



PHYSICS
Science
Engineering Physics
203-BZE-05 (all sections)
Fall 2017

Teacher	Jean-Francois Briere 7A.16, local 4013, jfbriere@dawsoncollege.qc.ca
Pre-requisites	Mechanics (203-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 per week)
Course objectives	<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>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>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">1. To analyze a wide variety of rotational phenomena using the concepts of dynamics and energy2. To analyze problems in fluid statics and dynamics3. To analyze problems in static equilibrium in two- and three-dimensions.4. To analyze the behavior of materials under tensile and compressive loads.5. To analyze and solve problems involving beams under a variety of loading conditions6. To analyze the internal stresses and strains in beams under a variety of loading conditions.7. To gain enhanced proficiency in the use of computers in a scientific context. <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">1. To identify the scientific aspects of a given topic from an interdisciplinary perspective2. To transfer what they have learned to situations requiring the contribution of more than one discipline3. To apply systematically an experimental method4. To solve problems5. To use data processing technologies6. To reason with rigor7. To communicate clearly and precisely8. To show evidence of independent learning in the choice of documentation or laboratory instruments9. To work as members of a team10. To make connections between science, technology and the evolution of society11. To identify the underlying values underlying their treatment of a topic12. To place scientific concepts used in a historical context13. To show attitudes appropriate for scientific work14. To apply acquired knowledge and skills to new situations
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	50%	30%
Laboratory activities	20%	20%
Final examination	30%	50%

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

Intensive course contacts

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 IV-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	Pages
1	Properties of a system of particles; centre of mass	From <i>Mechanics</i> textbook
2-5	Rotational dynamics of a rigid body	From <i>Mechanics</i> textbook
6	Intro to structural mechanics	156{168, 170{176, 180{183
7	Trusses, frames and machines	185{204
8	Static equilibrium in 3D	209{215, 217{222
9	Internal loads and stresses	225{228, 230{239
10	Axial strain and thermal deformations	248{253, 255{262
11	Shear force and bending moment diagrams	267{272, 274{281, 284{289
12	Bending and shearing stresses in beams	293{299, 301{304
13	Intro to fluid mechanics: density, pressure, forces	73{87
14	Buoyancy	93{104
15	Fluid dynamics	113{128

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.

Questions outside class

All regular day program 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 the physics study room. At scheduled times, a teacher or peer tutor will be on duty there to answer your questions. The Tutoring Center is located in room 7A.1 in the second floor of the Science Center.