

**PHYSICS**  
**Science**  
**Engineering Physics**  
203-BZE-05 (all sections)  
Fall 2013

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<b>Teacher</b>	<b>Jonathon Sumner</b> 7A.24, local 1751, <a href="mailto:jsumner@place.dawsoncollege.qc.ca">jsumner@place.dawsoncollege.qc.ca</a>
<b>Pre-requisites</b>	Mechanics (203-NYA-05)
<b>Co-requisites</b>	Calculus II (201-NYB-05)
<b>Ponderation</b>	3-2-3 (3 hours of lecture, 2 hours of labs, and 3 hours of work outside class per week)
<b>Course objectives</b>	<p>The objectives are to analyze different physical situations and phenomena of interest to engineers and scientists using the fundamental laws of mechanics and to use computers to model various phenomena and to gather data in pertinent experiments. This course is designed to provide students with an enhanced background in mechanics.</p> <p>For detailed information regarding the objectives of this course and the specific performance criteria see the Science Program Description folder on FirstClass.</p>
<b>Course competencies</b>	<p>This course will allow the student to fully achieve the competency:</p> <p>OOUV: To analyze different physical situations and phenomena of interest to engineers and scientists using the fundamental laws of mechanics and to use computers to model various phenomena and to gather data in pertinent experiments.</p> <ol style="list-style-type: none"> <li>1. To analyze a wide variety of rotational phenomena using the concepts of dynamics and energy</li> <li>2. To analyze problems in fluid statics and dynamics</li> <li>3. To analyze problems in static equilibrium in two- and three-dimensions.</li> <li>4. To analyze the behavior of materials under tensile and compressive loads.</li> <li>5. To analyze and solve problems involving beams under a variety of loading conditions</li> <li>6. To analyze the internal stresses and strains in beams under a variety of loading conditions.</li> <li>7. To gain enhanced proficiency in the use of computers in a scientific context.</li> </ol> <p>This course also contributes to the partial achievement the competency:</p> <p>OOUU: To apply what the students have learned to one or more subjects in the sciences.</p> <ol style="list-style-type: none"> <li>1. To identify the scientific aspects of a given topic from an interdisciplinary perspective</li> <li>2. To transfer what they have learned to situations requiring the contribution of more than one discipline</li> <li>3. To apply systematically an experimental method</li> <li>4. To solve problems</li> <li>5. To use data processing technologies</li> <li>6. To reason with rigor</li> <li>7. To communicate clearly and precisely</li> <li>8. To show evidence of independent learning in the choice of documentation or laboratory instruments</li> <li>9. To work as members of a team</li> <li>10. To make connections between science, technology and the evolution of society</li> <li>11. To identify the underlying values underlying their treatment of a topic</li> <li>12. To place scientific concepts used in a historical context</li> <li>13. To show attitudes appropriate for scientific work</li> <li>14. To apply acquired knowledge and skills to new situations</li> </ol>
<b>Evaluation</b>	<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 marking schemes. **Your final mark will be the higher of the two schemes.**

Assignments, quizzes and class tests	50	25
Laboratory activities	25	25
Final examination	25	50

Your teacher will provide a tentative test schedule during the first week of class. To help you prepare for the final exam, old exam questions and solutions will be made available.

Students must show a basic understanding of the course material at the level covered in the lectures and laboratory in order to pass the course. This is achieved by attaining at least an average grade of 60%, calculated according to the evaluation scheme above. **Course work not submitted by the due date may be penalized at the teachers discretion.**

#### Reference materials

The textbooks are available in the bookstore, online, and you may be able to buy them used.

1. **University Physics** by Young & Freedman, 13th edition
2. **Structural Mechanics** by Hulse & Cain, 2nd edition

#### 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 at laboratory experiments and tests is compulsory.** Students must write the tests at the scheduled times except for unforeseen emergencies confirmed by proper documents. For additional information students should refer to the Institutional Student Evaluation Policy (ISEP section III-C) regarding attendance.

#### Literacy standards

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). Information about lab report formats is available in the Science Student Handbook which is available on FirstClass (see folder in 'student info' conference). **Students must be present during the entire lab activity to receive credit.**

#### Student conduct

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 integrity

Cheating, copying, or any other form of academic dishonesty will not be tolerated. Students should acquaint themselves with the policy of the College on plagiarism and cheating. According to ISEP, the teacher is required to report to the Sector Dean all cases of cheating and plagiarism affecting a students grade (ISEP section IV-C). The usual penalty for the first instance of cheating will be a grade of zero for the piece of work in question to all parties involved (under certain circumstances, even a first offence may be penalized by failure in the course). A second offence may result in the failure of the course. Students should note that using someone elses laboratory data without authorization from the student and the teacher is cheating.

#### Intensive course conflicts

If a student is attending an intensive course, the student must inform the teacher, within the first two weeks of class, of the specific dates of any anticipated absences.

**Policy on religious observance**

Students who intend to observe religious holidays must inform their teachers in writing as prescribed in the ISEP Policy on Religious Observance (ISEP Section III-D), within the first two weeks of the semester. Forms for this purpose are available from your teacher. Your teacher will inform you of any modifications to planned course activities resulting from the teacher's own religious commitments.

**Course content**

The material to be covered is contained in the following chapters and sections of the texts.

Weeks	Topics	Chapter & Section
0	Review: Linear momentum of a system of particles; centre of mass	Y&F Ch.8: 2, 5
1-2	Kinetic energy of a rigid body, rolling, conservation of mechanical energy	Y&F Ch.9: All sections
3	Conservation of angular momentum for a system of particles	Y&F Ch.10: 1, 4-6
4	Newton's laws of motion for rotation	Y&F Ch.10: 2, 3
5-6	Hydrostatics: pressure, buoyancy, applied forces	Y&F Ch.12: 1-3
7-8	Fluid dynamics: conservation of mass and energy	Y&F Ch.12: 4, 5
9	Intro to structural mechanics; static equilibrium	Y&F Ch.11: 1-3; H&C Ch.2: All sections
10	Analysis of pin-jointed frames	–
11	Trusses	H&C Ch.3: All sections
12	Beam analysis	H&C Ch.4: All sections
13	Intro to stress analysis	H&C Ch.5: All sections
14	Stresses in beams	H&C Ch.6 & 8: All sections
15	Beam design	–

**Comprehensive assessment**

Students can opt for an independent study project as part of their comprehensive evaluation. This would count for 10% of the student's final grade, while the usual course mark would count for 90%. However, only second-year students are eligible to do their comprehensive evaluation in the course. Students who choose this option must notify their teachers by the due date.

**Questions outside class**

- All teachers will be available in their respective offices to their students during posted office hours. In the first week, your teacher will inform you of their schedule and will post it outside their office.
- Room 7A.1 is a physics study room. At scheduled times, a teacher or peer tutor will be on duty there to answer your questions. The schedule of teachers and peer tutors will be posted outside of 7A.1 in the 2nd or 3rd week of term.
- Many teachers in the Science Program – including those from the Physics Department – will communicate with their students via FirstClass. This software allows teachers and students to share information, use email and much more. You can download the necessary (free) software at the following website:

<http://www.place.dawsoncollege.qc.ca>

An instruction manual is available at this website that details how to install and use the software.