Final Due Date Finish any lab activities Student Led Review
Week 12	04/03	Good Friday Holiday - No classes
Final Exam	exam period	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.beda.ca/johann/trentu/PHYS209x/

Safe Assignment:

Assignments/Essays/Paper must be submitted electronically to the SafeAssign drop box in myLearningSystem/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 so 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 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 relevant Academic Integrity Policy, the Charter of Student Rights & Responsibilities, or the Policy on the Protection of Personal Information, at a minimum, and may be subject to legal consequences that are outside of the responsibility of the university.

Student Absenteeism, Missed Tests and Examinations

Students are responsible for completing all course requirements, including attending classes and meeting assignment deadlines as specified on their syllabus.

Adjustments and deferrals to dates for participation, assignment submissions, tests, midterms and final examinations are not automatic. It is the student's responsibility to email their instructor immediately if they are unable to fulfill academic requirements.

Courses delivered remotely may involve student participation in scheduled (synchronous) classes via web-based platforms, such as Zoom. Students unable to participate (i.e., by video and/or audio) should email their instructors to request alternative arrangements for participation in these scheduled (synchronous) classes.

Students are required to be available for all tests, midterms and exams that are listed in their course syllabus and scheduled by their instructor or the Office of the Registrar. Depending on their program, the instructor or the chair/director may decide on alternative arrangements for exams and tests. Normally a doctor's note or supporting documentation is not required; however, when a student's success in the course or program is in jeopardy as determined by the instructor or chair/director, documentation may be requested.

Specific SAS accommodations can be implemented for students registered with Student Accessibility Services (SAS), but it is the responsibility of the student to make these arrangements in advance as per SAS guidelines, and to discuss accommodations of due dates with their instructors.

Students can notify the Office of the Registrar of their wish to observe cultural or religious holidays during scheduled examination periods by the deadline set in the Academic Calendar. Personal travel plans are not acceptable reasons for missing tests or exams.

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