

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

Teachers	Cecilia La Mela 7A.10, local 4476 clamel a@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	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. Detailed information regarding the objectives and standards for this course and the speci c performance criteria is available at https://www.dawsoncollege.qc.ca/physics/program-documents/science/.		
Course competencies	<ul> <li>This course will allow the student to fully achieve the competency:</li> <li>OOUT: Analyze various situations or phenomena associated with waves, optics and modern physics using basic principles.</li> <li>1. Apply the basic principles of physics to the description of vibrations and waves and their transmission.</li> <li>2. Apply the laws of geometric optics.</li> <li>3. Apply the characteristics of waves to light phenomena.</li> <li>4. Analyze a number of situations using concepts of modern physics.</li> <li>5. Verify experimentally a number of laws and principles associated with waves, optics and modern physics.</li> </ul>		
Evaluation	The Institutional Student Evaluation Policy (ISEP) is designed to promote equitable and e ective evalua- tion 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.		
	There are two grading schemes. Your nal grade will be the higher of the two schemes.		
	Assignments, quizzes and class testsy45%30%Laboratory activities15%15%Final examination40%55%		
	<sup>y</sup> Your teacher will provide a detailed breakdown of these components and a tentative test schedule during the rst 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 nal 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	<ol> <li>Physics for Scientists and Engineers (with Enhanced WebAssign) by Serway &amp; 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.</li> <li>Library copies: Copies of the textbook are available on reserve in the Dawson Library.</li> </ol>		

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

Attendance & Although class attendance is not compulsory, students should make every e ort 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 nal grade where the absence is excused.

For additional information regarding attendance, students should refer to the Institutional Student Evaluation Policy (ISEP section IV-C).

- Literacy It is expected that students will be able to comprehend the course material and express themselves appropriately as a normal part of their academic performance in the course. Marks may be deducted for inadequate communication skills.
- Laboratory work Experimentation is an essential part of science. Students will be expected to perform experiments and report on their results. Your teacher will provide you with instructions for lab experiments and activities (there is no manual to purchase). Students must be present during the entire lab activity to receive credit.

Student Everyone has the right to a safe and non-violent environment. Students are obliged to conduct themselves as stated in the Student Code of Conduct and in the ISEP section on the roles and responsibilities of students (ISEP section II-D). Disruptions or excessive noise will not be tolerated. Students who do not comply with these rules will be asked to leave the class and may be referred to Student's Services for disciplinary action. Mutual respect is the key to a harmonious learning environment.

Academic<br/>integrityCheating, copying, or any other form of academic dishonesty will not be tolerated. Students should<br/>acquaint themselves with the policy of the College on plagiarism and cheating. According to ISEP, the<br/>teacher is required to report to the Sector De86(th89a6(themsi6d4o(th89a6(thehe)-4.f(th89ted.)es)-3Tred)-346(plinndarstotheh887(c)278(heatTite),48a7(will)4317(b)-29(a)448aeh384(zero)4830(fot)]TJ 0 -11.956 Td 7(the)1423ieardfeworftinth1423(parIn)1(e)-1or<br/>Fmismerareatelach(t.)-843(Y)84(our)1383(teac7(hIn)1(e)-rof)-333ia6(th1421(erf))-1(m)-430(y)28(ou)1317(of)-338(ar

Course content

The material to be covered is contained in the following chapters and sections of **Physics for Scientists** and **Engineers by Knight**, 4th edition.

Weeks	Topics	Chapter & Section
1	Oscillations	Ch.15: 1{6 (physical pendulum optional), 7{8
		(qualitatively)
2	Travelling waves	Ch.16: 1{3, 4 (optional), 5, 6 (qualitatively), 7{9
3	Superposition	Ch.17: 1{7
4	Wave optics	Ch.33: 1{7
5	Ray optics, Rayleigh's	Ch.34: 1{3 Ch.35: 5{6
	Criterion	
5	Relativity	Ch.36: 3, 6, 7, 9 and 10 (1, 2, 4, 5, 8 optional)
6	Foundations of modern	Ch.37: 1, 2 (3{8 qualitatively)
	physics	
6	Quantization	Ch.38: 1{7
7	Wave functions and	Ch.39: 6 (optional)
	uncertainty	
7	Nuclear physics	Ch.42: 1{3, 5, 6 (4 and 7 optional)

**Comprehensive** Second-year students can opt to complete the independent study portion of their comprehensive examination nation in this course. (This option is not available in continuing education courses.) The project will be evaluated on pass or fail basis independently from the course grade.