PHYSICS
Science
Engineering Physics
203-BZE-05 (all sections)
Fall 2018

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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

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.

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/.

Course competencies

This course will allow the student to partially achieve the competency:
00UV: Apply the experimental method in a scientific field.

1. Represent various situations, drawing upon relevant concepts, laws and principles of science.
2. Solve problems using a method proper to science.
3. Apply techniques of experimentation or validation specific to science.

Evaluation

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.

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

Assignments, quizzes and class tests[y]	50%	25%
Laboratory activities	25%	25%
Final examination	25%	50%

[y] Your 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.

Required materials A coursepack is available at the Bookstore.

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 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.

Course content

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

Weeks	Topics	Pages
1	Intro to structural mechanics	From *Coursepack* p. 4{32
2	Trusses, frames and machines	p. 33{56
3	Static equilibrium in 3D	p. 57{72
4	Internal loads and stresses	p. 73{92
5	Axial strain	p. 96{107
6	Shear force and bending moment diagrams	p. 115{131
7	Bending and shearing stresses in beams	p. 132{159
8	Properties of a system of particles; centre of mass	From *University Physics, OpenStax* Ch. 9, sections 1{6
9-12	Rotational dynamics of a rigid body	Ch 10 all sections, Ch 11 sections 1{3
13	Intro to uid mechanics: density, pressure, forces	Ch. 14 sections 1, 2
14	Buoyancy	Ch. 14 section 4
15	Fluid dynamics	Ch. 14 sections 5, 6

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.