



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

Teachers	Cecilia La Mela 7A.10, local 4476 clamel@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>OOOT: 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> <p>There are two grading schemes. Your final grade will be the higher of the two schemes.</p> <table><tr><td>Assignments, quizzes and class tests^y</td><td>45%</td><td>30%</td></tr><tr><td>Laboratory activities</td><td>15%</td><td>15%</td></tr><tr><td>Final examination</td><td>40%</td><td>55%</td></tr></table> <p>^yYour teacher will provide a detailed breakdown of these components and a tentative test schedule during the first week of class.</p> <p>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.</p>	Assignments, quizzes and class tests ^y	45%	30%	Laboratory activities	15%	15%	Final examination	40%	55%
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Reference materials	<ol style="list-style-type: none">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.									

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 Criterion	Ch.34: 1{3 Ch.35: 5{6
5	Relativity	Ch.36: 3, 6, 7, 9 and 10 (1, 2, 4, 5, 8 optional)
6	Foundations of modern physics	Ch.37: 1, 2 (3{8 qualitatively)
6	Quantization	Ch.38: 1{7
7	Wave functions and uncertainty	Ch.39: 6 (optional)
7	Nuclear physics	Ch.42: 1{3, 5, 6 (4 and 7 optional)

Comprehensive examination Second-year students can opt to complete the independent study portion of their comprehensive examination 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.