

PHYSICS
Science
Waves, Optics & Modern Physics
203-NYC-05 (all sections)
Fall 2018

Teachers	Nadim Boukhira 7A.20, local 4018, nboukhira@dawsoncollege.qc.ca Paul Duarte 7A.18, local 4015, pduarte@dawsoncollege.qc.ca Vladimir Feshchenko 7A.8, local 4025, vfeshchenko@dawsoncollege.qc.ca Samad Rastikerdar 7A.22, local 4020, srastikerdar@dawsoncollege.qc.ca Jaime Sandoval 7A.18, local 4016, jsandoval@dawsoncollege.qc.ca Joel Trudeau 7A.20, local 4019, jtrudeau@dawsoncollege.qc.ca Helene Gaonac'h 7A.16, local 4902, hgaonach@dawsoncollege.qc.ca (Cont'Ed)
Pre-requisites	Mechanics (203-NYA-05), Calculus I (201-NYA-05)
Co-requisites	Calculus II (201-NYB-05)
Ponderation	3-2-3 (3 hours of lecture, 2 hours of labs, and 3 hours of work outside class for each 5 hours of class time)
Course objectives	<p>To analyze various situations or phenomena associated with waves, optics and modern physics using basic principles. This course is intended to introduce the student to a broad range of physical phenomena involving waves (mechanical waves, sound waves, and electromagnetic waves), geometrical and physical optics, matter waves, and quantum physics.</p> <p>Detailed information regarding the objectives and standards for this course and the specific performance criteria is available at https://www.dawsoncollege.qc.ca/physics/program-documents/science/.</p>
Course competencies	<p>This course will allow the student to fully achieve the competency:</p> <p>OOOUT: Analyze various situations or phenomena associated with waves, optics and modern physics using basic principles.</p> <ol style="list-style-type: none">1. Apply the basic principles of physics to the description of vibrations and waves and their transmission.2. Apply the laws of geometric optics.3. Apply the characteristics of waves to light phenomena.4. Analyze a number of situations using concepts of modern physics.5. Verify experimentally a number of laws and principles associated with waves, optics and modern physics.
Evaluation	<p>The Institutional Student Evaluation Policy (ISEP) is designed to promote equitable and effective evaluation of student learning and is therefore a crucial policy to read and understand. The policy describes the rights and obligations of students, faculty, departments, programs, and the College administration with regard to evaluation in all your courses, including grade reviews and resolution of academic grievance. ISEP is available on the Dawson website.</p>

There are two grading schemes. **Your final grade will be the higher of the two schemes.**

Assignments, quizzes and class tests ^y	45%	30%
Laboratory activities	15%	15%
Final examination	40%	55%

^yYour teacher will provide a detailed breakdown of these components and a tentative test schedule during the first week of class.

In order to pass the course, students must show a basic understanding of the course material at the level covered in the lectures and in the lab. This is achieved by attaining a final grade of at least 60%, calculated according to the evaluation scheme above. **Note: course work not submitted by the due date may be penalized at the teacher's discretion.**

Reference materials

1. **Physics for Scientists and Engineers (with Enhanced WebAssign) by Serway & Jewett, 9th edition** or **Physics for Scientists and Engineers (with Mastering Physics) by Knight, 4th edition**. Custom packages for Dawson College NYC are available at the bookstore which include an access code for the online homework system. Your teacher will tell you which textbook will be used in your section.
2. **Library copies:** Copies of the textbook are available on reserve in the Dawson Library.

Teaching methods

The material will be presented using a mix of active learning activities, lectures, in-class problem solving, laboratory experiments and demonstrations. Laboratory periods will be used for experiments as well as class tests and lectures.

Attendance & participation

Although class attendance is not compulsory, students should make every effort to attend all classes. In the event that a class is missed, the student is responsible for all material covered or assigned during that class. **Attendance during laboratory experiments and for class tests is however compulsory.** In the rare event that a student for valid reason (*e.g.* due to an intensive course, illness, *etc.*) is or anticipates to be absent during a laboratory experiment or for a class test, the student **must**, where possible, inform the teacher and provide the necessary documents before the absence or, at the latest, on the day of their return. If the absence is excused, students will have the opportunity to complete the assessment.

All other assessments (readings, quizzes, lab activities, *etc.*) missed due to absence are:

- assigned a grade of zero where the absence is not excused;
- given zero weight in the calculation of the final grade where the absence is excused.

For additional information regarding attendance, students should refer to the Institutional Student Evaluation Policy3(the)iOISEPur secti K,nC[(es.)]TJ/F18 9.9626 Tf -81.963 -2832 0 Td [(matalic-)]TJ 0 -118.09335(st

**Course
content**

The material to be covered is contained in the following chapters and sections of **Physics for Scientists and Engineers by Serway & Jewett, 9th edition**.

Weeks	Topics	Chapter & Section
1{2	Periodic motion	Ch.15: 1{5 (physical pendulum optional); sections 6 and 7 qualitatively (quantitative optional for 6, 7)
2{4	Mechanical waves	Ch.16: 1{5 (6 optional)
4{6	Sound waves and hearing	Ch.17: 1 and 2 qualitatively; 3, 4
6{7	Superposition and standing waves	Ch.18: 1{5, 7; 8 qualitatively
8	Electromagnetic waves	Ch.34: 7 (EM spectrum)
8	Nature and propagation of light	Ch.35: all; Ch.38: 6 qualitatively
9	Interference	Ch.37: 1{5
10	Diffraction	Ch.38: 1, 2 (intensity optional), 3, 4 without derivations
11	Relativity	Ch.39: 1, 3, 4, 7, 8 (2, 5, 6 optional)
12{13		